Hypermeter

and

Performers' Choices

in Recordings of

J. S. Bach's Toccata in F, BWV 540/1

by

Leon W. Couch III, D.M.A., Ph.D.

Abstract

Hypermeter and Performers' Choices in Recordings of J. S. Bach's Toccata, BWV 540/1

Despite its 3/8 meter designation, J. S. Bach's Toccata in F Major conveys the impression of a compound meter through its somewhat regular two-, four-, and perhaps eight-bar groupings. Well regarded performers respond differently to passages where these hypermetrical patterns shift, become less strongly defined, or have strongly opposing accentual patterns. This paper provides possible explanations for the intuitive solutions in their interpretations.

Many performers confirm and/or play against these implicit musical structures. Others shift between these two approaches. A few early-music performers musically thwart the perception of a hypermeter by deliberately using stronger metrical accents. Towards the end of the paper, this study will suggest a subtlety new interpretation for the second pedal solo not yet present in current recordings. Despite all the differences in interpretations above, all of the strategies can yield compelling performances, as demonstrated in cited performances of BWV 540/1.

While explaining interpretations of the second pedal solo, this paper also provides performers with additional information for deciding how to adapt the solo to shorter pedal compasses often found on historic organs. Of the two eighteenth-century solutions outlined by Peter Williams in *The Organ Music of J. S. Bach*, only one preserves a recognizable four-bar hypermeter, motive, and a good sense of melodic climax. The less radical cut—which modern performers use more frequently on limited pedal boards—maintains a more balanced form (in terms of measures) but is faulty in these other aspects of musical design.

Because some early-music experts vociferously object to this sort of "modern" analysis, this paper spends more time justifying its methodology than most theorists require: It clearly demonstrates hypermetric passages before proceeding. In particular, I will show that the *tutti* theme and many canonic passages, for the most part, strictly conform to a strong-weak pattern of Baroque dance, in which each four-bar unit starts with a strong measure and ends with a weak-measure cadence. In some passages, an eight-bar hypermeter is plausible.

Ultimately, this sort of analysis can help performers decide on effective interpretive strategies. In BWV 540/1 in particular, such an approach also helps performers decide which measures to play, when forced to rearrange the work for historical instruments. (No composer manuscript exists.) In sum, the hypermetric analysis of current recordings provides important insights into how this masterwork is and can be played.

Introduction

In his famous treatise *Die Kunst des reinen Satzes in der Musik*, J. S. Bach's student Johann Kirnberger (1721–83) remarks that composers sometimes replace proper time signatures with convenient ones:

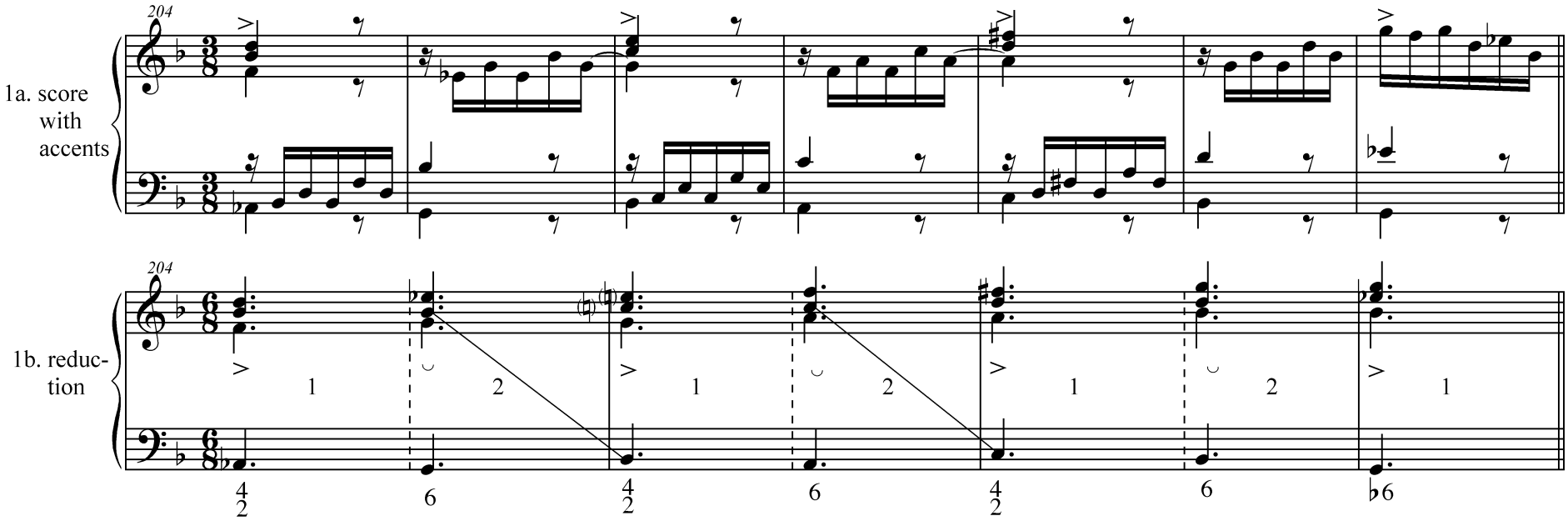
> These compound meters are not to be confused with [those found in] pieces where only one barline is written every two measures [e.g., 6/8] simply to avoid an excess of barlines, but which in other respects completely retain the nature of simple meters [e.g., 3/8].[1]

The Toccata in F Major, BWV 540/1, presents the opposite scenario with an essentially 6/8 meter notated in 3/8. Relatively recently, music theorists have dubbed such regular hierarchical patterns of strong and weak measures as "hypermeter."[2]

In most passages, the strong and weak bars of the toccata seemingly function as dotted-quarter-note beats of a perceptible 6/8 meter. Measures 204–209 (Example 1a), for instance, clearly present a two-bar hypermeter: > u | > u | > u. (The accent > represents strong measures, u weak measures, and | hyperbars.) As heard at 3:42 in Karl Richter's recording, the dissonant dominant-$^{4}_{2}$ chords resolve to metrically weaker 6/3 chords (Example 1b); that is, the sevenths in the bass operate as unprepared suspensions, clearly defining the strong measures. Most recordings reflect these musical structures. They can be most easily heard in faster tempi taken by Joan Lippincott, Richter, and others.

Toccata in F, BWV 540/1

Example 1: Clear 2-bar hypermeter in mm. 204–10 (Rit 1c')



Legend

>	strong measure
⌣	weak measure
1, 2 , ...	measures in hyperbars

Some performers further help the listener by lengthening the hypermetric downbeats and often deemphasizing 3/8 metrical accents. As Kirnberger states,

> there are melodies in which it is obvious that whole measures are alternately strong and weak, so that a whole measure is heard as only one beat. If the melody is of such a nature that the entire measures is felt as only one beat, two measures must be grouped together to form just one, whose first part is accented and the other is unaccented.[3]

Not acknowledging this phenomenon would result in a monotonous succession of accented downbeats—an effect "as unpleasant as a sentence in speech consisting entirely of one-syllable words, each of which had an accent."[4] After all, the sensation of meter requires strong and weak beats, and a pure succession downbeats lacks a true sense of meter.

Unlike metrical accents, hypermetric organization can be more fluid and fleeting than the hierarchical accentuation patterns of notated meters. (Musical notation does not coerce composers into strictly maintaining patterns beyond the measure level.) As a result, tracking the hypermeter in many Baroque genres, if even applicable, can be especially difficult and may even involve the performer negotiating changes in accentuation to aid the listener. Often not familiar with the term "hypermeter" and less accustomed to applying such concepts to Baroque music, performers of Baroque music are often loathe use "classical phrasing" on Baroque music.[5] Afterall, the only historic evidence directly applicable to the Toccata in F major occurs in Peter Williams's report of slurs in some musical sources for the toccata.[6] (This will be discussed in greater detail when the pedal solos are discussed.)

With Kirnberger's remarks in mind, the musical structures of BWV 540/1 strongly suggest a two-bar or longer measure groupings nearly throughout. As in much art music, the patterning of BWV 540/1 occasionally shifts or becomes confused by cross accents—a potential

problem or opportunity for the performer and the listener.

Literature Review and Need for this Study

Without comment anywhere in their survey of J. S. Bach's dance-like music, Meredith Little and Natalie Jenne list BWV 540/1 as a "Gigue II-like" work with a 3/8 meter signature.[7] The toccata certainly fulfills most of their criteria for this dance type:

> 1. One, two, or four ternary beats per measure in 3/8, 6/8, or 12/8, with duple subdivision of ternary figures, *usually with an upbeat*[8] [Italics mine]
> 2. Affect joyful and intense
> 3. Jigging rhythms . . . [9]
> 4. Long phrases with few caesuras
> 5. Dance-like lilt or character[10]

Marking each measure as a beat in their figure X-5 of stereotypical gigging rhythms, they essentially diagram a two-, four-, and even eight-bar hypermeter through their analytical brackets and terminology "*arsis-thesis*".[11] If their assertion about BWV 540/1 is correct, the most important implications of their "gigue" designation to this study are (1) a four-bar hypermeter divided into equal two-bar units nearly throughout, (2) an upbeat measure for the *tutti* melody, (3) a lively character, (4) a brisk tempo, and (5) cadences commonly occurring on the last measure of each four-bar unit.

Except in keyboard suites, where dances physically suggest measure groupings, many musicians are less accustomed to applying "classical" hypermeter to German Baroque music. *Fortspinnung* and the resulting irregular phrase lengths in contrapuntal genres, afterall, rarely allow for its obvious operation. But, in *ritornello* movements from Bach's Weimar period (works influenced by Italian concerto style), four- and two-bar groupings are found more commonly:

> The over-all similarities the ritornello constructions of the first movements are curiously similar [in BWV 564, 916, and 829]. Their ritornellos are four-measure units leading to decisive cadences: in the organ work [Toccata in C, BWV 564] a two-measure unit is immediately given a modified repetition.[12]

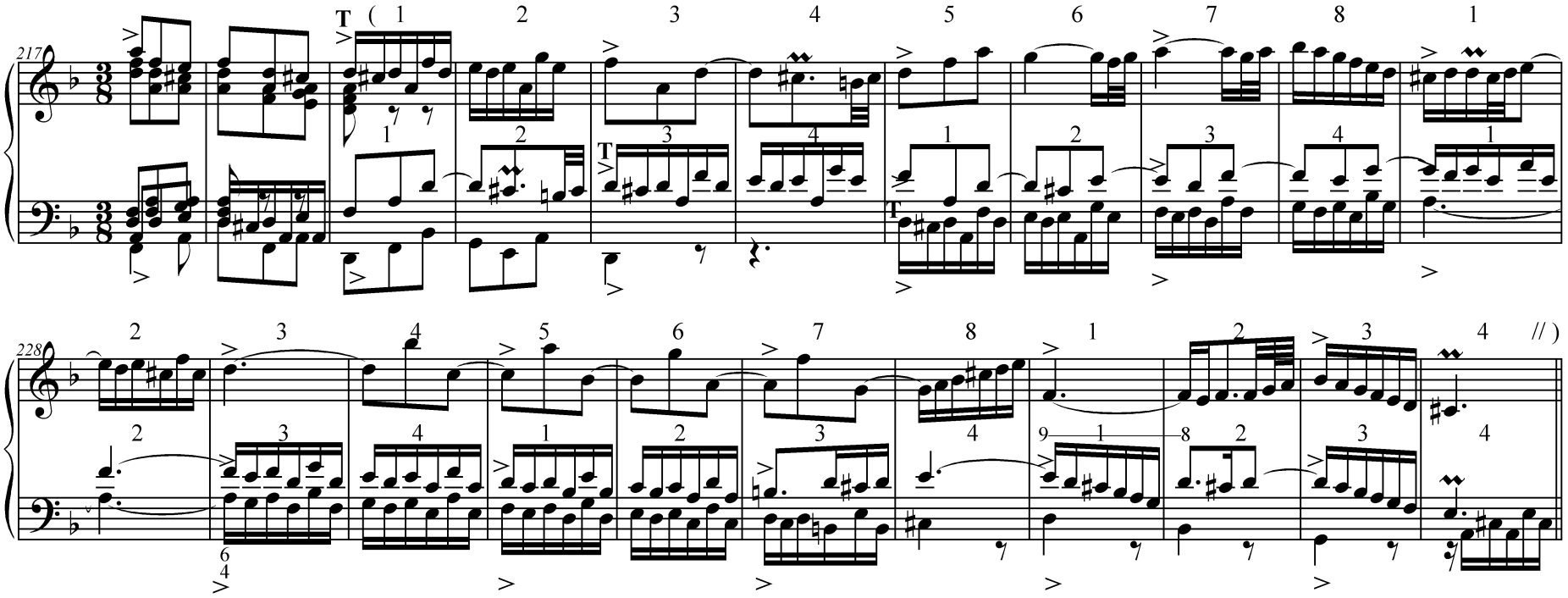
Henry Eickhoff, quoted above, also observes this phenomena in the *Praeambulum* of Partita V (BWV 829): "Here again the ritornello is a four-measure structure, a two-measure unit with varied repetition, closing with an imperfect cadence."[13]

More recently, a few significant music-theory dissertations and articles have finally begun to investigate hypermeter in specific high-Baroque genres. In his pioneering article, Channon Willner primarily examines Bach's English and French suites, where more regular two- and four-bar groupings are expected.[14] But, he also tracks down the complications of two- and four-bar hypermeter in the fourth Brandenburg concerto, with some important implications for performances of that specific work—an Italian connection useful for BWV 540/1. In his recent dissertation, Willner examines hypermeter in Baroque orchestral works by Handel.[15] Using Lerdahl and Jackendoff's approaches as well as Schachter-style Schenkerian analysis,[16] Mauro Botelho's dissertation provides perhaps the most theoretical and historical underpinnings for studies of hypermeter in Bach's music, and he provides thorough analyses of Bach's concerti.[17]

But, these authors address neither Bach's organ music nor pragmatic applications of their approaches to performances as presented in this article. Thus, even a resourceful, scholarly organist is left with only older studies of toccata-ritornello forms during Weimar and Cöthen periods (Eickhoff and others); however, these do not directly employ the concept of hypermeter. (To verify the *ritornello* form of BWV 540/1 and locate passages under discussion in this paper, see Diagram 1.) The silence about this aspect leaves the performer relying solely upon Peter Williams's problematic motivic treatment of BWV 540/1 as a basis for measure grouping. No

Example 2: Clear 2-, 4-, or 8-bar hypermeter in *concertino*, mm. 217–238 (Solo 1)

score with analysis



Legend

T Canon theme

Toccata in F, BWV 540

Diagram 1: Form

Mm.	1	5 5	8 3	1 1 3 6 7 9	1* 1 2 2 7 9 0 1 7 7 4 0	2 1 9	2* 2 3 6 9 3	2 7 1	2* 3 3 3 9 1 1 2 1 1 8 4	3 3 3	3* 3 3 3 3 4 4 4 4 5 6 7 8 9 1 2 3 3 3 7 5 2 4 7 4 0 8
Sect.	Introduction				Ritornello Form						
Sub.	M_1	P_1	M_2	P_2 -	R_1	S_1	R_2	S_2	R_3	S_3	R_4 (Bb ped.) (F ped.) (C ped. . . . . .)
Mot.	a	a (b)	a	a b	c b c' a'	a	c b	a	c b c' a'	a	c b+a b c c" b c' a' (b)
Key	I———~~~›V		V———		~~~~~~~~~~~~›	vi—–	~~~~~~›	iii—–	~~~~~~~~~~~~›	ii—–	~~ IV———~~~~~› V———~~~~~~› I
Cad.	PAC		IAC		EC	PAC †	HC	PAC †	HC	EC	PAC † HC PAC EC PAC
Hyp.	**2**, 4, 8	**2**, 4, 8	**2**, 4, 8	**2**, 4, 8	**2**, **4**, 8 / **2**, 4, **8** / **2** / **2**, 4, 8	**2**, 4, 8	**2**, **4**, 8 / **2**	**2**, 4, 8	**2**, **4**, 8 / **2** 4 8 / **2** / **2**	**2**, 4, 8	**2**, **4** **8**-bar hypermeter 2? **2** **2** **2**
Eff.	Establish norm		Disturb patterns		Dramatic shape	Relief	drama	relief	drama	relief	resolution of issue expansion, "recap", closure

Legend

Subsection

M_x	manual canons
P_x	pedal solo
R_x	ritornello
S_x	solo

Theme / Motive

a	solo theme
a'	solo theme, head motive
b	detached chords
c	tutti theme (arpeggiation and stepwise descent)
c'	tutti theme, head motive (with $^{4}_{2}$-6 progression)

Cadence

PAC	perfect authentic cadence
IAC	imperfect authentic cadence
EC / DC	evaded cadence
HC	half cadence

Hypermetric dissonance

- clear hypermeter
- unambiguous w/skips
- obscured w/cross accents
- ambiguous
- not present

2, 4, 8 — possible hyperbar lengths; most prominent boldfaced

* Ritornello sections begin with a lead-in on the previous measure

† If one begins the *concertini* one to two measures earlier before the points of imitation, an IAC will occur in S_1 and S_3

studies of hypermeter in toccata-ritornello forms of Bach's organ music currently exist.

For this reason, this paper first examines clearly established hypermeter in BWV 540/1 prior to identifying several significant passages with aurally ambiguous hypermeter. It then shows several solutions that current performers intuitively use to solve these problematic cases, as evidenced in current recordings (Table 1). All recordings cited in this paper exemplify different performers' hypermetric interpretations of the Toccata in F Major, BWV 540/1.

Sections with Clear and Unambiguous Hypermeter

In addition to the *ritornello* subsection cited in Example 1, several other musical sections establish and clearly remind the listener of the prevalent hypermetric organization. The *concertini* and the lengthy introductory sections play an important role in establishing hypermeter of BWV 540/1. Such frequent and/or prolonged sections encourage listeners to project a hypermeter upon more ambiguous passages. Performers also often respond to these musical structures.

As heard at 4:38 in Bernard Lagacé's recording, Example 2 displays three possible measure groupings (2-, 4-, and 8-bar) in the recurring *concertini*; their accentuation patterns are completely in agreement. The *concertino* theme ("T") enters on strong measures in the soprano in m. 219, in alto in m. 221, and in the bass in m. 223. All three strands of the imitative counterpoint agree in their two-bar accentuation patterns (Example 2), and dissonance treatment and harmonic prolongations reinforce a four- as well as two-bar hypermeter: The pedal point on A3 arrives on the hypermetric downbeat in m. 227, and the "cadential" $\frac{6}{4}$ occurs properly on a strong measure in m. 229. The two-bar scheme continues through the suspension chain and

continues naturally until the arrival of the tonic harmony in m. 235. Here a 9-8 suspension occurs in the alto voice over one two-bar hypermeasure. (Suspensions occur on and clearly define strong beats in tonal music.) Two-bar grouping can clearly be perceived, whether or not the performer wishes the listener to do so.

As indicated between the staves in Example 2, a four-bar hypermeter can also be perceived at the beginning of the passage and, if desired, continued throughout. Some performers and listeners might attempt an eight-bar grouping as indicated above the staves. (I will later discuss the significance of eight-bar attempts to the *tutti* themes.) In all of these putative hypermeters, the *concertino* ends on a weak-beat cadence in m. 238. (This fact will be somewhat significant for conclusions about *tutti* sections later in this paper.)

The hypermetric organization is also encouraged by the physical motions required by the passage and thus usually heard through duration and articulation on hypermetric downbeats in most recordings. As shown in Table 1, the vast majority of performers not only allow for a hypermetric listening but encourage it during these passages. Lagacé's performance, for instance, beautifully demonstrates the musical results of implicit physical gestures in the score.

As heard in John Butt's recording, however, an especially skilled and detail-oriented performer may work very hard to prevent the listener from hearing the hypermeter too obviously. Butt carefully creates 3/8 metrical accents with equal emphasis of downbeats from measure to measure; Butt is one of the few who truly conveys current ideas of fastidious Baroque metric hierarchies of current performance practice. Still, because of his tempo, the listener can easily overlay the expectation of two-bar hypermeter.

For similar reasons, the introductory canons immediately establish a 2-, 4-, and possibly

Table 1: Recorded Performances of Toccata in F, BWV 540/1

Artist	Year	Len.	Pace	Hyper	Can.	Ped.	Shift?	Cut?	Rit-a	Rit-b	Rit-c	Soli
Biggs	1974	9:22	slow	no. 3/8	No!	2-	shift, runs into 6/4	No	impl.	2-	2-	no.
Bowyer	2005	8:19	fast	3/8?	no.	2- accents	shift clear, runs into 6/4	No	4-	2-	2-	2-
Butt	2000	8:30	fast	3/8?	no interp.	3/8!	no interp.	No	3/8, impl.	2- impl.	2- impl.	3/8 but 2- impl.
Couch	2005	8:17	fast	2-	2-	2-,4-	?	No	4- w/lift	2-	2-	2-
Fagius	1994	8:53	mod.	2-bar	6/8	2-	shift clear	Yes	2-, 4- shifted?	2-	2-	2-
Herrick	1990	8:40	mod.	2-bar	6/8	2-bar clear	shift	No	4-	2-	2-	2-
Jacob	1999	9:10	slow	3/8	no. 3/8?	?	No?	No	2-bar	2- impl.	2-	2-, 4-
Kibbie	2007	8:25	mod. fast	impl.	impl 1 3/8 in 2	starts 3/8, then 2	shifts gradually	No	2-	2-	2-	2- mostly
Koopman	1999	8:13	mod. fast	2-bar	impl.	2-bar clear	shift clear, runs into 6/4	No	4-	2-, 7->8?	2-	impl.
Kraus	?	8:10	mod.	3/8?	2-	2-	shift	No	4-	2-	2-	impl.
Lagacé	2006	9:33	mod. slow	6/8	2-	2-	shift, wait before 6/4	No	4-	2-	2-	2- in S3

Lippincott	1997	7:55	very fast	2-,4-bar	2-, 4-	4-bar 1st, 2-bar 2nd	no. cross accents	No	cross accents	2-	2-	2-
Marshall	2001	8:20	mod. fast	no. 3/8	no.	2-,4-	shift.	No	2-, 4-	2-	2-	2-, 4-?
Murray	1980	8:16	mod.	2-bar	impl.	2-bar imp	no interp.	No	impl.	2-	2-	?
Richter	(2005)	8:04	fast	2-,4-bar		4-bar?	?	No	4-	2-	2-	2-
Rubsam	1995	10:27	slow	no. 3/8	no.	2-bar slight	shift, wait before 6/4	No	2-, shifted, m. 367	2- impl.	2- impl.	2-
Schrader	1996	8:10	fast	2-bar	no interp.	2-	shift clear	No	4- w/man. changes	2-	2-	2-
Stroganov	2003	8:34	mod. slow	2-,4-bar	2-	4-bar	shift, wait before 6/4	No	4->6	2-, stretch 8 bar?	2-	2-, 4-? w/lift
Tillmanns	2001	10:18	very slow	no. 3/8	no, 3/8	? 2- or 3/8	no interp.	No	no. 3/8	no. 3/8	no. 3/8	no. 3/8
Vad	2006	9:11	mod. fast	6/8	6/8	2-	shift clear, runs into 6/4	No	4-, shifted, m. 367	2-	2-	2-
Van Oortmerssen	2007	9:59	slow	6/8	2-, 4-	2-	shift clear, runs into 6/4	No	impl.	2-	2-	2-
Vertnet	2000	7:47	fast	4-bar?	2-, 4-	1st: 4- 2nd: 2-	shift clear, runs into 6/4	No	4-, cross accent	2-	2-	2-
Walcha	(1995) 1959	9:30	slow	6/8	6/8	2-	shift, runs into 6/4	No	4-	2-, 7->8	2-	?

Legend

Meter & Hypermeter

2-	2-bar grouping
4-	4-bar grouping
8-	8-bar grouping
3/8	accents of 3/8 meter (no hyp.)
6/8	accents of 6/8 meter (2-bar)
no interp.	no regular accents
implicit	listener can perceive

Ritornello, theme a

4->6	accents make 4-bar sound like 6-bar
cross accents	real and shadow hypermeter projected
shifted	shadow meter in upper voice emphasized
367	doesn't readjust hyperbars at m. 367

Ritornello, theme b

7->8	*rubato* makes 7-bar sound like 8-bar

Pedal solo

shift	shadow hypermeter emphasized
run into	approach to 6/4 in time
wait	readjust hyperbars before 6/4

Pace = perceived speed due to numerous musical factors, including tempo

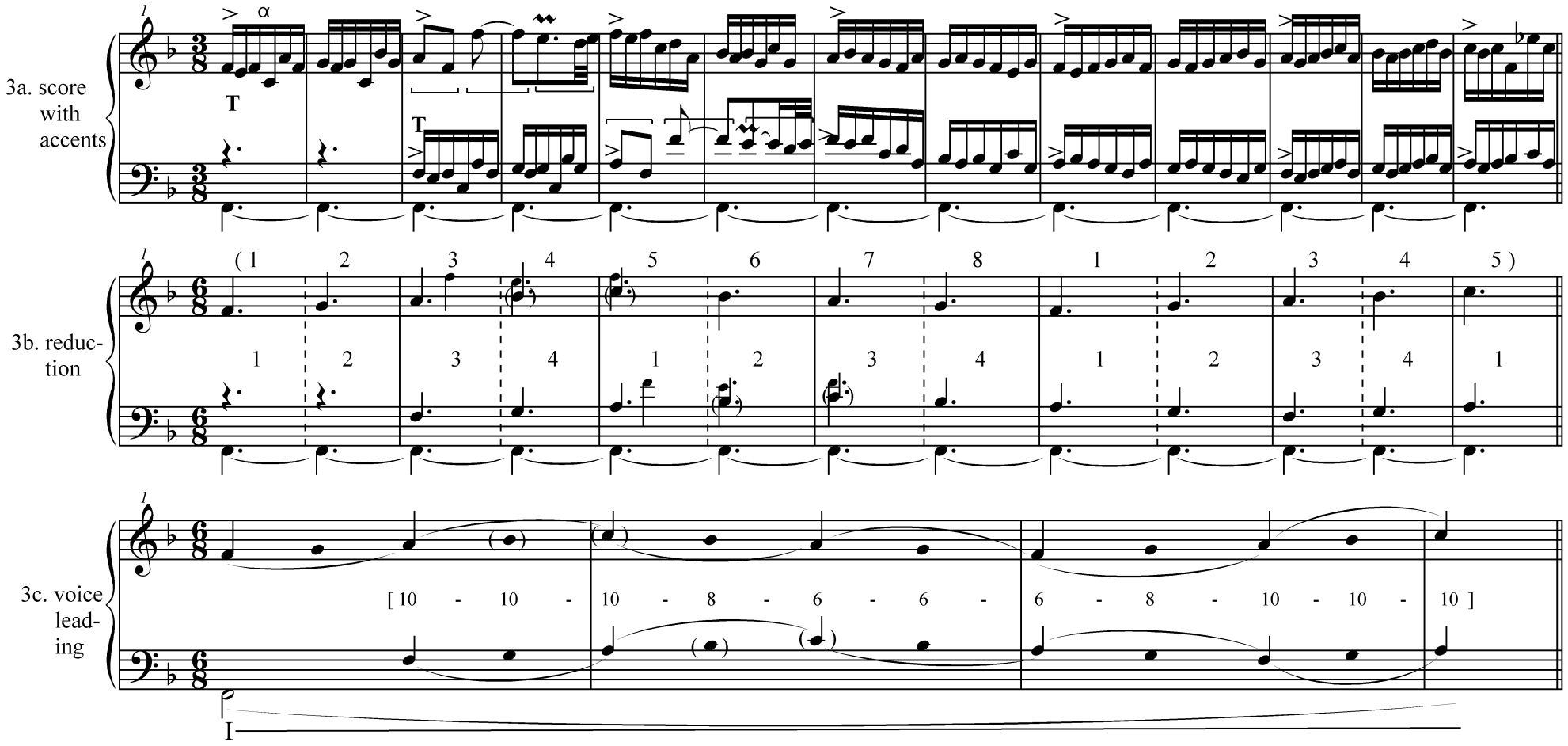
8-bar hypermeter as the norm for the toccata. In mm. 1–4 (Example 3a), the hypermetric accentuation is clearly > u | > u.[18] The *dux* and *comes* imitate at two bars distance, and their melodic accentuations agree with each other (unlike in the more problematic *tutti* canons to be discussed later).[19]

Furthermore, the structure of the canonic theme itself establishes a hypermeter. Functioning as a motivically enriched passing tone connecting pitches of the tonic chord, the second bar constitutes a weak measure. (See F - G - A in mm. 1–3 of Example 3c.) The recurring pattern of structural tones (strong) and passing tones (weak) in both canonic voices throughout the passage creates a 6/8 (or 12/8) meter with a strong expectation of continuation throughout the toccata. One might also observe that changes in the motivic patterns generally occur on strong measures every two bars, further strengthening the perception of these two-bar strong-weak units. The *concertino* theme incidentally is clearly based on this canonic theme. (Compare the music scores of Examples 2 and 3a.)

A skilled listener might perceive—and a determined performer might project—a somewhat regular four-bar hypermeter in BWV 540/1, because the larger-scale changes in figuration occur every four bars: mm. 1–4 presents the "theme" of the introduction, mm. 5–8 contain motivic filler, mm. 9–12 proceed with an ascending linear progression, and mm. 13–16 present the next thematic point of imitation.[20] (See Example 3b.) Faster performances can make it easier to perceive larger measure groupings. In fact, a listener might even consider an eight-bar hypermeter, although it is fleeting here. A performer would find it difficult to consciously convey it.

These passages clearly contain musical structures that imply a hypermeter, whether a

Example 3: Unambiguous 2-, 4-, or 8-bar hypermeter in mm. 1–4 (Canon 1)



Legend

⌒ prolongation
⌣ surface hemiola (in one voice only)
( ) implied pitch
α head motive of canonic theme

performer chooses to convey, ignore, or obscure it. As previously mentioned, few recordings actively prevent the listener from perceiving larger-scale grouping. The hypermeter, for instance, can be easily perceived in Lippincott's quick performance from 0:00 onwards. Once again, John Butt foregrounds the 3/8 metrical organization, making it more difficult to perceive larger measure groupings (0:00 onwards). E. Power Biggs also does not convey larger measure groupings, by playing especially slowly and keeping deliberately equal articulation focused on the beat level (0:00 onwards). As Jacques van Oortmerssen's recording demonstrates, incidentally, hypermetric accentuation can be clarified by the performer even in slow tempi (0:00 onwards).

In sum, the introductory manual canons establish clear hypermetric patterns with their theme and imitative structures, while the *concertino* sections clearly reestablish the hypermeter with a closely related theme. Such prolonged use of strong-weak patterns encourage both performers and listeners to interpret intervening passages as hypermetric, even when they are ambiguous or possibly not even present. In the next sections of this paper, we will examine how performers deal with this issue—the desire to continue patterning and to work out changes in patterning throughout a musical performance.

Confusing Passages—Opportunities for Performance Choices in BWV 540/1

Performers possess an intuitive sense of strong and weak measures, especially in music of the classical and later periods. Often simply by driving towards melodic highpoints ("tonic accents"[21]), observing harmonic and figural changes, making physical movements required by musical gestures, and acknowledging cadences, one intuitively discovers and often

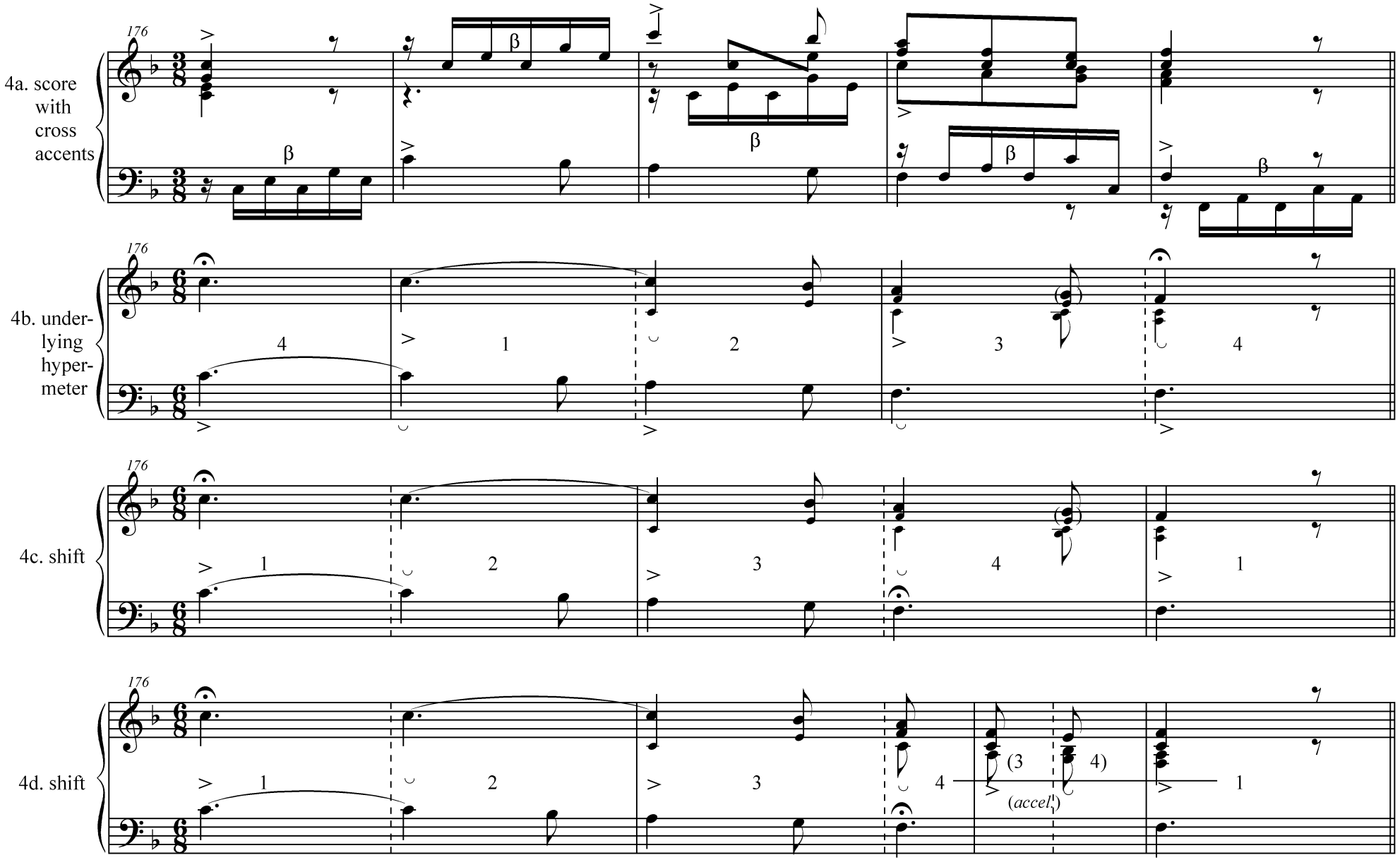
unconsciously communicates hypermetric accents. Whether or not the performer applies this same understanding to early music, competent listeners will normally recognize regular structural patterns.[22]

When more than one prominent melody occurs simultaneously (counterpoint), however, consistent measure groupings in each voice (if present) may not coincide, rendering the aggregate's hypermeter aurally ambiguous; i.e., more than one potential hypermetric scheme is available. The toccata, BWV 540, presents several seemingly ambiguous passages, in which upbeat and downbeat bars may be difficult for a lay person to discern. (Despite these conflicting cues, most listeners will continue their expectations and maintain a strong sense of a compound meter.)

As heard in nearly every recording (except Tillmann's), the regular pattern of strong and weak bars in the first *tutti* theme, mm. 176–180 (Example 4a), for instance, creates an obvious two-bar hypermeter. The trochaic accent pattern (Example 4b–4d), however, is ambiguous: > u | > u || > or u || > u | > u ||. Which measures constitute downbeats of a perceived 6/8 meter? Numerous schemes can be found in recordings, as indicated by the parallel lines (||) above and the numbers in between the staves in Examples 4b–4d. The regularity of this so-called "four-bar phrasing" in this subsection probably encourages listeners to truly perceive a four-bar hypermeter throughout the *tutti* sections.[23]

Whether or not one settles upon a two-, a four-, or eight-bar hypermeter, performers seem to disagree on which accent patterns to foreground for the listener. At 3:00, Oliver Vertnet plays the accents of the three rhythmic streams equally as shown by accent marks in Example 4a; such an approach theoretically may be perceived as "no interpretation" (Biggs) or better as "accents

Example 4: Obscured 2- or 4-bar hypermeter in the *tutti* theme, mm. 176–80 (Rit 1c)



Legend
β *tutti* head motive

and cross accents" (Vertnet), depending on subtle performance clues. At 3:15, Leon Couch follows the accent pattern in the bass shown in Example 4b. At 3:28, Knud Vad emphasizes the accent pattern of the soprano as in Example 4c; and, at 3:28, Hans Fagius creates the sensation of a strong-beat cadences as in Example 4d. Others, like James Kibbie, seem to vacillate between the solutions shown in Examples 4b and 4d: When the melodic line ascends with large block chords (mm. 246, 294, 302), Kibbie heavily accents the final measure of the four-measure group, somewhat like Example 4d; otherwise, he plays the first *ritornello* theme more according to Example 4b. (More results can be found in Table 1.)

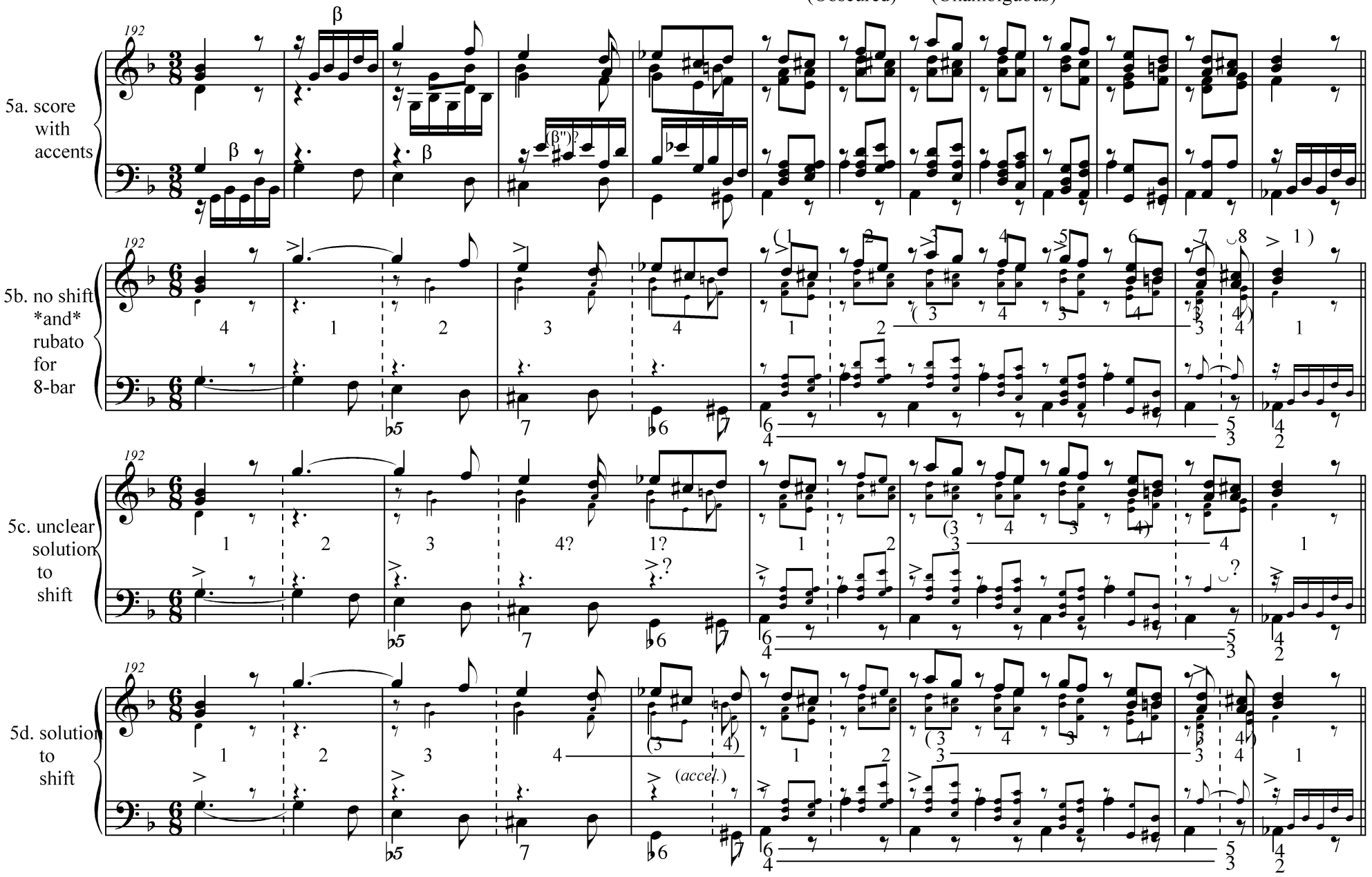
Common Performance Interpretations of the first *Tutti* Theme in Recordings

Unlike the canons at the time interval of two dotted-quarter notes, the first *tutti* theme enters in each voice on successive measures. As a result, the canonic bass and soprano voices of the *tutti* are thus out of phase; that is, the melodically stronger accents of bass occur when the soprano's weak accent occurs and visa versa (Example 4a). Although the pervasive two- or four-bar hypermeter invariably leads listeners to hear this passage in a compound meter, one must question which measures serve as strong and weak beats.

Some performers, such as Vad, focus on the soprano's high point in m. 178, resulting in the > u | > u || > pattern (Example 4c), starting in mm. 178 or 176. However, if one strictly maintains his strong-weak pattern throughout mm. 178–197 in this interpretation, the cadential $\frac{6}{4}$ of m. 197 arrives on a weak measure (Example 5c). Being a double suspension (6-5, 4-3), the cadential $\frac{6}{4}$ chord must define a strong measure; thereby, necessitating some stop-gap solution to make m. 197 a hypermetric downbeat.[24] One could, for instance, claim that both m. 196 and m.

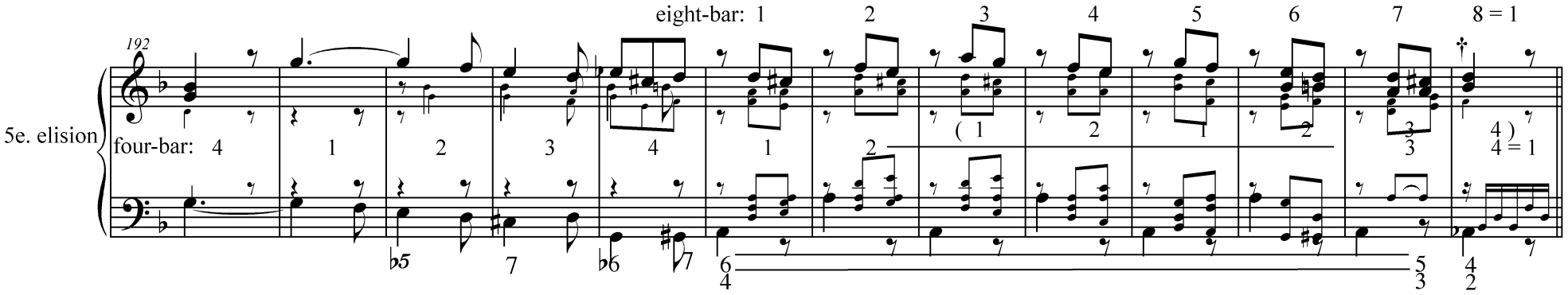
Example 5: Hypermetrical issues in mm. 195–197 and mm. 203–205 (Rit 1c & 1b)

(Obscured) (Unambiguous)



β *tutti* head motive

Example 5: Hypermetrical issues in mm. 195–197 and mm. 203–205 (continued)



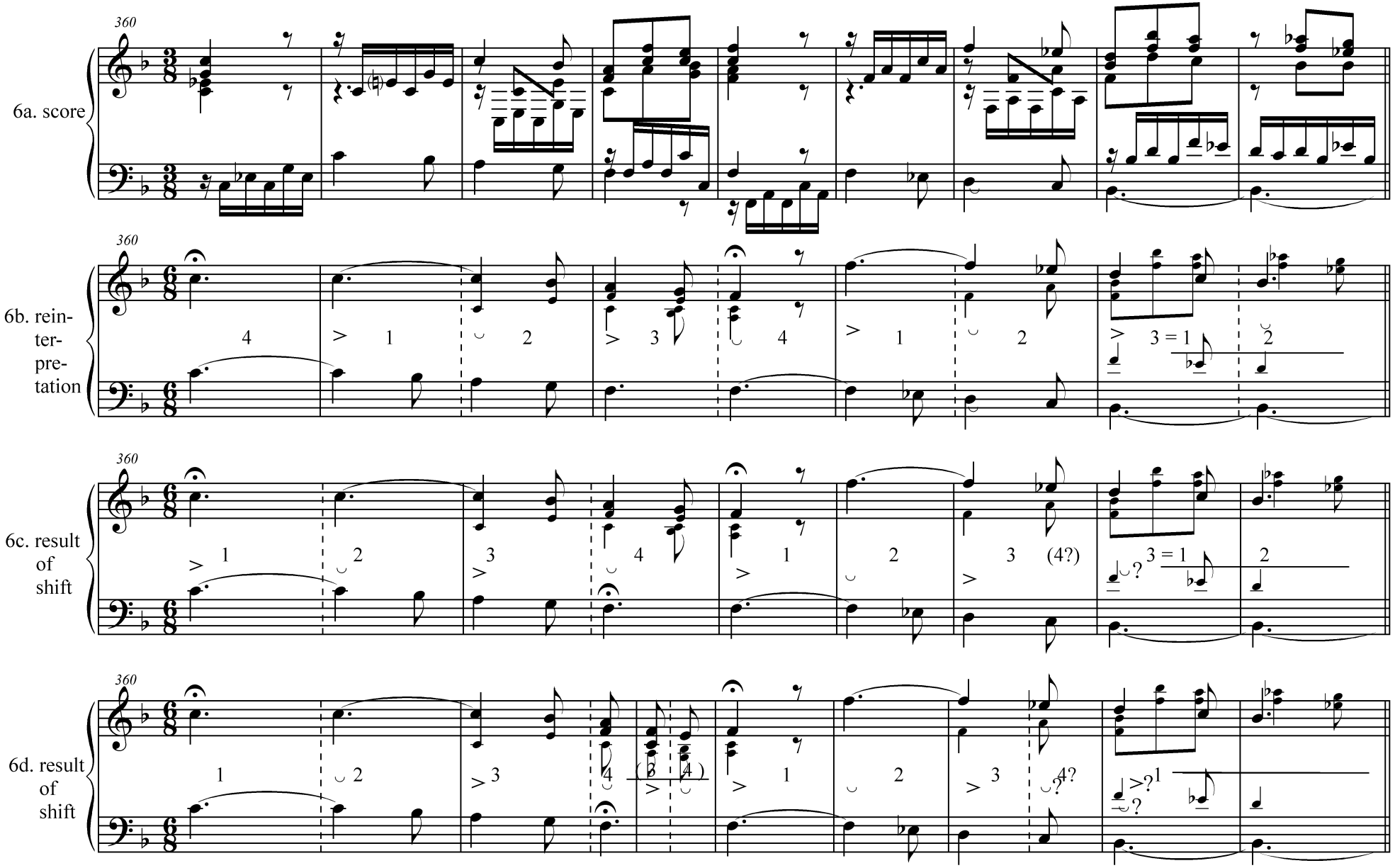
† elision of two hypermeasures

197 function as strong measures. To do this, a player must (1) purport an omitted weak measure (Example 5c), (2) attempt a prolongation of the fourth or third measures (Example 5c), (3) contrive two measures out of one (Example 5d), or (4) use elision to reinterpret a weak measure as a strong one (Example 5e). Example 5c can be heard in Vad's recording at 3:57. Example 5d can be heard in Fagius's recording at 3:46. Example 5b can be heard in Helmut Walcha's recording at 4:13.

Simply omitting a measure or using elision in m. 197 has a powerfully abrupt, but stilted, effect. A prolongation of the third measure inverts the strong-weak relationship associated with the arpeggiated head motive in the tenor, while a prolonged fourth measure cannot be justified harmonically. The contrivance in Example 5d however might be considered a written-out *accelerando* that uses the $\flat$II^6-vii^{o7}/V harmonies in m. 196. Although possible, this last attempt to justify two strong (written) measures detracts from regular pacing and also requires a slower pace and some extremely deliberate playing to be perceived.[25]

The interpretations that begin the *tutti* theme with a strong measure[26] (rather than a lead-in) creates even worse "trouble" in m. 367, where a weak measure would then initiate a significant subdominant arrival (Example 6c), as in Vad's recording at 7:27. As Example 6c–6d demonstrates, this problem cannot be easily solved. Although discussion of this juncture will be found later in the paper, one can see that any solution privileging strong accents in the soprano above those in the bass results in a (perhaps usefully) difficult or inconsistent reading of the *tutti* theme. One can hear Example 6d in Fagius at 7:14. (Example 6c, as heard in Kevin Bowyer at 6:48 and others, will be discussed later.) Here, at m. 367, any of the above interpretation schemes using strong measures on m. 176 or 178 utterly fail. Revealing the underlying

Example 6: Hypermetrical issues in m. 367 (Rit 4c & 4b)
(Unambiguous)



hypermeter here can provide for an interesting "working out" of the accentual problem earlier in some performances.

Performances reflecting the Hypermeter for the first *Tutti* Theme

As heard in Walcha's recording, starting instead with a trochaic (> u) hypermetric pattern in m. 177 (Example 4b) presents an easier solution with a steady strong-weak pattern: He drives steadily ahead and arrives on the cadential $\frac{6}{4}$ in m. 197 with a strong measure, without any needed manipulation of accents. Also, the problem of arriving on a strong measure in m. 367 conveniently disappears without any need to rework the *tutti* accent patterns (Example 6b), as heard in Bowyer's recording. In retrospect, the listener may think of the "ambiguous" *tutti* theme as starting with an off-beat lead-in in the bass with cross accents in the soprano.[27] (The inner voice entry also subtly reinforces the accent scheme of the bass.) A few performers, such as Vertnet, actually promote this listening.

As a result of a trochaic pattern beginning in m. 177, each four-bar unit terminates with a weak-measure cadence (see m. 180 in Example 4b). These weak-measure cadences in the *tutti* repeatedly lift the music onwards to the subsequent phrases,[28] rather than dramatically closing each four-bar unit with a more terminal strong-measure cadence (found frequently in performances with the "troublesome" hypermetric scheme starting on m. 176). This musical "lift" seems especially appropriate when four-bar units end with major chords, which subsequently become dominants to succeeding harmonies, as in mm. 180 and 188.[29] The weak-beat cadence also partially explains the strong forward drive throughout *tutti* melody.

One may also recall that Bach established a clear two- or four-bar hypermeter for the

scale C to F in the introductory canons. Although embellished, the same strong-weak accentuation on measures containing the descending scale from C to F seen most clearly in Example 3c (soprano mm. 5–8 and tenor mm. 7–10) is especially significant. The first *tutti* theme is based upon this same scale (Example 4). This underlying structural parallelism may not be as obvious to the listener nor the performer, but gives strong musical evidence for this interpretation (strong measures starting in m. 177).

Performers' Solutions for the second *Tutti* Theme

With either interpretation (starting strong/weak hypermeasures in either m. 177 or m. 178), one must deal with the fact that dominant prolongation in mm. 197–203 (Example 5a) has an odd number of measures; i.e., two strong written measures abruptly occur in a row. This surface "disruption" of the hypermeter appropriately accompanies the dramatic crash into a sequential passage of $\frac{4}{2}$–6 chords and into quickly introduced accidentals—this seems intentional on the part of the composer. The pervasive recognition of this hypermetric disruption in most recordings augments the striking musical effect in m. 204.[30]

If one truly wishes to maintain an unswerving strong-weak accent pattern in performance, however, a few players (esp. in slower recordings) may play the chords in m. 203 emphatically to give the impression of two bars compressed into one written bar for the $\frac{6}{4}$–$\frac{5}{3}$ resolution (Example 5b). In fact, Walcha clearly adds a measure with *rubato* in his performance at 4:13—a student hearing his recording would dictate eight bars instead of the seven found in the score. Such a regularization of hypermeter takes especially deliberate effort on the performer's part and recalls the common performance interpretation of the *tutti* theme c.

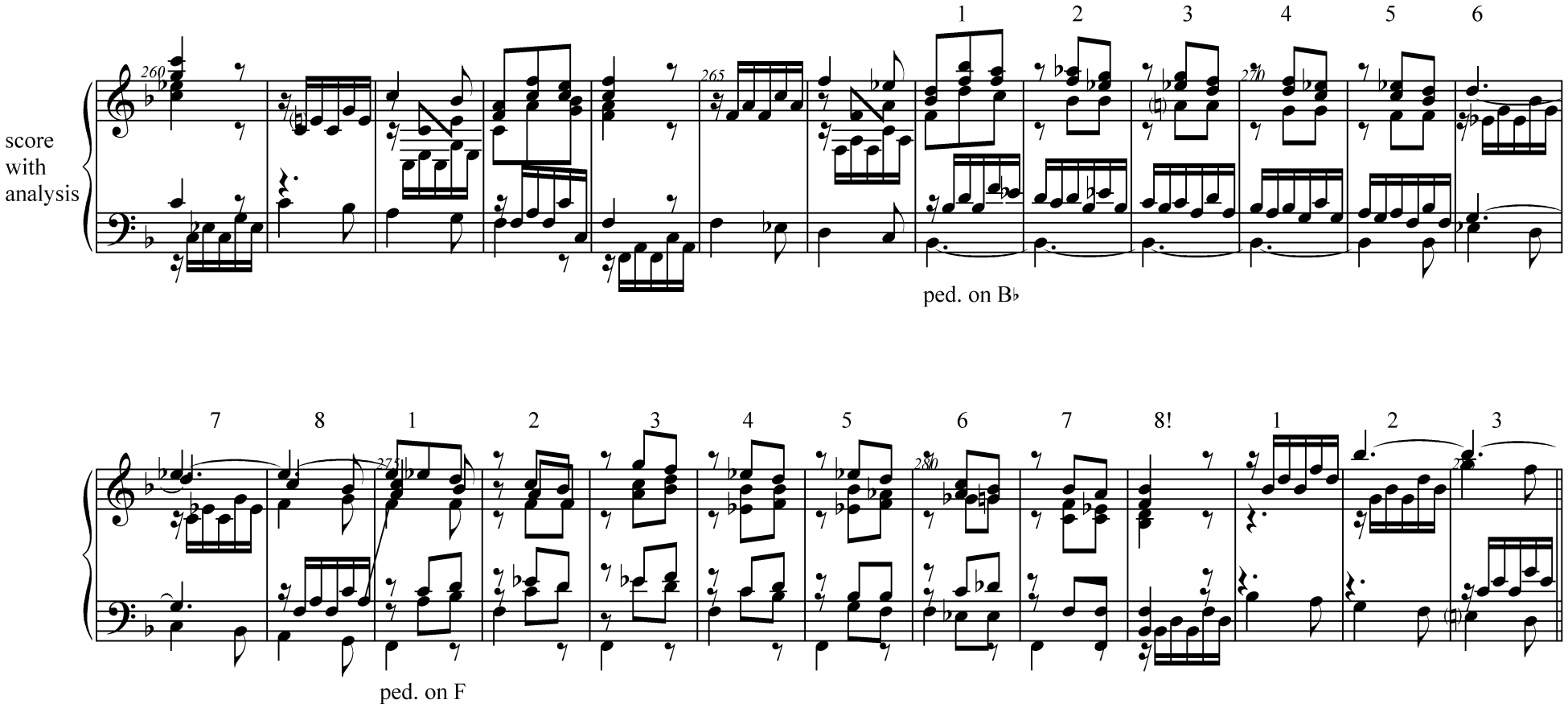
A more easily executed solution involves elision with the preceding eight-bar phrase and the next one (Example 5e); as a phrase overlap, m. 204 is shared—after all, an explicit eight-bar version of theme b occurs towards the end in mm. 375–82 (shown later in Example 7). Nevertheless, the abrupt arrival wonderfully magnifies the effect of the dissonant $\frac{4}{2}$ harmony; and, this is what the performer needs to emphasize. The only performer to truly communicate an elision (Example 5e) is Kimberly Marshall at 3:35. Most take advantage of the drama of two strong bars in a row.

The initial ambiguity created by a canon at the time interval of one dotted quarter certainly piques listeners' attention. Listeners feel the dilemma of choosing between competing hypermetric schemes (Examples 4a or 4d) or of even attempting to hear both simultaneously. This dilemma resurfaces in every *tutti* statement and provides forward motion. Vertnet and several others leaves this dilemma up to the listener. Ultimately, however, one must conclude in retrospect that only one of the two seemingly putative hypermetric schemes is logically possible. The foregrounding of cross accents earlier on can yield an interesting conflict to be resolved later, while some performers will prefer to bring out the underlying structures with cross accents placed within. This latter approach overthrows a useful rule of thumb in which the highest sounding pitches determine arrival points and strong measures.

Interpretations that Thwart the Rhythmic Structure in the first *Tutti* Theme

As previously discussed, some performers wish to drive towards the melodic highpoint of the soprano voice in the *tutti* theme, rather than the bass, and attempt to place hypermetric-like accentuations there as well. Such an approach leads to several interesting solutions that demand

Example 7: Hypermetrical issue resolved in clear 8-bar units in mm. 367–82 (Rit 4c & 4b+a)



great effort of the performer and potentially can add drama to the work.

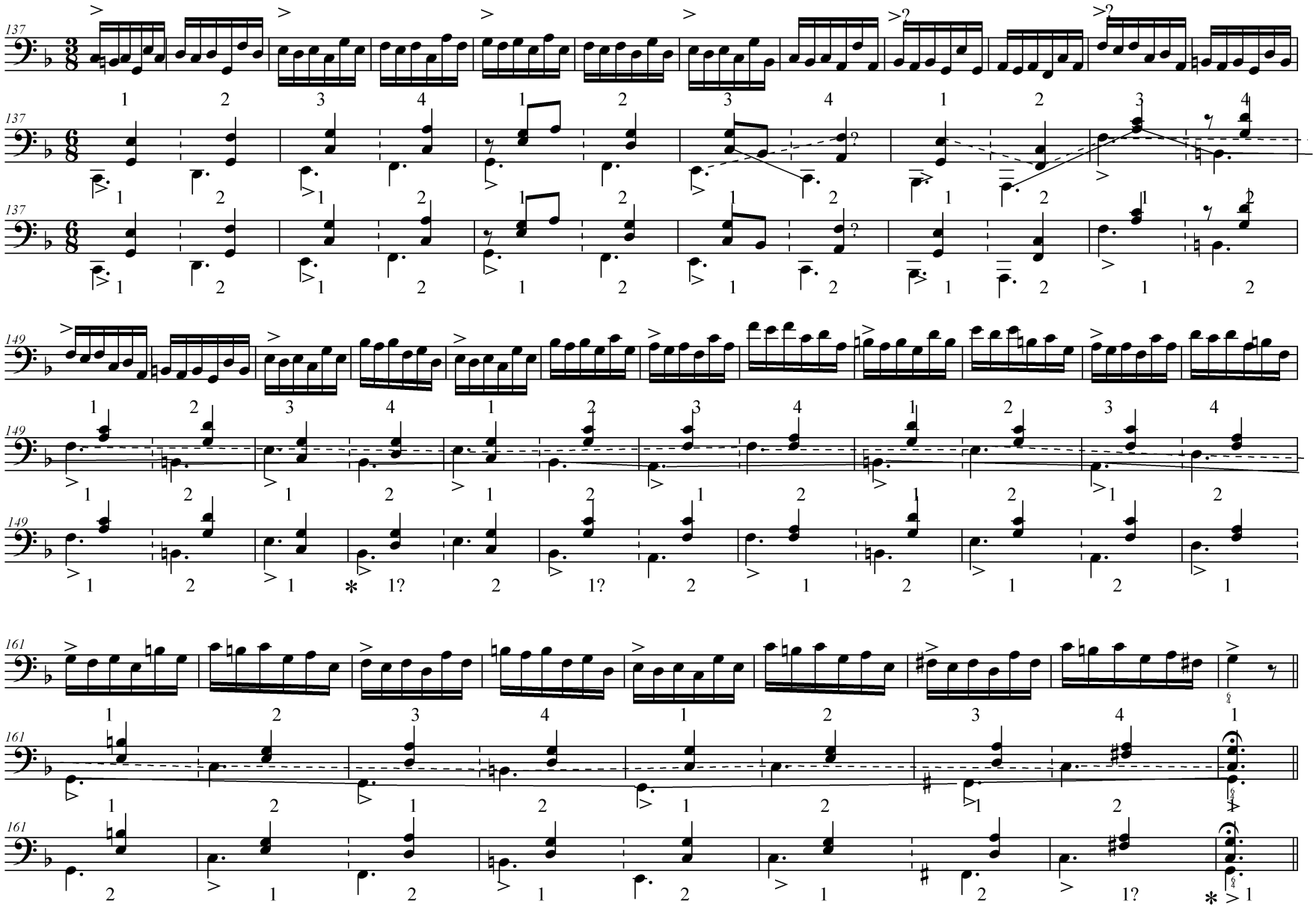
One may attempt to play three compressed measures in m. 179, one for each dramatic chord (Example 4d), as implied in Fagius at 3:28. Such an interpretation makes the four-bar theme seemingly represent six bars: > u | > u | > u. To me, this sudden written-out *accelerando* at the end of this repetitious theme deviates too far from the evenly paced and strong motoric drive of BWV540/1, and it somewhat subverts the four-bar organization normally applied throughout the toccata.[31] Nevertheless, strong accents (*marcato*) on chords such as those in m. 179 can be employed to good effect in order to suggest this solution, assuming agogic accents in the right hand do not compromise the sixteenths in the left hand (β' head motive). Furthermore, this solution parallels the interpretive techniques employed in the alternate solution to the dominant prolongation in mm. 192–205 (Example 5d), heard in Fagius at 3:46.

This proposed alternative, however, leads to difficulty again in m. 367 (Example 6c), as heard in Vad at 3:47. Here, once again, an important prolonged harmony, the subdominant, arrives on the "weak" measure of the normal *tutti* melody (according to the alternate solution). Such an arrival requires a strong metrical accentuation, thereby necessitating reworking of the hypermetric patterns in m. 366 (Example 6d), as in Fagius's recording. Perhaps showing the listeners that they have been tricked, the listeners and performer would be required to hear the same *tutti* theme differently at this point. (No parallel passage in this toccata parallels this reworking of the interior of the *tutti* theme, but such awkward "landings" can be easily found in commercially available recordings.)

One might instead rework m. 367 in order to follow the approach to the end of previous *tutti* themes (two measures represented by one written measure in m. 367), but this "repair"

Toccata in F, BWV 540/1

Example 8: Hypermetric accentuations in second pedal solo, mm. 137–69
(Concentrating on problematic area, mm. 151–170)



first implied voice - - - - - - - - second implied voice

* potential location of change in strong-weak hypermetrical pattern required by competing interpretation

disrupts the arrival of the subdominant prolongation and also contradicts the expansive effect of the pedal point. At this point, instead, performer sometimes "reveals" the underlying structure to the listener. Here, one must use the scheme proposed earlier (an one-bar lead-in) for a good arrival.

One might use the inherent ambiguity of the *tutti* theme: a performer might prefer hypermeasures with the arpeggiated figure and place metric accents on high pitches, when it works, and shift to hypermeasures with a one-bar lead-in that accents the pedals accent scheme, when the other accentuation pattern fails. Such an approach necessitates the elision of hypermeasures. (A practice I will discuss later under the second pedal solo.) This inconsistent reading of the *tutti* theme might be considered throughly "baroque" (misshapen) or perhaps tipping the balance here and there of an ambiguous theme.

These approaches require some highly deliberate playing at times, and, for some, may not match the even pacing some perceive in BWV 540/1 (i.e., relatively few elisions and skipped bars). But, these approaches can potentially be used to create a "compositional problem" worthy of working out by the end of the work. By R_4, the underlying hypermeter must prevail, because of clear markers of strong measures (pedal-point arrivals and cadential $\frac{6}{4}$ chords).

Performances of the Second Pedal Solo, mm. 137–69, with Shifting Accent Patterns

The changes in surface patterns within the second pedal solo, mm. 151–69 (Example 8a), give performers some interesting opportunities. In Example 8c at the asterisks, several performers change accents normally associated with the hypermetric downbeats in order to reflect the dramatic highpoints of the pedal solo.[32] (As organists, they elongate and/or articulate

these pitches strongly. Some use *rubato* as well.) One may hear this in many performances, including that by Feodor Stroganov at 2:37. This common approach requires two shifts in the accentuation pattern with two strong bars in a row. Where and should the shift occur? And, if so, where should one "shift back"? The minority, however, do not follow the surface figurations to avoid shifting accents (Example 8b); these few maintain an unswerving strong-weak patterns, despite the high pitches. Example 8b can be heard in Lippincott and in Couch at 2:31.

Whether the performer chooses to clarify or muddy the waters, a good understanding of such passages relies upon finding better defined areas. As with the *tutti* theme, the vast majority of performers routinely aim towards high points in the pedal solos: u > | u >. Both the large physical motions and the relatively high pitches of the second pedal solo, mm. 137–69 (Example 8a), suggests this approach—it is fun to play and to hear the shift of accentuation. Afterall, these simple but powerful interpretive criteria serve the performer well in the first pedal solo: Performer's measure groupings line up easily with the underlying hypermeter in the first solo. (In contrast, the accents in mm. 137–150 of the second pedal solo are at odds with the underlying groupings.)

While melodically emphasizing higher pitches ("tonic" accent) in mm. 151–168, performers often shift hypermetric accentuation (often accomplished through "agogic" accent). Many performers intuitively do this, especially by the time they arrive on the high F4 in m. 156. Performers who convey a compound-meter "lilt" and create the sensation of a hypermetric shift, once again, must choose (1) to contract a hypermeasure by omitting a strong or weak bar, or (2) to extend a hypermeasure with one bar of written music. One of several opportunities for this shift occurs at the asterisk in m. 153 of Example 8c.

A choice to shift hypermetric accentuation in m. 153 or other similar locations necessitates an abrupt return to the underlying hypermeter upon arriving on the strong cadential $\frac{6}{4}$ in m. 169, as clearly heard with the especially hard agogic accent in Stroganov at 2:37. (Otherwise, one arrives on a weak bar, despite the fact that the cadential $\frac{6}{4}$ chords unequivocally communicate a strong hypermetric accent.) It is not possible to extend the previous hypermeasure, as the pattern of strong measures on high notes has been rigorously established until the very arrival of the $\frac{6}{4}$ in these problematic interpretations. Placing two strong measures in a row in mm. 168–69 (omitting a weak bar or employing elision) would disrupt the steady flow of the pedal solo.

Examples 8b and 8c convey the sort of intuitive tracking of melodic lines and accentuation performers might do in these two general approaches; but, for a more persuasive, lilting performance evoking a fast dance-like compound meter, such choices and execution thereof in BWV 540/1 could be made better with some conscious analysis, as seen in later examples. Whatever the tempo, the recognition of strong and weak measures (hypermeter) makes a substantive difference in performances of the toccata, BWV 540/1.

Performances of the Second Pedal Solo, mm. 137–69, without a Shift

One can easily "solve" the above hypermetric problem of the second pedal solo, simply by maintaining an invariant strong-weak hypermetric scheme—the one established at the beginning of the solo (Example 8a). This solution accents hypermetric downbeats placed on the low notes with cross accents on high pitches (upbeats) for each two-bar group from m. 151

onwards, which seems counterintuitive to many performers. The simplicity and ease of this solution (Example 8b), however, suggests that it may be more consistent than the interpretations that change accentuation at the asterisks in Example 8c (unless one values an awkward return to reflecting the underlying structure at m. 169, such as in Stroganov at 2:37). A convincing performance of the straightforward interpretation in Example 8b can be heard in Lippincott's performance.

A cursory examination of the voice-leading in mm. 147–68 shows that harmonies proceed in two-measure groups (Example 8b), motivating the above hypermetric scheme despite the dramatic high pedal notes that occur on weak bars in mm. 151–168.[33] (Notice how two implied voices, marked with straight and dotted lines in Example 8b, move every two bars.) This fact more clearly supports the unswerving strong-weak hypermetric patterns in Example 8b in mm. 137–40 and mm. 151–69. As it turns out, playing these patterns in Example 8b is nearly as easy to perform as those in Example 8c, even though the groupings in Example 8b are not as readily apparent to a player accustomed to routinely driving towards high melodic notes. In addition to justifying its increased length and divergence from its model in the first pedal solo, J. S. Bach's choice to shift high pitches from strong to weak measures in m. 151 makes the second pedal solo much more engaging than the first solo. (Remember that the use of tonic accent against the hypermeter becomes useful to the *tutti*.)

I should mention incidentally that, although a four-bar hypermeter seems to conform perfectly to the number of measures in the musical passage, a performer's physical gestures here seem to reinforce a swinging two-bar hypermeter with the two-bar local harmonic prolongations (Examples 8a–8b). Nevertheless, a skilled performer could fairly easily communicate a four-bar

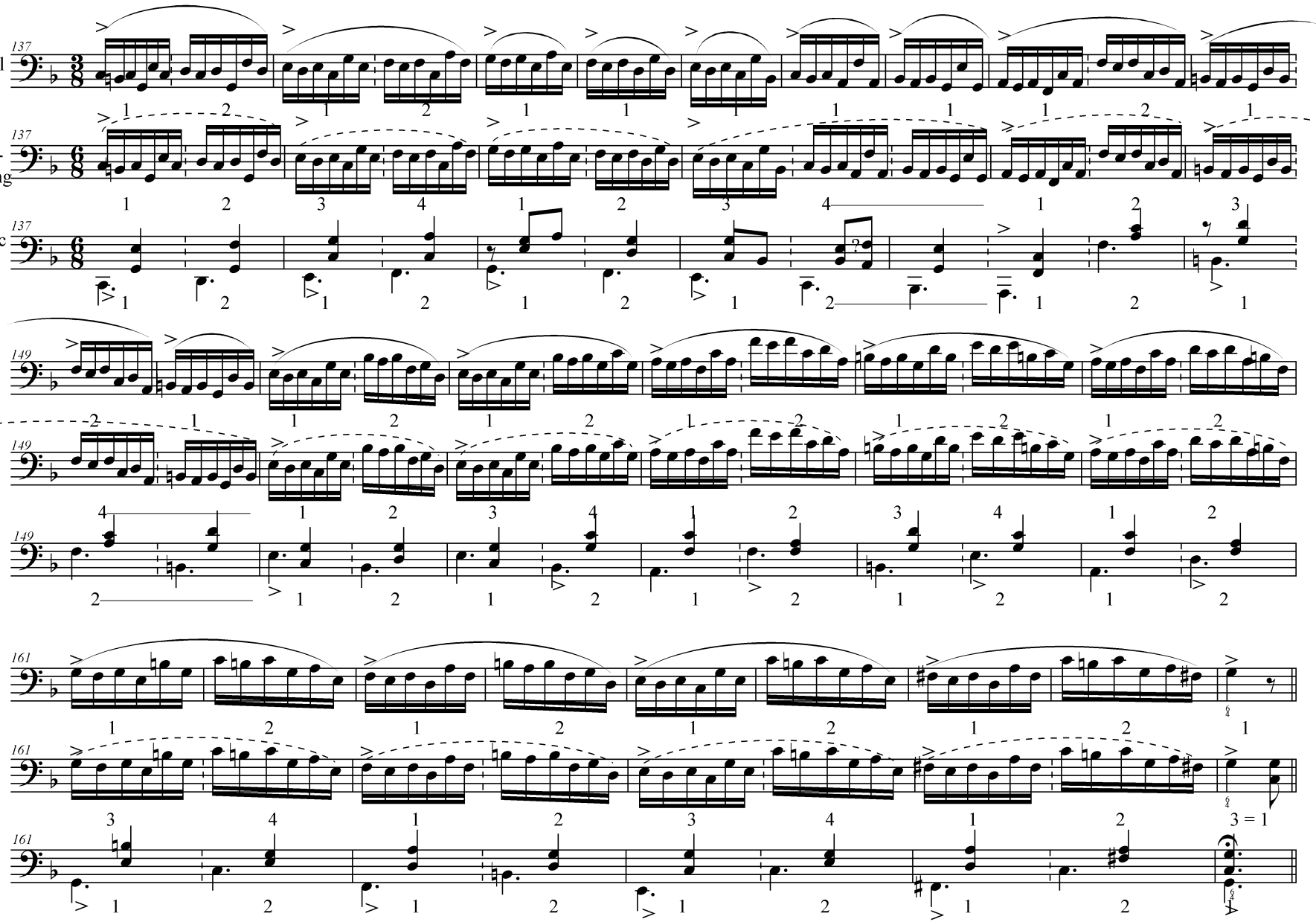
hypermeter proposed in Example 8a. Here, the listener could even perceive an eight-bar hypermeter! In currently available recordings, one does not find many performers obviously responding to four- or eight-bar hypermeters, despite the significance of these lengths later on in the body work—potential new interpretations. But, four-bar groupings can be heard easily in Vertnet's first pedal solo and possibly in the performances by Lippincott and by Stroganov.

Towards a New Interpretation of the Second Pedal Solo, mm. 137–69

Unfortunately for those who prefer any of straightforward solutions proposed above, Peter Williams states that, "if the sources convey the composer's intentions," two-bar groupings diminish to one-bar motives in mm. 137–68: 2, 2, 1, 1, 1, 1, 1, 2, 2, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2.[34] (See the solid-bow phrase marks in Example 9a.) To my knowledge, no performers strictly follow this historical "phrasing". This report confirms that at least some eighteenth-century musicians perceived an at least two-bar organization only in mm. 137–38 and mm. 151–69 of Examples 8b and 9b. (This historical evidence does argue against the more popular schemes already shown in Example 8c.) In other words, these eighteenth-century sources suggest that historical performers placed the melodic accents of high pitches in relief <u>against</u> an overriding strong-weak hypermetric pattern.

The slur marks in Example 9a (the sources) suggest that any hypermeter simply evaporates and that one should discard the hypermeter proposed in Example 8a–8b for mm. 141–150 and reinforce the (β') motive in mm. 146–47. Actually, two-bar groupings easily continue until m. 143: the passing tones in the bass imply weak bars. (See the dotted-bow phrase marks in Example 9b.) But, mm. 144–50 resist a simplistic solution, other than temporarily

Example 9: Measure groupings in 18th-c copy, mm. 137–69 (Williams)
(Concentrating on problematic area, mm. 145–51)



Legend

grouping in 18th-c source

a proposed grouping

dispensing with any groupings and a dance-like lilt altogether, as recommended by the sources.

The two-bar groupings in mm. 146–47 and mm. 148–49 of the sources seem to be supported by the harmonic prolongations, with the former prolonging the dominant of F major and the latter arpeggiating a F-major chord. Taking these two groupings into consideration, one is forced to either place two strong measures next to one another and/or to justify a harmony that extends beyond its normal length (two weak bars). Both Examples 9b and 9c show two- and four-bar hypermeters, respectably, with Arabic numerals below the staves. In either of the solutions presented in Examples 9b–9c, mm. 143–45 are interpreted as prolongations of dominant harmonies that resolve in the next hyperbar, m. 146. (Later, a better prolongation of F major instead will be proposed.) The additional bar in m. 151 extends the V^7/V harmony for three bars (mm. 148–50). When performed this way, such an accentuation shift becomes immediately perceptible; and, perhaps the disturbed expectations cause the resumption of the regular pattern and ascent to the celebrate high F4 even more exciting. If one subscribes to a four-bar hypermeter using this scheme, the hyperbars are shifted from Example 8a by two measures. The straightforward two-bar solution can be heard implicitly in several recordings and more explicitly in Lippincott and in Couch.

In summary, the second pedal solo presents a number of interpretive opportunities and pitfalls. Performers who rely solely on high pitches to determine measure groupings disregard "phrase" marks provided in some eighteenth-century copies, but provide an interesting shift of accentuation against the inherent harmonic progressions of the music. Those who revere the manuscript source (e.g., Peter Williams) will temporarily scrap the concept of rhythmic organization beyond the metric level, at least for a brief passage—surprisingly, this abandonment

of hypermeter does not occur in recordings. On the other hand, those who follow a two-, four-, or eight-bar grouping without variation end up on the cadential 6/4 goal well, but may not take full advantage of the surface disturbance of the regular groupings in mm. 145–150. A new interpretation can be crafted by reflecting an attempt to explain the pedal solo as entirely hypermetric at all levels of organization through some fancier compositional processes. Such an interpretation is suggested both by historic manuscript sources and by the harmony.

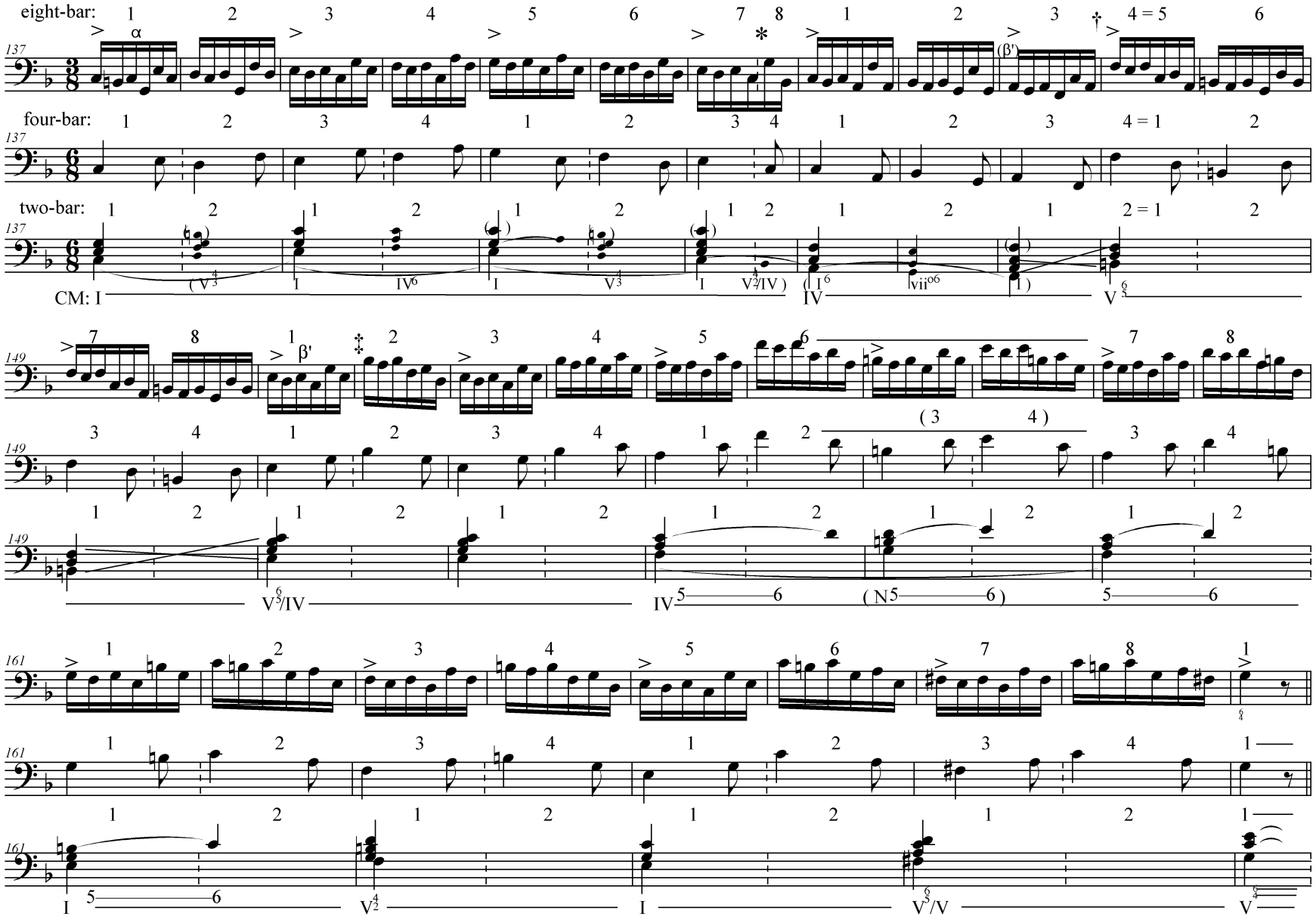
A New, Thoroughly Hypermetric Solution for the Second Pedal Solo

Theoretically minded performers may wish to more obviously project the underlying structure in the problematic area, mm. 143–51. Consistent two-stage reductions of surface motives reveals the underlying progressions and rhythm.

The second pedal solo commences with the head motive from the manual canons, a figure already strongly associated with a hypermeter. (Compare alpha (α) in m. 1 of Example 3a to that in m. 137 of Example 10a.) By m. 155, this motive transforms into a motive clearly meant to foreshadow the *tutti* head motive. (Compare beta (β) m. 193 in Example 4a, for instance, to β' in m. 151 of Example 10a.)

Each α motive during mm. 137–146 reduces to a span of a third on beats 1 and 3. (See each measure of Example 10a.) During the first four measures, mm. 137–40, the thirds ascend; and, during the next four measures, mm. 141–144, the thirds descend. This design suggests a four-bar grouping, which may participate in a yet longer eight-bar group. (See the four- and eight-bar count above and below the staff of Example 10a, respectably.) In Example 10c, the functional bassline is, this time, extracted from the lowest sounding notes of the thirds from

Example 10: A solution to the second pedal solo, mm. 137–69



Legend

* Compression of two bars into one

† elision of two hyperbars

‡ Change in surface pattern places high note in weak measures

α head motive of canonic theme

β' *tutti* head motive, altered

Example 10b. Like the line of underneath the opening canons, this stepwise bassline outlines the tonic chord. Passing harmonies in even measures create weak bars, while strong bars occur in odd measures. Hypermeter is clearly present.

The upward arpeggiations (β') also reduce to thirds, as demonstrated in mm. 151ff of Example 10b. Each arpeggiated harmony spans two measures, as can be seen in mm. 147–69. Because changes in harmony primarily produce aurally perceived barlines in Western music, it is especially clear from Example 10 that strong bars occur—without exception—on odd measures in mm. 147–68. The arpeggios, at first, start from a higher note and descend (mm. 147–50). In such cases, one can hear the strong bars unambiguously. But, in m. 151, the pattern changes such that "tonic accents" (highest occurring pitches) occur in the weak bars; i.e., the hypermeasures and melodic accents are at odds with each other. (See the double dagger (‡) in Example 10a.) As mentioned earlier, these conflicting accents are the source of much interpretive confusion, but is potentially a fact of which a talented organist could take good advantage.[35]

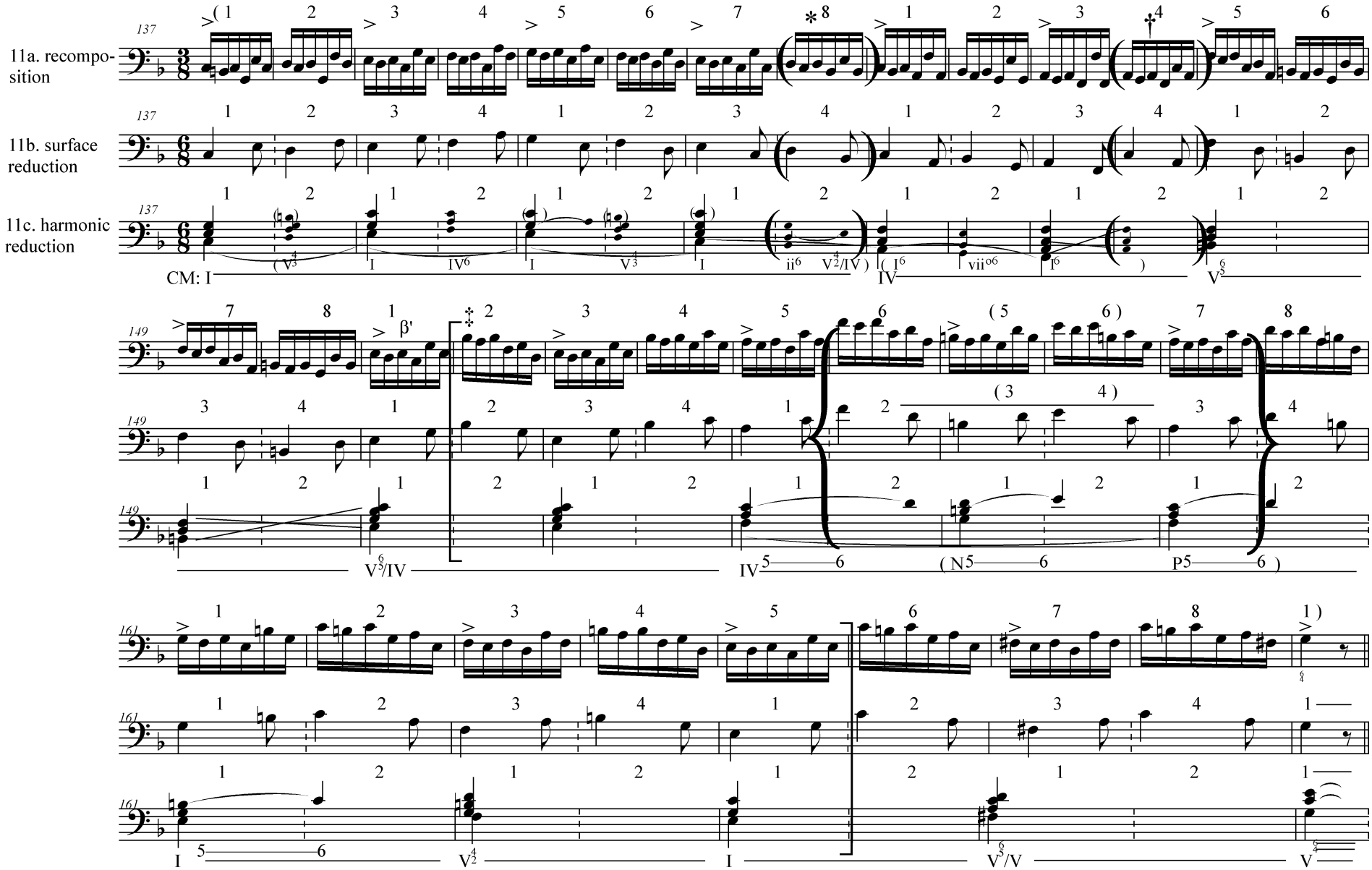
In this passage, mm. 147–69, the two-bar hypermeter is clearly evident, but the four-bar hypermeter suggested at the opening of the solo (and throughout most of the entire work) can be used to good effect as well: the dominant harmony spans four bars, mm. 147–50, and V^6_5/IV spans four bars, mm. 151–54. (See Example 10c.) Here, an eight-bar hypermeter is also possible. For the remainder of the pedal solo, harmonies progress in two-bar groups, which can also be easily organized into four- or eight-bar hypermeasures. In mm. 155–60, however, the significant arrival with the *tutti* motive on a F-major sonority spans six bars. As indicated by "N" in Example 10c, a neighbor harmony in mm. 157–58 expands the basic four-bar unit to six

written bars. (The bass contains a harmonized passing tone, G3.) The temporary hiatus from counting bars, along with the 5–6 motion, yields a sort of floating effect for this marvelous moment—any exception to the basic hypermetric pace causes a perceptible effect.

Between the evident hypermeasures explained above (mm. 137–43 and 147–69), the challenging passage mm. 132–147 offers few truly viable solutions for a thoroughly hypermetric reading. This time, the key to interpreting this area is identifying passing harmonies (weak measures). Nearly always a passing harmony, the vii^{o6} chord in m. 145 connects I^{6} to I (in F Major). Contrary to surrounding passages, strong bars thus occur on even measures! Other than total reliance upon "tonic accents" (now debunked for most of this work), this is the only other source of performers's interpretive difficulties. Achieving a strong bar on m. 144 after the strong bar in m. 143 requires interpreting two bars compressed into one. (See the analysis at the asterisk in Example 10.)

The recomposition[36] at the asterisk in Example 11 displays "omitted" materials that could fulfill all voice-leading expectations, but such a predictable sequence would have easily lead to boredom. The compression of the asterisked bar with the previous one shown at the asterisk in Example 11 avoids such monotony. (The seventh and eighth bars of Example 11 are now just m. 143 in Example 10.) To signify the compression of two bars into m. 143 for the listener, a performer might emphasize the pitch B-flat (V^4_2) at this significant tonal turn. In the face of such regular accentuation patterns and pacing, admittedly, such deliberateness on the third eighth note of m. 143 may seem mildly awkward but would be necessary for a thoroughly hypermetric interpretation. A performance score for this <u>new</u> interpretation is supplied in Example 13. To my knowledge, no recording yet does this, as it may be rather awkward and difficult to

Example 11: Recompositions of second pedal solo, mm. 137–69 and
Eighteenth-century cuts in brackets



Legend

( ) inserted measures [ ] first set of historically omitted measures { } second set of historically omitted measures

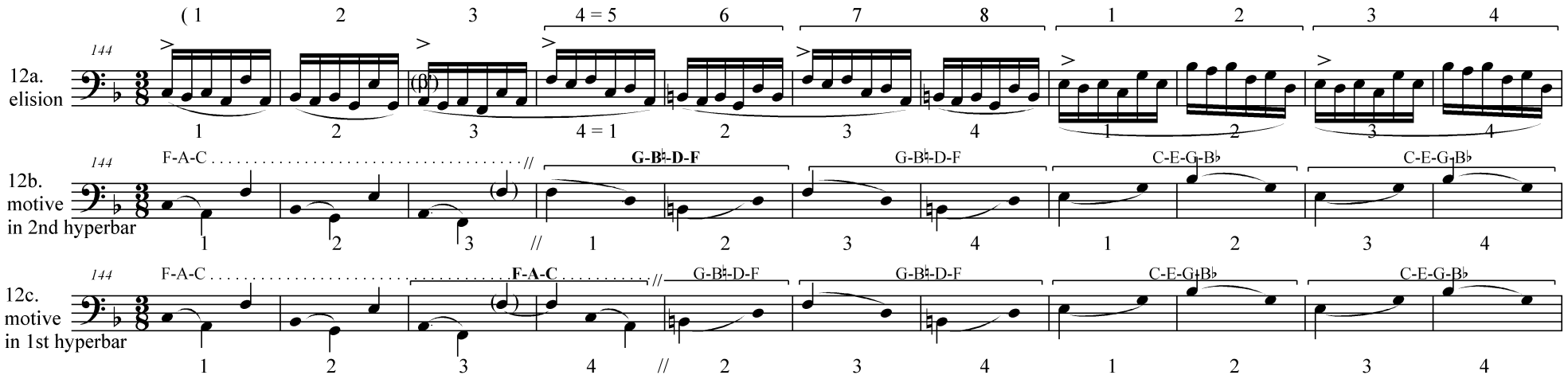
communicate the compression in quick performances.

In mm. 146–47 of Example 10, two strong bars also occur in a row. In the forward direction, the downward arpeggio in m. 147 initially seems to outline a F-major chord with a (β') motive. (See F-A-C boldfaced above mm. 146–47 in Example 12c.). As shown in Example 9a, a two-bar grouping (mm. 146–47) in some eighteenth-century copies confirm such an arpeggiation of a F-major sonority. In retrospect, one notices, however, that the grouping mm. 147–48 recurs in mm. 149–50, in which arpeggiation outlines a dominant harmony (G). (See G-B♮-D-F boldfaced above mm. 147–48 and above mm. 149–50 in Example 12b.) So, in retrospect, m. 147 appears to also initiate a two- (or four-) bar group on the dominant of C major.

To most listeners, the harmonic meaning of the figuration in m. 147 can be usefully ambiguous, working almost like a common-chord "modulation" between hyperbars: does the harmony prolong the previous or the succeeding harmony? Considering these two possibilities (outlining F-major or the dominant), the best solution seems to be a reinterpretation of m. 147, in which the measure functions simultaneously as the fourth bar of the previous group and as the first bar of the succeeding group.[37] (See the elision marked "4=1" and "2=1" in m. 147 of Examples 10a–10b.) The figuration works in both harmonies.

At the dagger (†), Examples 11a–11c demonstrate how the composer could have filled in the "missing" fourth bar with a F major sonority, either in root position (11a) or first inversion (11b–11c). Numerous surface patterns would be satisfactory here, but three bars of a F-major triad (or a prolongation thereof) seems excessively redundant. Perhaps also to avoid such rhythmic monotony, Bach or a copyist elided the fourth and first bars of the four-bar hypermeasure, letting the one bar stand for two. (Compare mm. 147–49 of the recomposition in

Example 12: Ambiguous harmonic function in m. 147



Legend

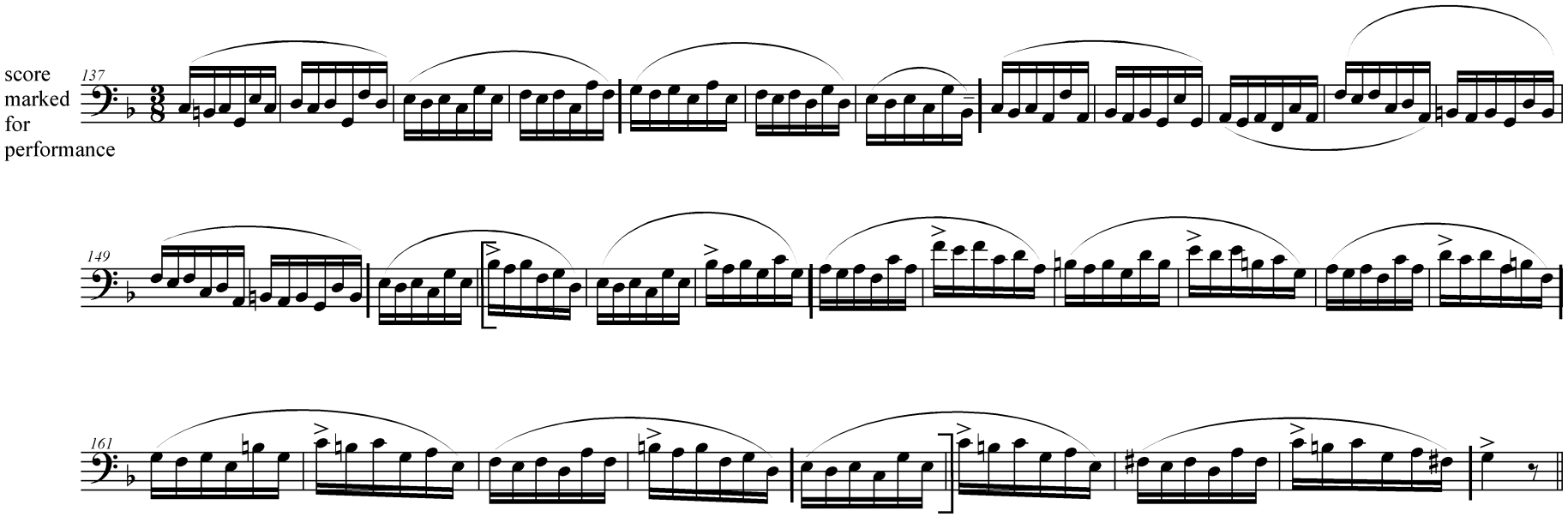
⌐¬	repeated measures
⌒	phrasing in 18th-c copy
(β')	*tutti* theme, altered
//	broken hypermeasure
. . . . .	chord being prolonged

Example 11 to m. 147 in the music of Example 10.) Through elision, the score that editors have inherited seems to literally present two strong bars in a row but nevertheless preserves an aurally perceptible hypermeter.

Although the compression employed in m. 143 might have parallels in other sections,[38] this elision found in m. 147 has no obvious parallel in BWV 540. Either Bach deftly avoided the monotony of an invariant hypermeter or some eighteenth-century sources themselves may be corrupt. Nevertheless, the slurring found in at least one source suggests the copyist had difficulty deciding how measures group and had no consistent criterion. Peter Williams's careful description of the copy suggests that, although Williams finds the flexibility of the motive impressive, he also finds the phrasing curious. Williams reports but does not remark on the value of the eighteenth-century interpretation.

The second pedal solo, in sum, presents numerous interpretative challenges that deserve much contemplation and probably some deliberate playing. Typical of lilting gigue-like works, the solo presents a clear two-, four-, and perhaps eight-bar hypermeter,[39] but one passage, mm. 143–147, requires extraordinary reworking in order to yield a truly regular alternation of strong and weak bars. The perceived alternation may not be literally on the score but implicit (and brought out by the performer). It might be most expedient, however, to temporarily abandon the 6/8 meter as some eighteenth-century musician(s) recommended—as many fast players do today. Whatever one decides, both Example 10 and the sources in Example 9a present strong evidence against placing hypermetric-like accentuations on the high pitches in mm. 151ff. Rather, they suggest that one might hear high pitches here as important counterstresses contrary to the prevailing hypermeasures. Such an interpretation then also significantly foreshadows the

Example 13: A new performance interpretation for the second pedal solo, mm. 137–69



Legend

>	Cross accents used in performance (*not* previous symbol indicating strong measures)
⌒	Two-bar (6/8) lilt used in performance
–	Lengthening to represent compressed bar
[ ]	Best historical cut, if F4 doesn't exist on pedal board
|	Hyperbars (thick barlines approximately every 4 bars)

ambiguity of the first *tutti* theme (an apparent hypermeter shifted by one measure).[40]

Adapting the Second Pedal Solo to Small Pedal Compasses

Historical organs often lack the high pedal F4 required by the second pedal solo of BWV 540/1. Several solutions from the nineteenth to modern day have been proposed: (1) substituting a few manual pitches for the missing pedal notes, (2) doubling the pedal solo with the manuals, and (3) excising measures outside the pedal compass. When discussing how a performer might deal with notes outside the pedal compass, Hermann Keller not only discourages doubling the pedal with the hands; he simultaneously reveals his intuitive sense of four-bar hypermeter:

> If anyone today still has no f^1 in his pedal, he will do well to omit the **four** measures of the pedal solo in question (not play them in octaves on the manual as Griepenkerl proposed) and play a few later passages an octave lower.[41]

Although the study of hypermeter and tonal analysis here cannot shed light on whether manual doubling is proper performance practice (options #1 and #2), it can be used to rate the other options: Which four bars might be deleted to best effect?

Williams only briefly mentions two historical solutions: omitting mm. 152–65 or deleting 156–59.[42] (See the square and curly braces, respectably, in Example 11.) The first option preserves the surface motives (Example 11a); but, more important, the underlying voice-leading, harmonic progressions, and both four- and two-bar hypermeters proceed without fault. (The eight-bar units unfortunately do not survive either cut.) Furthermore, this version of the second pedal solo contains a convincing melodic highpoint, C4 in m. 164. Omission of mm. 152–65 provides a structurally sound solution for limited pedal compasses. Its only drawback is its brevity as compared to the first pedal solo.

Williams's second option, excising mm. 156–59, is less satisfactory. This cut does not disturb the voice-leading nor any harmonic progressions. Also, the strong-weak alternation easily continues in a two-bar pattern; but, the possibility for the four-bar hypermeter diminishes, and, to me, is noticeable absent when the first bar in m. 155 skips to the fourth bar in m. 160. (See Example 11, removing the material between the curly braces.) This may be heard in Fagius at 3:05. Although the reduction of six bars to two bars of the F-major arpeggio and harmony on this significant arrival may seem somewhat anticlimactic, the worst aspect of this solution is the lack of a convincing melodic high point: the literal climax of the pedal solo, D4 in m. 160, now functions as a neighbor tone. The functional highpoint, C4, now recurs too often, robbing the solo of any melodic climax, and, without forward drive, one senses the missing material.[43] Furthermore, the surface figuration seems unconvincing.

Without an autograph, one cannot ascertain whether an abridged version (without mm. 152–65) or the familiar, longer version truly comes from the composer. Both versions produce satisfactory performances, both grammatically and dramatically (even if not rhythmically). The abridged versions emphasize the most important pitch, harmony, and key area of the section, C. Perhaps one of Bach's successors desired more flair and inserted the tonal sidetrack to F major in mm. 151–65, but the acknowledgment of F major—the key of the work—in the C-major prolongation seems especially significant as the *tutti*-like motive emerges. This gesture towards F major within the C-major pedal solo perhaps answers the F-major pedal solo, mm. 65–82, which earlier rose to its high point of C4 in m. 59. By soaring to F4 in the second pedal solo, the full version also takes advantage of the full pedal range and strengthens the virtuosic effect.

In summary, the range of the second pedal solo in BWV 540/1 demands that performers

tailor the second pedal solo for smaller pedal boards. If, for numerous reasons, one chooses not to substitute missing pedal notes with manual playing, omission of mm. 152–65 provides the most attractive solution (square braces in Example 11). Although theoretically possible and more commonly used, the less the radical cut (curly braces in mm. 152–65) is less apt, in my opinion. The unabridged version, however, exceeds all solutions in terms of length and sheer drama. This probably explains why all but one recording feature organs with the full pedal compass.

Remarks on the Overall Interpretation of BWV 540/1 with Hypermeter in Mind

Despite the title "Preludio" for BWV 540/1 in some sources,[44] its introduction presents, for the most part, an unambiguous two-, four-, and perhaps eight-bar hypermeter. (A few "hitches" occur in the manual canons and the second pedal solo.) This somewhat predictable phrase rhythm provides an expansive effect that encourages a fast pace and a desire for virtuosity instead of relying upon true harmonic, contrapuntal, or rhythmic interest.[45]

In contrast, the two competing accentuation schemes in the recurring *tutti* theme (c) provide thrilling rhythmic tension that much exceeds that of the rhythmically regular introductory sections. As the subsequent arrival on unambiguously strong measures solves the listener's dilemma, Bach switches to other means to thrill listeners: a suspenseful dominant pedal point (b) and then succession of dissonant harmonies (c'). Only at the end of the *tutti* sections does the tension temporarily subside (a'), before counterpoint clearly becomes the primary focus of succeeding *concertino* sections.[46] (See the *tutti* themes c, b, c', and a' in Diagram 1.) The building of tension and subsequent release is characteristic of the R_1.

The second ritornello (R_2) serves to increase tension towards the middle, without release. This tension thus seems to continue into the *concertino*, contributing to the greater effect of S_2. With the reentry of the *tutti* (R_3), the tension seems to further escalate, as evidenced by the rising tessitura in the manuals. The release (a') does not seem to compensate for this relative climax, probably leading performers to regularly express the energy through a trill on m. 342 of S_3.

The lack of immediate resolution of tension (with a') in R_4 makes the ending even more glorious: a' occurs only at the very end after two massive pedal points and many dissonant harmonies. The brevity of the a' and especially the final cadence in comparison to the previous passagework continues to shock listeners, perhaps leading to the desire to pair BWV 540/1 with a substantial double fugue BWV 540/2.

Within the final ritornello, many of the rhythmic "dissonances" are "resolved" through expansion. In mm. 375–382, the previously seven-bar theme (b) finally displays its correct eight-bar length (Example 7), as beautifully performed by Christopher Herrick at 7:04. This noticeably removes the elision that created two successive (tense) strong bars and confirms the hypermetric reading the listener may have desired. Afterwards, Bach's four-bar ritornello statements (c) become six expansive bars in mm. 382–87 and 388–393, in preparation for the prolonged dominant pedal point.[47] This sort of expansiveness, once again, encourages the sense of fast-paced virtuosity associated with the opening of the work.

As one of several compositional techniques available, ambiguity in rhythmic patterning plays a role in Bach's scheme of managing tension throughout the work as indicated by the shading in Diagram 1. Although the sheer length of the introduction might have resulted in a dangerously "front heavy" toccata, the careful use of tension drives the work forward towards an

even larger "end effect" that seemingly necessitates even more music! Although not in a traditionally "unmeasured prelude style," this massive toccata seems to still function as a prelude.

Conclusions

The introduction and several subsequent passages of the Toccata in F, BWV 540/1, clearly establish a two- and four-bar hypermeter. At times, an eight-bar scheme is appropriate. The initial *tutti* theme and the second pedal solo, however, contain aurally ambiguous accentuation patterns; that is, more than one hypermetric scheme seems to convey conflicting sensations of a compound meter. But, under detailed examination, the cross accents of one stream of accents obscures the underlying hypermeter (one is a "shadow meter"). The performer's recognition of this purposeful tension and understanding the undergirding pattern leads to truly viable interpretations. While a few performers choose to present this tension without any interpretation, most performers settle upon one of the following strategies:

(1) foregrounding the conflict,

(2) tricking the listener by following the surface patterning until the end,

(3) reflecting the underlying structure throughout, or

(4) vacillating between interpretations, depending on other factors.

In its structure, the first *tutti* theme and other passages, for the most part, strictly conform to the strong-weak pattern of Baroque dance, in which each four-bar unit begins with a strong measure and ends with a weak-measure cadence. This hypermetric organization results in the robust start and a strong desire for continuation that one senses from hypermeasure to

hypermeasure in the *tutti* sections. As one of a series of compositional techniques, the inherent "ambiguity" of the first *tutti* theme and its cross accents contribute to the overall regulation of tension throughout the work and the balancing of the form against the massive introduction.

In the pedal solos, a steadfast adherence to a two-, four-, and/or eight-bar hypermeter serves the performer well, but the second pedal contains two "skips" in the expected accentuation, if one wishes to communicate the underlying progressions and simultaneously maintain the a compound-meter effect. Otherwise, one works dynamically against the underlying structure, or one temporarily abandons the projection of measure groupings, as suggested by an eighteenth-century copy.

The analysis of the second pedal solo in this article also provides one more piece of evidence when deciding between the historical solutions presented by Peter Williams on adapting the passage to a shorter pedal compasses common amongst historical organs and their replicas. Only one of the two historical cuts preserves a recognizable four-bar hypermeter, the surface figuration, and a good sense of melodic climax.

The most convincing performance interpretations, in summary, acknowledge strong arrival points and work with or work systematically against underlying progressions. These two structural elements, along with changes in texture and motive, ultimately help listeners and Baroque performers discern the measure grouping for the driving *tutti* theme and the rousing pedal solos. The same criteria underlie the choice of cuts required to adapt the second pedal solo to short pedal compasses. Ultimately, the explanation of hypermeasures in this paper not only justifies listeners' perceptions of a compound meter but also suggests approaches to the performance of this remarkable masterwork.

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ENDNOTES

1. Johann Philipp Kirnberger, *The Art of Musical Composition* (1771–79), trans. David Beach and Jurgen Thym (New Haven: Yale, University Press, 1982), 399. This chapter can also be found in W. Oliver Strunk and Leo Treitler, eds., *Source Readings in Music History* (New York: W. W. Norton & Co., 1998). The beaming of six sixteenths in BWV 540/1 suggests one beat per notated measure (a 6/8 effect), and perhaps a 6/8 notation of the *concertini* of BWV 540/1 (in my ear-training students' opinion) would have become unwieldy. Bach is known to have reformulated 6/8 works in 3/8 (Channon Willner, "Durational Pacing in Handel's Instrumental Works: The Nature of Temporality in the Music of the High Baroque," Ph.D. diss (City University of New York, 2005), 235). Furthermore, the practice of beating "up" and "down" measures in larger structures is not at all unfamiliar to the Baroque listener, dancer, and musician: In the minuet, "*their* [18th-c dancing masters'] measures were twice as long as those in the music" (Meredith Little and Natalie Jenne, *Dance and the Music of J. S. Bach*, expanded ed. (Bloomington, IN: Indiana University Press, 2001), 67–68).

2. William Rothstein, *Phrase Rhythm in Tonal Music* (New York, N.Y.: Schirmer Books, 1989), 8. The term was first coined in Edward T. Cone, *Musical Form and Musical Performance* (New York, NY: Norton, 1968). For a history and some reservations about its scope, see David H. Smyth, "Patterning beyond Hypermeter," *College Music Symposium* 32 (1992): 79–84. In literature not intended solely for music theorists, the term and associated analytical technique have been more often applied to the J. S. Bach's "dance" music, such as Partita No. 2 from BWV 826 (David Schulenberg, *The Keyboard Music of J. S. Bach* (New York: Shirmer Books, 1992), 282–83). Throughout the discussion of keyboard suites, Schulenberg aptly describes manipulation of phrase lengths and piquant measure-to-measure accentuation. Like BWV 540/1, the cited rondeau, BWV 826, displays a 3/8 meter designation.

3. Kirnberger, 398. Willner explicates that "because the measure in the triple meters is often shorter than the comparable measure in the duple meters, it lends itself more readily to participation in larger and inherently duple durational heirarchies" (Willner, "Durational Pacing," 222).

4. Kirnberger, 398. For a brief summary of the implicit tempi of 3/8, see George Houle, *Meter in Music, 1600–1800: Performance, Perception, and Notation* (Bloomington, IN: Indiana University Press, 1987), 43–49. Also, Meredith Little and Natalie Jenne classify BWV 540/1 as a "Giga II-like" work (Little and Jenne, 305), thus warranting a good, lilting tempo (ibid., 20 and 275). Kirnberger states that "3/8 meter has the lively tempo of a passepied [one of the fastest dances]" (Kirnberger, 397), and that it "has a liveliness that is somewhat frolicsome" (ibid., 400). Like many of his contemporaries, Kirnberger clearly implies smaller beat values and also smaller note values naturally imply faster tempi (ibid.). On the other hand, Keller remarks that "I once heard it played . . . [like] Czerny instead of Bach!" (Keller, 121).

5. See objections to hypermeter in Joel Lester, *The Rhythms of Tonal Music*, Chapter 6.

6. Peter Williams, *The Organ Music of J. S. Bach*. 2nd ed. (New York, N.Y.: Cambridge Univ. Press, 2003): 78. Williams reports a loose eighteenth-century scheme of one- and two-bar "phrases" in mm. 137–68; and, these two groupings of motives *might* be applied throughout the entire work. Later in the paper, I will discuss this problematic grouping at length. (Incidentally, Williams's groupings, in a modern musical-theoretical sense, do *not* constitute "phrases", for each unit lacks an internal harmonic goal or cadence. See Rothstein, 5.)

7. Little and Jenne, 305. The French gigue features imitative textures and, while using four-bar phrasing, deviates from regular expression of the hypermeter more often (ibid., 250). The expected French *sautillant* figure, however, is not characteristic of BWV 540/1. This *hemiola*, however, can be easily found in another fast dance, the passepied, as well as in several slower dances. (See the third stereotypical pattern in Little and Jenne, 87, which resembles BWV 540/1 very much. The other two passepied dance rhythms do not. These authors remark that the melodic *hemiola* in BWV 1066 is not reinforced by harmony (ibid., 90). Perhaps the usage in m. 3 in BWV 540/1 is similar.)

Common to the passepied, the "quick" 3/8 signature in part produces its "light, fickle, playful" nature. One can find offbeat rhythms for a "playful" effect. With the melodic *hemiola* in its theme, perhaps the opening canons of BWV 540/1 resemble the passepied, esp. when one considers that pedal points (drones) frequently accompany the passepied (but for a more pastoral effect). The passepied relies on an upbeat, like my interpretation of the *tutti* theme, and the dance type displays balanced four-bar phrasing. Perhaps the more complex hypermetric techniques of the pedal solo (to be discussed) highlight the "fickleness" of the passepied rather than the gigue. Mattheson's characterization of the passepied however tempers one's thoughts that association (Johann Mattheson, *Der vollkommene Capellmeister: A Revised Translation with Critical Commentary*, trans. Ernest C. Harriss (Ann Arbor, MI: UMI Research Press, 1981), 460). Mattheson incidentally also remarks that some gigues are intended not for dancing, but for fiddling (ibid., 457). This character seems foreign to the toccata's grandiose size, gestures, and overall effect.

8. The standard upbeat lines up with the interpretation in m. 193 of Example 5b (*tutti* theme) to be discussed later. The lack of such a convincing upbeat measure in the *concertini*, incidentally, make the their beginnings that much more arresting.

9. Little and Jenne cite two stereotypical "Gigue II" patterns, which both pervade this movement. The quarter-eighth rhythm of the *tutti* theme permeate the second stereotypical rhythmic pattern; while the four-sixteenth/eighth-note pattern that pervades the last two pages of the piece can be found in both patterns. The *hemiola* of the introductory theme (e.g., mm. 2–3 in Example 3a) is the only significant pattern atypical of this dance type. Without the tie in m. 3, this rhythm would be thoroughly gigue-like.

10. Little and Jenne, 275.

11. Ibid., 165

12. Henry J. Eickhoff, "Bach's Toccata-Ritornello Forms," *The Music Review* 27: 1 (Feb. 1966): 5. Also see Mauro Botelho, "Rhythm, Meter, and Phrase: Temporal Structures in Johann Sebastian Bach's Concertos," Ph.D. diss. U. Michigan, 1993.

13. Eickhoff, 5.

14. Channon Willner, "Stress and Counterstress: Accentual Conflict and Reconciliation in J. S. Bach's Instrumental Works," *Music Theory Spectrum* 20/2 (Autumn 1998): 282.

15. Channon Willner, "Durational Pacing in Handel's Instrumental Works: The Nature of Temporality in the Music of the High Baroque," Ph.D. diss. (City University of New York, 2005). For an introduction to the techniques of durational reduction, normalization, and the notation thereof used in this paper, see Willner, "Durational Pacing," 37–44, or Rothstein, *Phrase Rhythm*.

16. Fred Lerdahl and Ray Jackendoff, "On the Theory of Grouping and Meter," *The Musical Quarterly* 67/4 (1981): 479–506; and idem, *A Generative Theory of Tonal Music* (Cambridge, Mass.: MIT Press, 1983).

17. Mauro Botelho, "Rhythm, Meter, and Phrase: Temporal Structures in Johann Sebastian Bach's Concertos," Ph.D. diss. U. Michigan, 1993. Also see Justin London, "Metric Ambiguity (?) In Bach's Brandenburg Concerto No. 3," *In Theory Only* 11/7–8 (1991): 50–52.

18. As bracketed in Example 3a, the musical surface contains *hemiola* in the third and fourth measures of the canonic theme. Although the surface rhythmic disturbance helps listeners identify theme entrances and relieves the monotony of too much rhythmic regularity, the *hemiola* does not affect the underlying harmonic pacing, voice-leading, nor the hypermeter.

19. During his performance at the 2007 AGO Region IV Convention, William Porter clearly marks thematic entrances and thereby creates the perception of two-bar grouping (William Porter, June 18, 2007 (9:30AM), at St. Bede's Episcopal Church, Atlanta, GA). Porter also clearly juxtaposes the surface *hemiola* against the two-bar hypermeter he projects.

20. At points, the four-bar hypermeter seems to evaporate, but a strongly established four- or even eight-bar hypermeter can potentially create the expectation of continuation and thus its perception through such more weakly defined passages. The alternation of strong and weak measures certainly continue. Note that strong beats in a 4/4 measure have been used interchangeably during the Baroque period. One can easily find an example in Bach's transcription of Vivaldi's Concerto in A Minor, BWV 593/1 (RV 522/1), in which the *ritornello* enters on the first and/or the third beat, as if the first and third beats in a Baroque 4/4 meter are often essentially equivalent. On Mattheson's, Marpurg's, and Kirnberger's theoretical discussions of this situation in Botehlo, 22.

21. See "Tonic Accent" (p. 864) or "Accent" (p. 3) in Don Michael Randall, *The New Harvard Dictionary of Music* (Cambridge, MA: Harvard University Press, 1986).

22. This is a fact of BWV 540/1 I've tested in my ear-training courses for years. Because durations, textures, and harmonies imply meter, performers do not usually need to "dynamically" emphasize strong beats (Joel Lester, *The Rhythms of Tonal Music* (Carbondale: Southern Illinois University Press, 1986), Chapters 2–3; and, Houle, Chapter 4). Likewise, the perception of hypermeter often relies upon such musical cues, and, consequently, obvious cases require no conscious effort from the performer. In ambiguous cases, the performer here must decide whether ambiguity is (1) aesthetically valuable, (2) cross accents oppose the prevailing hypermeter, or (3) hypermeter vanishes altogether into a freer "prelude" style. To me, the lilting effect of BWV 540/1 and students' perceptions thereof make the third option untenable. For a remarkable discussion of the performer's role, see Justin London, "Metric Ambiguity (?) In Bach's Brandenburg Concerto No. 3," *In Theory Only* 11/7–8 (1991): 22 and 24–26. In sum, "Competent performers are sensitive to the listener's temporal limitations, and hence take care to make clear rhythmic and metric structure as it unfolds" (London, 40).

23. The much quoted performer/scholar Hermann Keller emphasizes four-bar hypermeasures: "The second theme may be played by alternating manuals every four measures; but playing the detached chords also with a change of manual every two measures . . . destroys the uniform curve of the eight measures" (Hermann Keller, *The Organ Works of Bach: A Contribution to their History, Form, Interpretation and Performance* (New York, N.Y.: C. F. Peters Corp., 1967): 120). While acknowledging 2-, 4-, and 8-bar units, Keller discourages the two-bar interpretation here and in the manual canons. He instead prefers more "expansive curves" (ibid., 119): "A warning may be given not to cut up the long lines of the beginning by articulation that is too trivial" (ibid., 121).

24. Keller simply states that "spaced" eighth notes (m. 197 and parallel passages) initiate eight-measure phrases, thereby implying the beginning of a new hyperbar (Keller, 119).

25. This can be heard especially in performances with slower tempi. Hans Fagius, for instance, achieves these accentuations by slightly stretching during the last bars and cadencing in each *tutti* statement of R_3 (Hans Fagius, *The Complete Organ Music of J. S. Bach* vol. 7 (Djursholm, Sweden: BIS, 1990). His stately tempo makes the *rubato* of cadences regularly at four-bar intervals seem reasonable. But, at faster tempi, such regular stopping often seems mannered. But, with a faster clip, Marie Claire-Alain elegantly accents the detached chords, which elegantly hover between the sense of marked articulation and a cadential effect (Marie-Claire Alain, *J. S. Bach Complete Works for Organ* Vol. 12 (France: Erato, p1994))—it's ambiguous.

26. Starting a strong measure with a suppressed downbeat is nowadays called an "afterbeat". See Rothstein, 29–30 and 50–51, and Willner, "Stress and Counterstress," 289.

27. The recent term “shadow meter” describes this series of cross accents. See Willner, “Durational Pacing,” 223, 435, and 635. The term was coined in Frank Samarotto, “Strange Dimensions: Regularity and Irregularity in Deep Levels of Rhythmic Reduction,” in Carl Schachter and Hedi Siegel, ed., *Schenker Studies* 2 (New York: Cambridge, 1999): 222–238.

28. Heinrich Schenker states “Unless there are rhythmic demands to the contrary . . ., every metric scheme is capable of enclosing the cadence within itself in such a way that the I appears in the final unaccented measure of the measure group” (quoted from *Free Counterpoint*, 288, in Frank Samarotto, *A Theory of Temporal Plasticity in Tonal Music* . . . (Ph.D. diss., City University of New York, 1999), 74.)

29. See mm. 364–65 in Example 6a for an example of a cadential chord transforming into a dominant of the succeeding harmony. The ancillary support for weak-beat cadences seems less apt when cadences resolve to minor chords, such as in m. 182. Nevertheless, the weak-beat cadence seems to be characteristic of this work, not only in *tutti* melodies but throughout. See, for instance, the final cadences of *concertini* in mm. 238, 290, and 351. The competing interpretation of strong and weak measures would place strong-beat cadences in the *tutti* melody, which is atypical of the work as a whole.

30. In 1831, Mendelssohn wrote enthusiastically to his sister about this passage (Williams, 76). And, Williams himself remarks that “very striking to the listener is the rhythm of the cadence figure, so much that it becomes a kind of mini-rondo” (ibid.). While devoting nearly a page to the musical passage, Williams does not attribute the striking character to more than the admittedly extraordinary harmonic progression. The timing of harmony is essential. The dramatic interrupted cadence and $\frac{4}{2}$–6 harmonic sequences, mm. 204–207, 318–21, and 242–7, incidentally start with a transposed B - A - C - H motive.

31. In some passages, such as mm. 368–70, mm. 375–80, and mm. 417–22, the articulation provides only an expansive contrasting texture (ornamental). Although the same articulation at many phrase endings often suggest a cadence, this does not necessarily mean that each eighth note functions as a measure in a hypermetric scheme. Frankly, the very meaning of the detached eighths seems ambiguous (functional or ornamental). At the end of the work, mm. 437–38, for instance, the detached eighths certainly become cadential. Although the hypermeter from the passage leading up to the final cadence easily conforms to a strict strong-weak pattern for each two- (or four-) bar group, the heavy accents and sudden *ritardando* required for an effective ending, however, seems to the cadence sounds more like a six-bar group (4+2) at the end. The meaning of this element can also be seen as conveniently ambiguous.

32. In his 2007 live performance (previously cited in note 19), Porter used an usually clever strategy in which the accents at the beginning of the second pedal solo were less well defined (“ambiguous”) and gradually built to high-note accents for the pedal climax on F4. Subsequently, the accentuation transformed into accents on both low and high notes (one-bar) to make an effective arrival on the cadential $\frac{6}{4}$. In his first pedal solo, incidentally, Porter marked the two-bar hypermeasures with accented the high notes; so, the assumed hypermeter had been established for the listener in an obviously parallel passage.

33. Several voice-leadings are possible, and the selection of an implicit bassline is especially problematic—a better solution proposed in Example 9 is discussed later in the paper. One should also note that, in m. 151, the introductory theme transforms into the *tutti* melodic design, such that the lower note initiates an ascending arpeggio.

34. Williams, 78. No autograph exists.

35. For an excellent performance, hear Joan Lippincott, 1997. She maintains the hypermeter while achieving the cross accents of the highest pitches. She incidentally uses an unswerving two-bar lilt without worrying about the solutions for mm. 143–147 recommended in this article. At her fast clip, this fact doesn’t seem to matter.

36. For explanation and justification for this common Schenkerian technique that theorists use to uncover underlying large-scale pacing (hypermeter), see Wilner's "On Durational Pacing" or Rothstein's *Phrase Rhythm*.

37. Here, the ingenious malleability of α and β' allows multiple harmonies: "The sheer number of variants to this patterns gives rise to is unique, leaving the impression that every group of six semiquavers is related. The movement is ingenious in its use of the two basic motives. . ." (Williams, 78).

38. See earlier discussion of slower, deliberate performances of the *tutti* theme for such a model. Perhaps this unique shift in BWV 540/1 harkens back to the original meaning of the Baroque, "misshapen." Incidentally, for a historical precedent for using elision to suppress a bar of music, see Heinrich Christoph Koch, *Introductory Essay on Composition* (1787), trans. Nancy Kovaleff Baker (New Haven: Yale Univ. Press, 1983): 54–59.

39. Because the toccata suggests dance and, more specifically, the gigue-II or passepeid, it makes these manipulations of hypermetric accent seem even that much more pleasantly surprising. In the French gigue (Little and Jenne, 148) somewhat and especially some other dance types (ibid., 121), such changes of accent and phrase lengths are more common.

40. Throughout this work, Bach normally prevents overly accented downbeats by placing high pitches (cross accents) on weak beats. In m. 1, for instance, the large leap and highest pitch occur on the third beat of the measure; and the impressive leap and accent due to the *hemiola* in m. 3 also occurs on the third beat. (See Example 3.) Likewise, when the pedal solo becomes more expansive in mm. 151–69, Bach employs high pitches as cross accents against the hypermeasures. This is particularly confusing to the listener, because, in the first pedal solo, the higher pitches occurred on strong measures. In the second pedal solo, Bach increases this tension by recalling this situation of aligned higher pitches in mm. 177–78. Thus, the opening theme presages both the pedal solo, which in terms prepares the listener for larger-scale cross accents in the *tutti*.

41. Keller, 119. Several sources provide alternatives for shorter compasses between mm. 155–64 (Dietrich Kilian, *J. S. Bach: Neue Ausgabe* Series IV, vol. 4–5 kritische Bericht (Kassel: Bärenreiter, 1978–79): 408). For a discussion of particular sources, see Kilian, 404–408.

42. Williams, 78.

43. No convincing cut within the prolongation of F major can be made, because no high point above C4 can be achieved within a F major arpeggio without exceeding the limited pedal range: The next highest pitch after C4 in the arpeggio is F4. This necessitates a more radical cut, such as the first solution, that transforms C4 into a convincing (virtually singular) melodic arrival.

44. Williams, 74.

45. When discussing Cone's theories, Botelho mentions how metrical ambiguity relieves metrical squareness (Botelho, 79; Cone, 66). The introduction of BWV 540 seems somewhat square, and, thus, the performer should cherish the surface hemiola. The *tutti* section and the second pedal solo keeps this predictability from becoming too monotonous.

46. The *concertini* maintains high energy through the competition of themes (triple-invertible counterpoint) and sheer contrapuntal density.

47. Incidentally, Handel solves hypermetric issues similarly through expansions in his concerti. See Willner, "Durational Pacing," Chapter 5, and the definition of "expansion archetype" in Willner, 452.