Temporal Gestalt Analysis and Principles of Form and Contrast
in Bach's *Well-Tempered Clavier*, Book 1

by

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Since its composition in the mid-eighteenth century, Bach's *Well-Tempered Clavier* has become

a foundation to both keyboard literature as well as the Western musical tradition generally. As

evidence of its canonical status, previous studies on the work have covered an exhaustive range of

perspectives. Some writers, such as Siglind Bruhn and Marjorie Engels, have tackled the work from

an ahistorical, positivist perspective. Others contextualize the work historically, the most recent

and authoritative example being David Ledbetter's *Bach's* Well-Tempered Clavier: *The 48 Preludes

and Fugues*. Ralph Kirkpatrick notably covers a gamut of approaches—historical, esthetic, positiv-

ist, and interpretive—in his book *Interpreting Bach's* Well-Tempered Clavier. In books and articles,

still others have tackled the work's reception history and its compositional process.

Such depth and breadth of knowledge raises the question, what can we yet gain by further

study? The answer depends on why one studies music. In his book *A Guide to Musical Analysis*,

Nicholas Cook asserts that the most fundamental reason we study music is "to illuminate the

music" and not to "prove the validity of [a theorist's] analytical method" (2). In seeking to illumi-

nate the music, the resultant understanding isn't necessarily objective: "personal involvement . . .

is, after all, the only sensible reason for anyone being interested in music" (3). Rather, analysis

fulfills its existence by helping musicians "set aside details and 'see' the large-scale connections

appropriate to the particular musical context." For performers, this practice aids in memorization

and the judgment of long-scale relationships (232). If we study music for these reasons, then the

existing literature is sufficient, even if some scholars have qualms with segments of it.[1]

Cook, however, presents another possible role for analysis, arguing that inasmuch as

analysis engenders the "weigh[ing of] alternatives, to judge how it would have been if the com-

poser had done this instead of that," analysis is the process by which "today's composers serve

apprenticeship with the masters of the past" (232). Taking this idea further, Cook contends that

"if we accept that the value of an analysis consists in what it does for the analyst, then it is plain that what would be a bad analysis under one set of circumstances can be precisely what is wanted under another" (233). He then cites the analyses done by post-war Darmstadt composers as an example of this situation, calling them "speculative to the point of irresponsibility" and "frequently downright unmusical." However, these analyses were useful because "they stimulated an outburst of creative innovation in musical style" (233).

It is in this vein—of using analysis to create transferable solutions to new music rather than using it simply to illuminate the piece in question—I wish to address *The Well-Tempered Clavier*. Now, it is clear that listener expectations derive primarily from a work's internal patterns.[2] Since musical ideas (primarily) gain their meaning only in relation to one another, each alteration, addition, and subtraction affects the entire network. In the absence of cookie-cutter forms, how can a composer effectively approach the formal elements of music?

The Well-Tempered Clavier is a composition well-suited for exploring this question. While Bach draws on many contemporary stylistic conventions, each of the pieces is formally unique. To parse these differences, I have chosen to use James Tenney's theory of temporal gestalts (first presented in his monograph *Meta-Hodos* and later expanded elsewhere), because it not only is stylistically neutral[3] but also addresses directly the pattern-making that underlies physiological and psychological responses.[4] Although from the perspective of textbook forms, Bach's *Well-Tempered Clavier* is enigmatic, it demonstrates well the formal principles James Tenney proposes, namely that form can be understood in terms of the shapes and structures of a work's constituent components. Through studying the Preludes and Fugues of Book 1 of Bach's *Well-Tempered Clavier*, I found that, on the formal level of entire movements, Bach creates shape consistently through the use of directional asymmetries but structure through a variety of methods. In this paper, after explaining

my methodology, I primarily intend to explore Bach's formal strategies as they exist in *The Well-Tempered Clavier*, though in the conclusion, I will suggestion some compositional applications.

Understanding Temporal Gestalts

At the heart of Tenney's theory is the postulate that time is hierarchical: "A piece of music does not consist merely of an inarticulate stream of elementary sounds, but a hierarchically ordered network of sounds, motives, phrases, passages, sections, movements, etc.—i.e., time-spans whose perceptual boundaries are largely determined by the nature of the sounds and sound-configurations occurring within them" ("Temporal Gestalt Perception in Music" 205).

These differentiated time-spans as they occur on various structural levels Tenney calls Temporal Gestalt Units (or TGs, see Figure 1). Superficially, this differentiation into various structural levels bears resemblance to Heinrich Schenker's theory of tonal music. However, two significant features distinguish Tenney's conception from Schenker's. First, Tenney's theory works independent of specific materials (i.e., the tonality in Schenkerian analysis). Second, unlike Schenker's concept of fundamental line, any teleology observed through temporal gestalts springs from gestalt-forming factors (to be discussed later) rather than Tenney's interpretive lens.

Although many factors can contribute to the perception of a time-span as a temporal gestalt, Tenney suggests that each parameter—absolute pitch, register, rhythm, timbre, dynamics, etc.—be graphed independently as a function against time. The salient parameters vary from piece to piece and sometimes within a piece. As Tenney explains, "Whereas in earlier music the

Element	≈	a pitch or sound
Clang	≈	motive
Sequence	≈	phrase
Segment	≈	phrase group
Section	≈	section
Piece		

Figure 1. Approximate scale of temporal gestalt units with reference to traditional analytical terms

responsibility for the articulation of musical ideas was mainly given to the pitch parameter, the other parameters have begun to carry more and more of this responsibility, sometimes replacing the function of pitch altogether" (*Meta-Hodos* 18). As we will see, this isn't to say that the other parameters were latent in pre-twentieth century music, only that pitch played a significant role.

Without going into his arguments, Tenney proposes that TGs can be distinguished using factors similar to those used to distinguish visual gestalts (see *Meta-Hodos* §2): similarity, proximity, repetition, and so on.[5] Because Tenney views time and temporal gestalts as hierarchical, these features that determine TG boundaries are the same factors that dictate form—form being nothing more than temporal gestalts occurring on successively larger scales. According to Tenney, form in music comprises three distinct facets: shape, structure, and state. *Shape* refers to the parametric variation within a TG; *structure* refers to its internal relationships; and *state* refers to its overall, statistical properties.

Because temporal gestalts are perceived because of their differences, each of these aspects of form arise from contrast rather than unity (as form is often discussed, particularly in relation to the common-practice repertoire): "It is the differences between the successive elements of a clang, (and between the successive clangs of a sequence), which determine the form of the clang (or sequence)—not the similarities, although the latter usually constitute the primary factor of cohesion" (*Meta-Hodos* 58–59).

Tenney also notes that, in determining form, "the formative parameter in a given configuration is generally distinct from the cohesive parameter in that same configuration" (*Meta-Hodos* 64). This conclusion is, of course, a consequence of the factor of similarity. If a group of TGs are related by the same factor, they will be enmesh into a larger scale TG, and thus, that cohesive factor cannot be the one by which they derive their form.[6]

Form in *The Well-Tempered Clavier,* Book 1

Consequent to Tenney's framework, we must first address how Bach creates continuity in order to address how Bach creates form outside of textbook molds. Bach creates continuity primarily through motives but also through texture. Though the creation of continuity through motives happens in many of the preludes (the A-flat major prelude is a particularly clear example), this kind of continuity is most central to the functioning of the fugues, the genre being defined by the near ubiquity of the fugal subject. The effect of this continuity becomes clear in episodic passages, which effect will be further discussed in connection with how Bach uses contrast to create form.

While continuity by texture often occurs to unify sections of a piece, Bach uses it far less often to unify entire pieces. Though technically none of the pieces in Book One of *The Well-Tempered Clavier* exhibit a single texture all the way through, some of the preludes get close, and none comes closer than the Prelude in C major. In this prelude, the arpeggiation pattern that repeats every half note is disrupted only in the final three measures of the of the piece. In addition to the Prelude in C major, the Preludes in c minor, C-sharp major, D major, and d minor are also defined by their continuity of texture.

Because they place so many other variables on hold, these texture-defined pieces are a good starting point from which, having identified continuity, to examine form. In each of them, because the texture remains constant, we can easily examine how other aspects—notably harmony and register—help shape their form.

The harmony of the C major prelude has been well explored by a number of authors,[7] and put simply in temporal gestalt terms, the harmony is the shaping parameter of the prelude's form. However, register also plays a significant formal role. After the opening seven bars make

conspicuous use of the 2-line octave, the tessitura abruptly cuts out the high end of this octave in

measure eight and gradually settles into a straddling of the small and one-line octaves. For 26 out

of the piece's 35 measures, Bach avoids the initially prominent register. He eventually resolves this

asymmetry in a dramatic way by finally arpeggiating up to that octave in the penultimate measure

of the piece, allowing the hanging G" in bar 7 finally to step downward to F" in bar 34 and resolve

to E" in bar 35. Notably, Bach articulates this return to the initial register with the only textural

change in the entire piece. A close examination of this process reveals that Bach only uses the

2-line octave in places where the tonic harmony is upheld by a pedal tone. Almost as soon as we

begin to move away from the tonic, the 2-line octave vanishes, and it returns only once the pedal

C has been reestablished in the bass. Thus, in addition to the shaping role that harmony plays in

this prelude, register plays a strong structural one.

Inasmuch as they are shaped primarily by harmony, the other monotextural preludes

function similarly to the C major prelude; however, they are interesting in that in each case,

Bach—for various reasons—not only breaks the prevailing texture much further before the end

than he does in the C major prelude but also introduces many more shaping elements than were

in play in the C major prelude (see figure 2). In the c minor prelude, Bach has established a stable

relationship in which texture is the element of continuity and harmony is the element of change. By bar 21, the music arrives at the dominant pedal that usually signals the return to tonic. Here, however, Bach effects a total role reversal at bar 25. Bach continues the dominant pedal but replaces the prevailing superimposed compound-melody

Shape

(bar)	1	21	28	33	35	38
harmony	i $\rightarrow$ V			i?		I
tempo	fast		faster	slow	tempo 1	
texture	a	b	c	d	e	
register	C3	$\longrightarrow$		C2		

Structure

pedal C	1–6		33–38

Figure 2. Shape and structure in the Prelude in c minor

figure with an arpeggiated monophonic line. After three bars of this texture, he introduces both a textural and a tempo change for a further six bars, again, still grounded on dominant. Despite the consistency of harmony and surface rhythm that unites these bars with the first two-thirds of the piece, the changes textural and tempo push the piece far afield from its opening 24 bars.

Once the dominant pedal has spun itself out, Bach lands on the starkest tempo and textural change of the piece: an Adagio in a melody and accompaniment texture. At this point, he has returned to tonic in the bass, but as in the C major prelude, the harmony in the upper voices hasn't yet aligned with this pedal. This Adagio is also important because it provides an effective summary of the primary registral space in which the prelude has unfolded. In the final contrast of the piece, when the initial tempo and the sixteenth note surface rhythm return, Bach introduces the lower half of the great octave, ending the prelude on a flourish that covers nearly the entirety of the registral space spanned by the prelude, including the newfound great C.

Having explored preludes in which texture is largely constant, we can begin to examine other movements for the *The Well-Tempered Clavier* in which the formal relationship between texture, harmony, and register is more complex. Before we approach the intricacy of the fugues, a good halfway point is the Prelude in C-sharp major. While this prelude does have a steady surface rhythm, unlike the previously discussed preludes, this one actually has clear thematic material. Structurally, the prelude consists of three main components: the first, mm. 1–8; the second, mm. 31–35; and the third, mm. 63–74 (see figure 3). In the first two inven-

(bar)	1	9	17	25	31	35	39	43
theme	A	A	A	A	B	B	B	B
harmony	I	V	ii	vi	vi	ii	V	I

47	55	63	75	87	97	103
A	A	C	C'	C	Coda	Cadence
IV	I	V	seq.	V	V	V–I

Figure 3. Harmonic and thematic structure in the C♯ major Prelude. For a more full analysis, see example 1 in the appendix.

tions, Bach's fundamental conceit is the alternation of material between the right and left hands.

That conceit plays out on a larger level in the third invention in that its second iteration (m. 87) is

presented an octave down from its first presentation (m. 62).

Bach shapes the progress of the piece primarily by harmony and phrase length. In addition to having a textural conceit, the prelude also has a pervasive harmonic conceit, namely the circle of fifths. As the piece progresses, Bach presents progressively faster versions of the cycle in each of the three main inventions (see figure 4). At the same time, he decreases the repetitions of the sequential material and shortens the phrase

A	8 bars per region
B	4 bars per region
C'	2 bars per region

Figure 4. Harmonic shape in the C♯ major Prelude.

Sequence		V Pedal		Cadence	
AAAA	32				
BBBB	16				
AA	16				
		C	11		
C'	12				
		C	10		
		D	6		
				Cadence	2

Figure 5. Phrase-length shape in the C♯ major Prelude.

lengths of both the sequential material and of the dominant pedal (see figure 5). Consequently,

Bach builds great momentum to the final cadence.

Again using phrase-length and harmony to create formal shape, Bach creates a similar

effect in the fugue in c minor, although with a greater intricacy of design. (For a full analysis, see

example 2 in the appendix.) As traditional theory also explains, Bach structures the fugal subject around harmony. In contrast, the episodes are primarily structured around texture and motive (see figure 6). In con-

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T  T T E  T E  T E  T  EE   T   EE  TT
4  2 2 2  2 2  2 2  3  2  4.5     5.5

i (V)   i                                Thematic structure
i              III   V      (i) V   i    (harmony)

         A   B   C   AA      BA          Episodic structure
         ↑   E1::E4    ↑                 (texture + motive)
            ↑    E2,E1::E5    ↑
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Figure 6. Structures in the c minor fugue.

trast with the previously discussed preludes, the structure of this fugue is more difficult to hear, because the fugue contains two frequently alternating sections whose material is highly complex either melodically and texturally (the theme statements) or harmonically (the episodes).

Despite this structural complexity, the shape of the piece is fairly easy to hear and arises from its episodes (see figure 7). As in the Prelude in C-sharp major, Bach plays with phrase length

(bar)	5	9	13	17	22
phrase length	2	2	2	3	4.5
content	seq	imit	seq	seq	imit-seq
texture	cpt	cpt	hom	cpt	cpt

Figure 7. Episode shapes in the c minor fugue.

to give the fugue a sense of direction. In this case, the episodic phrases become longer until they roughly match the length of the initial presentation of the melodic material. In addition to the sense of direction created by phrase length, Bach also creates direction through the material he uses for his episodes, imitative and non-imitative sequences. After contrasting these types, he finally brings them together in the last episode. Underlying this sense of direction, Bach creates a sense of symmetry by having the central episode be a homophonic texture, incidentally the only homophonic texture in the entire fugue.

In contrast to the variety of phrase lengths in the c minor fugue, the B-flat major fugue is relentlessly even, consisting almost entirely of four-bar phrases, and with only two episodes, the fugue's main feature of interest is harmony. After twice presenting the theme in alternation between tonic and dominant, the dominant never again appears until measure 41 and isn't strongly emphasized till three measures before the double bar. Inasmuch as dominant pedals were prominent features in each of the four previously discussed pieces (and in Bach's music generally), the absence of one here makes this fugue a curiosity: how does Bach get away with avoiding tonic after the fugal exposition right until the final cadence?

The answer in part lies in a feature of the second dominant presentation of the theme (mm. 13–16). Immediately after this presentation, Bach repeats its final two bars, transposing them up a second and effecting a direct modulation to the submediant. Immediately afterward, Bach presents the first episode, whose function is to lead us to the dominant in the submediant region such that by measure 22, we are unquestionably in submediant. In addition to its role in affirming the modulation, the first episode works in concert with the second for another purpose: to give this modulation a sense of shape and direction. The first episode walks stepwise to the dominant of the submediant, and after two presentations of the theme, the second episode finishes the journey, going from the subdominant to the tonic (again, of the submediant region). The effect of these book ends is to emphasize the sense of harmonic parentheticalness to the abrupt deviation from the tonic region.

After the second episode, however, Bach still isn't ready to return to the tonic region and especially not to restate its dominant. He uses a circle of fifths (mm. 33–37, boxed in navy in example 3 in the appendix) both to overshoot the return to tonic and to create a compelling reason to use minor v (m. 36) rather than the expected dominant. In this bumpy return trip to the tonic, Bach uses a four-note motive (boxed in red) to guide our ear as the trip leads us out of the submediant region through the subdominant region and back to the tonic, significantly, whose return is highlighted by the initial return of the dominant. The return of the dominant doesn't last long, however, and is soon forgotten by the emphasis on tonic in the following two bars. It is at this point that Bach brings back the phrase extension idea from m. 17, this time to affirm the dominant and close out the piece. The effect of this usage is to throw greater relief on the memory of the jolting deviation to the submediant. The elegance of this formal shape becomes more striking when one observes how the rest of the fugue can be parsed into clear, four-bar phrases.

<u>Conclusion</u>

While *The Well-Tempered Clavier* contains many more preludes and fugues, from the previously discussed five we can already draw some interesting conclusions. Each of the pieces we examined derived their formal shapes from asymmetry—of phrase-length, of harmony, of textural rhythm, etc.[8] Bach uses his formal parameters in concert with each other to create asymmetrical shapes, the asymmetry of which imbues each piece an ex post facto sense of momentum and an aura of aliveness. Bach also tends to save his largest contrasts by transforming cohesive parameters into formal ones at the end of the individual pieces. Lastly, in the fugues, sequences and episodes are more than respites from thematic presentation. They are essential in creating formal shape, even if the nature of that contribution may vary from fugue to fugue.

Though the tonal shaping and structuring may not be as useful to some contemporary composers, many of these strategies can still be applied today. Asymmetry, particularly of phrase-lengths, seems to be a highly effective method of creating momentum. To use this tool, you'd have to create material that can be presented asymmetrically. Melodies, like the themes of Bach's fugues, wouldn't work well for this purpose. However, as the fugal episodes and the C-sharp major prelude show, harmonic progressions do work well for this purpose. These progressions needn't be a succession of bare chords either, but can embrace a variety of textures, as in the c minor fugue, and can be nested, as in the B material of the C-sharp major prelude. While I am inspired by these avenues of compositional exploration, it would be worthwhile to continue examining *The Well-Tempered Clavier* to see what other formal strategies Bach used. Regardless, it's clear from these initial analyses that powerful alternatives to traditional formal thinking exist, of which alternatives Bach's music holds many great examples.

End Notes

1. Laurence Dreyfus argues that "historical propriety, and with it . . . a plausible reconstruction of Bach's thought, is an indispensable component of analysis. In the simplest sense, historical propriety means avoiding explanations for a piece of music that one can assert to have been utterly inconceivable to the composer" (27). Even within this narrower scope, *The Well-Tempered Clavier* is well accounted for.

2. As John Cage remarks, "most musicians can't hear a single sound. They listen only to the relationship between two or more sounds. Music for them has nothing to do with their powers of audition, but only to do with their powers of observing relationships." (*Indeterminacy: Ninety Stories*)

3. As John Strawn writes in a review of Tenney's work, "The theory nicely avoids the ethnocentric pitfalls, often explicit, sometimes implicit, in much of European-based writings on music. The method does not impose an aesthetic in terms of which the music must be analyzed. Rather, the method analyzes music in terms of the music's own building blocks." ("*Meta + Hodos and META Meta + Hodos* by James Tenney," Computer Music Journal 11 (Winter 1987): 51).

4. For instance, in contrasting the ease with which tonal melodies are memorized with the challenge of corresponding atonal melodies, Jonathan Kramer remarks, "The lack of pattern . . . more than the alleged 'dissonance,' is why many listeners . . . have considerable difficulty understanding and remembering some kinds of modernist music" (336).

5. The two primary distinguishing factors for temporal gestalts are proximity and similarity. By proximity, Tenney means that elements group themselves by their spatial distribution. In music, this distribution happens in pitch space and in time.

By similarity, Tenney means that, given equal distribution, comparable elements will seem like independent groups. (See Figure 8.)

    In addition to these two primary factors,

Proximity: 000 00 0000 00 00000

Similarity: 000###0000##

Figure 8. The TG-deterimining factors of proximity and similarity are quite easy to understand from their visual equivalents.

Tenney identifies four additional ones influence TG perception: (1) *Intensity* is the relative position of a parameter with respect to time: e.g., rise and fall of a melody, increase in dynamics or tempo, shift from a mellow to a harsh timbre, etc. Where these parameters vary widely, the intensity peaks become focal points and the starting point of TGs (*Meta-Hodos* 41). (2) *Repetition* of a parametric profile tends to divide a whole into parts defined by the repetition, whether exact or approximate. (3) *Objective set* refers to those expectations created internally by a work. Tenney cites hemiola as an example effect produced by objective set. (4) Lastly, *subjective set* refers to those expectations that listeners bring to a work from their life experience.

6. Lawrence Dreyfus makes a similar observation in connection with Bach's *Inventio in C major* (BWV 772). After showing how the first seven notes of the piece form a motive (which he calls "X") that occurs in all but three bars of the piece, Dreyfus notes that "the C major Invention, one might say, is 'about' the subject called X." He continues: "This statement, however, becomes trivial if one considers all the occurrences of Subject X 'democratically.' While some belong to recognizably larger units that repeat during the composition, others form local patterns that figure far less prominently. One might even say that the recognition of X's omnipresence in the piece hinders an understanding of what Bach has done with it" (12).

7. Including those by Heinrich Schenker (see William Drabkin, "A Lesson in Analysis from Heinrich Schenker: The C Major Prelude from Bach's Well-Tempered Clavier, Book I," Music Analysis 4 (October 1985): 241–258) and Peter Schat ("The Reason for a Dream," *The Tone Clock* (Amsterdam: Harwood Academic Publishing, 1993), 11–23).

8. The prelude in C major being the crowning example of this last feature: 32 bars of one consistent texture followed by a mere 3 of a different one.

Appendix: Musical Examples

Example 1: Prelude in C♯ major

Example 1: Prelude in C♯ major (continued)

FUGA II.

Example 2: Fugue in c minor

Example 2: Fugue in c minor (continued)

FUGA XXI.

Example 3: Fugue in B♭ major

Example 3: Fugue in B♭ major (continued)

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