

# Keyboard Technique as Contrapuntal Structure in J. S. Bach's Clavier Works\*

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The concept of *inventio* has received much attention in the theory and analysis of eighteenth-century composition, particularly in Bach studies. Since Laurence Dreyfus' seminal contributions, and at variance with his own nuanced approach to the topic, *inventio* is often seen as the essential category of musical thought and creation, and is set in opposition to *dispositio*.<sup>1</sup> The procedures which generate sections of music from an initial idea (*inventio*) are viewed as more important for understanding the musical structure of the music than the order (*dispositio*) in

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<sup>1</sup> The *locus classicus* is Laurence Dreyfus, *Bach and the Patterns of Invention* (Cambridge, MA: Harvard University Press, 1996); other important expositions are Dreyfus, 'Bachian Invention and its Mechanisms', in John Butt (ed.), *The Cambridge Companion to Bach* (Cambridge University Press, 1997), 171–92 and 'J. S. Bach's Concerto Ritornellos and the Question of Invention', *Musical Quarterly*, 71/3 (1985), 327–58. For analytic approaches to *inventio* in the *Inventions*, BWV 772–786, see Ellwood Derr, 'The two part inventions: Bach's composers' vademecum', *Music Theory Spectrum*, 3 (1981), 26–48; Michaela Corduban, 'La rhétorique des idées musicales dans les Inventions à deux voix de Jean-Sébastien Bach: Proposition d'un modèle analytique', *Musurgia*, 12/1 (2005), 9–34; and Olli Väisälä, 'Bach's Inventions: Figuration, Register, Structure, and the "Clear Way to Develop Inventions Properly"', *Music Theory Spectrum*, 31/1 (2009), 101–52. For the concept of *inventio* in keyboard music generally, see Darrell Berg, "'Das Verändern ... ist ... unentbehrlich": variation as invention in C. P. E. Bach's keyboard music', in Paul Corneilson and Peter Wollny (eds.), *Er ist der Vater, wir sind die Bub'n: Essays in Honor of Christoph Wolff* (Ann Arbor: Steglein Publishing, 2010), 20–42; Laurenz Lütteken, 'Inventio und Varietas: Anmerkungen zur Intention des Wohltemperierten Claviers', in Volker Kalisch (ed.), *Bachs Wohltemperiertes Klavier in Perspektiven* (Essen: Die Blaue Eule, 2002), 11–28; and Christoph Wolff, 'Invention, Composition and the Improvement of Nature: Apropos Bach the Teacher and Practical Philosopher', in Christopher Hogwood (ed.), *The Keyboard in Baroque Europe* (Cambridge: Cambridge University Press, 2003), 133–9. Two important studies of *inventio* in vocal music are Don Franklin, 'Konvention und Invention in Kantate 46: Johann Sebastian Bachs Kantate für den 10. Sonntag nach Trinitatis', *Arolser Beiträge zur Musikforschung*, 7 (1999), 181–206 and László Somfai, 'Inventio és elaboratio J. S. Bach zenéjében: Szélsőjegyzetek vokális töredékekhez [Inventio and elaboratio in the music of J. S. Bach: Remarks on vocal fragments]', *Zenetudományi dolgozatok* (1999), 257–73. Karol Berger addresses *inventio* in Bach's vocal music in *Bach's Cycle, Mozart's Arrow: An Essay on the Origins of Musical Modernity* (Berkeley: University of California Press, 2007); Berger's book is also important for its treatment of *inventio* from philosophical and cultural perspectives.

which those sections ultimately appear in the finished composition.<sup>2</sup> This perspective can account in an appealing way for how large-scale musical form arises given a strict economy of material, as in Bach's musical language: strict derivation (e.g. of counterpoint) generates, parses, and relates formal constituents, while the economy of the material integrates and unifies these constituents.<sup>3</sup> Likewise the large-scale tonal plan of a composition may result from polyphonic procedures with respect to the basic *inventio*, not the succession of harmonies in their own right.<sup>4</sup> In short, the form of a work by Bach is understood to be independent of the temporal sequence of events. Instead, the form inheres in the 'logical' (that is, derivational) relationships among the formal constituents; the position of these constituents—temporally or tonally, relative to each other or with respect to the whole—is secondary.<sup>5</sup>

Notwithstanding the importance of these perspectives for analysis of Bach's musical forms, the relationship between *inventio* and *dispositio* remains problematic.<sup>6</sup> Although he did not use these terms, Donald Francis Tovey suggested a rapprochement between *inventio* and *dispositio*—albeit in characteristically allusive and elliptical tones:

Are there any pieces of music so constructed that a complete definition of their form will account for every note? Would not such pieces achieve the theoretical ultimate possibility in the way of strictness? Strange to say, this is no mere theoretical possibility. When Bach writes a piece in which a known chorale-tune is treated by several parts in close fugue, phrase by phrase, while another part gives out the phrases in their order, in long notes at regular intervals, this form actually does prescribe for most of the notes in the whole piece, and the exigencies of counterpoint seem to determine the remaining notes. Such a form is a not unreasonable exercise for students; and a student's exercise appears to differ from Bach's in no discoverable matter of form. But whereas the student is proud to achieve grammatical correctness, Bach's chorale-fugue [i.e. cantus-firmus chorale prelude with *Vorimitation*] is a masterpiece of rhetoric. Now if we are correct in our view that an art form grows from within instead of being moulded from without, then it ought to

<sup>2</sup> See Dreyfus, *Bach and the Patterns of Invention*, 27–9 and Berger, *Bach's Cycle*, 95–6.

<sup>3</sup> Dreyfus, *Bach and the Patterns of Invention*, 14–22.

<sup>4</sup> Berger, *Bach's Cycle*, 95–6. For a discussion of the intellectual antecedents of Berger's view, see Gergely Fazekas, 'J. S. Bach and the Two Cultures of Musical Form', *Understanding Bach*, 10 (2015), 109–12.

<sup>5</sup> Some recent writings that take up the issue of *dispositio*, either tacitly or explicitly, include: Stefan Orgass, 'Disposition und Ausarbeitung in Bachs späten Clavier-Werken (1739–1749)', PhD diss., Folkwang Hochschule Essen, 1995; Gergely Fazekas, 'Inventio vs. dispositio: A bachi fuga à la zenei forma [Inventio vs. dispositio: Bach's fugues and musical form]', *Magyar zene: Zenetudományi folyóirat*, 47/2 (2009), 147–61; Joseph Kerman, *The Art of Fugue: Bach Fugues for Keyboard, 1715–1750* (Berkeley: University of California Press, 2005); and Mark Anson-Cartwright, 'Subdominant Returns in the Vocal Music of J. S. Bach', *Eighteenth-century Music*, 10/2 (2013), 253–76.

<sup>6</sup> This concern has been raised by Stephen A. Crist, 'Review of Bach and the Patterns of Invention by Laurence Dreyfus', *Journal of the American Musicological Society*, 52/3 (1999), 631 and Karl Braunschweig, 'Review of Bach's Works for Solo Violin: Style, Structure, Performance by Joel Lester; Bach and the Patterns of Invention by Laurence Dreyfus', *Theory and Practice*, 26 (2001), 126.

be possible to regard Bach's choral fugue [sic] as having reached its strict form by inner rhetorical necessity. And again this is no abstract absurdity. Bach wrote two entirely different strict chorale-fugues on *Aus tiefer Not* [i.e. BWV 686 and 687 from *Clavier-Übung III*] ... The practical fact that Bach must have known beforehand that his art form was going to be so strict has nothing to do with the principles that guided him to prefer the better rhetoric of two equally strict and correct turns of harmony.<sup>7</sup>

*Inventio* 'account[s] for every note' since strict derivation 'prescribes for most of the notes' on the basis of the given idea and 'the exigencies of counterpoint determine' the rest. But as Tovey points out, *inventio* cannot account for the difference between a student exercise and the work of a master composer, nor between two different works by the same composer based on the same basic *inventiones*. In the former case, the master composer's inventions surpass the student's in the rhetoric of their arrangement 'phrase by phrase ... in order.' In the latter case, not only is the rhetoric of the disposition what distinguishes two works on the same basic material, but moreover this different rhetoric actually guides the composer in discriminating between 'two equally strict and correct turns of harmony' – that is, a local compositional choice can be made on the basis of larger formal considerations. Thus the stark and ostensibly simple distinction between *inventio* and *dispositio* is blurred: the overall disposition can be a result of the basic inventions on the subject, but equally the disposition as a compositional idea in itself can constrain or motivate the inventions which give rise to a subject in both its basic and manipulated forms.<sup>8</sup>

Perhaps the focus on *inventio* stems in part from the appealing way in which it can systematise derivational operations as a set of basic, abstract, and iteratively applied operations.<sup>9</sup> In particular, contrapuntal manipulations – both on account of their strictness and pervasiveness in Bach's language – are those that have been seized upon and valorised. In this view, musical material serves to instantiate some abstract contrapuntal property.<sup>10</sup> But as Stephen Crist has pointed out:

[abstract operations] should be taken *cum grano salis*. [E]ven for such a highly rational composer as Bach, the creative process was not nearly so tidy ... One of the great paradoxes of human creativity is that such orderly works of art can issue from the chaotic, overlapping, and sometimes contradictory thought processes each one of us experiences every day.<sup>11</sup>

<sup>7</sup> Donald Francis Tovey, 'Some Aspects of Beethoven's Art Forms', in *Essays and Lectures on Music* (Oxford: Oxford University Press, 1949), 296–7.

<sup>8</sup> Although deployed for different purposes, some of the language I use here is borrowed from Braunschweig, 'Review of Bach's Works for Solo Violin', 127.

<sup>9</sup> On 'musical economy' as a tacit value in musicological writings, see Janet Levy, 'Covert and Casual Values in Recent Writings on Music', *The Journal of Musicology*, 5/1 (1987), 3–27 at 7f.

<sup>10</sup> Daniel Harrison's study of triple counterpoint, the most thorough-going of its kind, shows this tendency in the extreme; see Daniel Harrison, 'Some Group Properties of Triple Counterpoint and Their Influence on Compositions by J. S. Bach', *Journal of Music Theory*, 32/1 (1988), 23–49. Similarly, Berger goes so far as to define a fugue as 'demonstrations of what can be done with a subject contrapuntally' and coins 'demonstration' as an analytic term; see *Bach's Cycle*, 89–91.

<sup>11</sup> Crist, 'Review of Bach and the Patterns of Invention by Laurence Dreyfus', 632.

The emphasis on creative process and everyday experience over abstraction is a promising direction. Rather than focusing on the abstract permutational structure of musical material by describing its derivation in terms of disembodied, purely conceptual operations, could analysis account also for the material's rhetorical or technical design, use, and performance?

This article will take up the issue of *dispositio* and embodied experience in the context of the analysis of invertible counterpoint. I hope to show that the invention and disposition of invertible counterpoint in J. S. Bach's keyboard music can also be understood as controlled by considerations of the kinaesthetics of keyboard technique. The counterpoints are not solely the results of abstract operations but are shaped by the very concrete physical gestures of keyboard playing. As such, they can be understood in relation to the mechanics of the hands on the keyboard and are constrained by the physical limitations of the body. This analytic approach challenges a too sharp distinction between *inventio* and *dispositio* in compositional practice. Close analysis of invertible counterpoint, particularly triple counterpoint in Bach's clavier music, shows that the disposition of contrapuntal parts under the fingers motivates the successive, ordered arrangements ('dispositions') of contrapuntal modules ('inventions') across the course of a piece. This demonstrates the importance of *dispositio* as a locus of compositional activity in principle [theory]; in turn, considering the importance of *dispositio*—especially when it seems to meld indeterminately with *inventio*—helps to explain some of Bach's specific compositional choices in a given work [analysis].

## Keyboard pedagogy and compositional technique

As is well known, the *Inventions* and *Sinfonias* are first and foremost pedagogical pieces, an 'Honest Guide' to keyboard performance and composition.<sup>12</sup> The title page of the 1723 autograph of the *Auffrichtige Anleitung* proposes the progressive study through performance of two—and three-part compositions whereby the student may attain the art of 'clean' and 'correct' playing and a 'foretaste of composition.'<sup>13</sup> More than pursuing performance and composition simultaneously,

<sup>12</sup> The *Inventions* and *Sinfonias* were originally copied into the *Clavierbüchlein* (US-NH, Music Deposit 31) for the twelve-year-old Wilhelm Friedemann in c.1722; Bach produced a fair copy (D-B, Mus. ms. Bach P 610) in 1723, which served as the model for students' copies, the most important early ones being Bernhard Christian Kayser's copy (D-B, Mus. ms. Bach P 219) in around 1723/4 and Heinrich Nikolaus Gerber's copy (NL-DHnmi, NMI Kluis F Bach-dooos n) in 1725. These pieces remained a mainstay of Bach's pedagogy throughout his life, and continued to be copied: Johann Christian Kittel, one of Bach's last students, completed his copy (D-B, Mus. ms. Bach P 1067-8) after 1750. For further details on the sources, see *NBA KB V/3*.

<sup>13</sup> The title page of P 610 reads in full: 'Auffrichtige Anleitung, Wormit [*sic*] denen Liebhabern des *Claviers*, besonders aber denen Lehrbegierigen, eine deutliche Art gezeigt wird, nicht alleine (1) mit 2 Stimmen reine spielen zu lernen, sondern auch bey weiteren *progrefzen* (2) mit dreyen *obligaten Partien* richtig und wohl zu verfahren, anbey auch zugleich gute *inventiones* nicht alleine zu bekommen, sondern auch selbige wohl durchzuführen, am allermeisten aber eine *cantabile* Art im Spielen zu erlangen, und darneben einen starcken Vorschmack von der *Composition* zu überkommen.' See *NBA V/3*, 1. For a discussion of the significance of this title, see Christoph Wolff, 'Invention, composition and the improvement of nature', 133-9 and Christoph Wolff, 'Miscellanea musico-biographica zu Johann Sebastian Bach', in Ulrich Leisinger (ed.), *Bach in Leipzig – Bach und Leipzig: Konferenzbericht Leipzig 2000*, Leipziger Beiträge zur Bach-Forschung, 5 (Hildesheim: Georg Olms, 2002), 444-7.

Bach argues that these are mutually reinforcing skills. On the one hand, the collection is a graded series of pieces whereby the student can learn first 'to play cleanly in two parts' and then 'also correctly and well in three obbligato parts' in the 'cantabile style', emphasising the independence of equal, 'singing' contrapuntal parts.<sup>14</sup> On the other hand, through the performance of these pieces in this manner the student will learn 'not only to obtain good musical *inventiones*, but to carry them out well [*wohl durchzuführen*].' *Durchführen* has the dual sense of realising the text of a composition in the course of performance, as well as realising in the course of composition the full implications of the basic *inventio*.

In this connection, the use of the distinct terms *Inventio* and *Sinfonia*, which Bach added in the 1723 fair copy, is not arbitrary. As David Schulenberg has observed, the *Inventiones* are typically cast in 'abstract', 'free forms' while the *Sinfonias* 'forms [are] based on division of the whole into roughly equal sections, including a bipartite type in which each half is subdivided'.<sup>15</sup> In this way the *Sinfonias* reveal Bach's attention to *dispositio* as a compositional parameter in its own right, as a way of organising the relatively greater complexity of *inventiones* in three voices than in two.<sup>16</sup>

This then is how the *Auffrichtige Anleitung* offers a 'foretaste' of composition: the pieces demonstrate the process of composing with progressively greater complexity, and their performance provides a means for the student to imitate and rehearse this process.<sup>17</sup> Thus the collection grounds musical composition in performance. Viewed from this perspective, *inventio* cannot be said to exert priority over the temporal aspects of a piece's formal *dispositio* (which, to repeat, includes the temporal sequence of material and the large-scale harmonic plan of the composition). Quite the contrary, since performance is essentially diachronic (unlike the synchronic relationships which the score might be supposed to map) Bach's compositional model encompasses on equal footing the invention of basic musical materials, the disposition of the musical form, and—in the pedagogical

<sup>14</sup> David Ledbetter, *Bach's Well-tempered Clavier: The 48 Preludes and Fugues* (New Haven: Yale University Press, 2002), 137–8. This is the style of four-part writing to which C. P. E. Bach referred in a letter to Forkel: 'Besonders drang er sehr starck auf das Aussetzen der Stimmen im General-Baße'; see *BDok* III, no. 803. For two differing English translations, see NBR, 398ff and Stephen L. Clark (ed.), *The Letters of C. P. E. Bach* (Oxford: Clarendon Press, 1997), 72f.

<sup>15</sup> David Schulenberg, *The Keyboard Music of J. S. Bach*, rev. edn (New York: Routledge, 2006), 188 and 195. This is not to say that *Inventio* and *Sinfonia* are to be understood to refer to specific genres or forms themselves, but rather that their approaches to form and genre are different, and correlated to the number of parts. On the significance of these terms, see also *NBA KB V/3*, 87 and Günther Wagner, *Traditionsbezug im musikhistorischen Prozeß zwischen 1720 und 1740 am Beispiel von Johann Sebastian und Carl Philipp Emanuel Bach: Musikalische Analyse und musikhistorische Bewertung* (Neuhausen-Stuttgart: Hänssler-Verlag, 1985), 14–42.

<sup>16</sup> This is consistent with Peter Wollny's observation that Bach's adoption of the terms *Inventio* and *Sinfonia* (which appear first in D-B, Mus. ms. Bach P 610, not in the *Clavierbüchlein vor Wilhelm Friedemann Bach*) is connected to his clarifying the didactic principles of the collection. *NBA KB V/3*, 88.

<sup>17</sup> The conception of these pieces as a progressive didactic set is already apparent from their order in the *Clavierbüchlein* for W.F. Bach, which proceeds from simple motivic imitation (BWV 772, 775, 778, 779, 781, 784, 786, and 785) to the treatment of subjects and countersubjects in melodic and contrapuntal inversion (BWV 783, 782, 780, 777, and 776), culminating in canon and fugue (BWV 776, 774, and 773). For further discussion, see *NBA KB V/5*, 69ff.

context of keyboard music—the physical choreography of the technique necessary to bring the piece off.<sup>18</sup>

### The simple case: double counterpoint

The principle of invertible counterpoint, so fundamental to Bach's art, was not withheld from this essential primer; indeed Wilhelm Friedemann and Carl Philipp Emanuel Bach studied these pieces from the age of about ten or younger and through them laid the foundation of their compositional technique.<sup>19</sup> The Invention No. 8 in F major, BWV 779, deals rigorously with the technique of strict double counterpoint, already intimated in earlier Inventions.<sup>20</sup> With the exception of just a few beats—at the two major cadences in bars 10–11 and 32–33 where fifths are necessary to produce good bass motion and clear harmony—the composition relies exclusively on imperfect consonances and octaves. Example 1 shows my inversion of the F-major invention with the necessary adjustments at the cadences; this could easily be played at sight from the prime form of the invention (i.e. Bach's own composition), and it is hard to imagine that the contrapuntal permissibility of this brain- and finger-exercise would have gone unnoticed by Bach or his students. Notably, it is only in those cadential passages where Bach must forgo invertibility that he also allows some accented passing dissonances which produce poor, if not exactly wrong, counterpoint in inversion. (These infelicities are emended as the small notes in Example 1.) Thus his adherence overall to the limited intervallic palette of thirds, sixths, and octaves, is most readily explained if invertibility is not merely a feature but precisely the point of the piece.

Example 1 also highlights the invention's play on the possible ambiguity between contrapuntal inversion (intervallic displacement; at the octave in this case) and canon (temporal displacement; at the measure in this case).<sup>21</sup> The first

<sup>18</sup> The opposing view is developed in Dreyfus, *Bach and the Patterns of Invention*, 27–32. Dreyfus is concerned to provide an alternative to analysis that seeks only to account for a work's 'external form', an endeavor he considers 'anachronistic.' Dreyfus' marks are Schenkerian *Ursätze* and Marxian *Formenlehre*, the application of which to Bach's music he considers 'a futile exercise in organicism' that 'elevates the ancillary category of disposition'. Certainly those approaches have certain limits when applied to Bach's music; nevertheless their concerns for architectonic aspects for large-scale form (i.e. *dispositio*) could still be relevant for understanding the relations between Bach's musical materials and his forms. For the notion of the choreography of keyboard counterpoint, see David Yearsley, *Bach's Feet: The Organ Pedals in Popular Culture* (Cambridge: Cambridge University Press, 2012), 104.

<sup>19</sup> *NBA V/3, v*, *NBA KB V/3*, 89–91 and *NBA KB V/5*, 70. See also Hans-Günter Ottenberg, *Carl Philipp Emanuel Bach*, trans. Philip J. Whitmore (Oxford: Oxford University Press, 1987), 9 and Wolff, 'Miscellanea Musico-biographica', 445.

<sup>20</sup> The particular significance of BWV 779 to Emanuel and Friedemann Bach's early compositional training is addressed by Wagner in *Traditionsbezug im musikhistorischen Prozeß*, 48f.

<sup>21</sup> Canon and invertible counterpoint were often conceived in the eighteenth century as two aspects of the same *ars combinatoria*; the connection is perhaps most immanent in stretto. In the Fugue in A major, BWV 864/2, from *WTC I*, Bach explores these relationships in more elaborated harmonic contexts than he does in the self-consciously introductory F-major invention. On BWV 864/2, see David Yearsley, *Bach and the Meanings of Counterpoint* (Cambridge: Cambridge University Press, 2002), 45–8; on the connection between canon and invertible canon, see *ibid.*, 73–85; on stretto, see *ibid.*, 183–8.

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Example 1: Invention No. 8 in F major (BWV 779), inverted

six bars in Example 1 are, equivalently, both an inversion of Bach's first six bars, and a canonic manipulation wherein the bottom voice rather than the top voice is the *dux*. Contrapuntal inversion and canonic phasing are equivalent in this case because the harmony is static, elaborating a simple triad for bars 1–5. (Bar 6 is ambiguous in this way too, although the harmony has changed.) Canon is fundamentally a temporal, successive phenomenon; in this way this piece illustrates the conceptual link from *inventio* to *dispositio*.

Contrapuntal inversion in BWV 779 is not just an abstract compositional conceit but serves the collection's performance pedagogy by choreographing the disposition of the hands on the keyboard via thorough-going inventions on a basic idea. Since a double counterpoint obviously has only two combinations, at the keyboard this simply means the exchange of material between the hands. Double counterpoint in composition is therefore analogous to ambidexterity in performance, a basic skill of the keyboard art emphasised especially in organ and thoroughbass pedagogy.<sup>22</sup> There is no particular reason for viewing either of these analogues as subsidiary: just as ambidexterity is necessary to perform contrapuntal inversion, so double counterpoint instantiates the corresponding physical gesture of inversion at the keyboard.

### Types of invertible counterpoint

As far as I am aware, Daniel Harrison is the only scholar to have published a systematic study of Bach's use of invertible counterpoint.<sup>23</sup> His study considered only triple counterpoint at the octave, not double counterpoint or inversion at intervals other than the octave. This in itself is quite reasonable: double counterpoint is just too common a phenomenon in Bach.<sup>24</sup> But unfortunately Harrison justified the necessary restriction of his scope by supposing an essential difference between triple and double counterpoint. He writes:

The reader might well ask why a study of Bach's use of double counterpoint is not prerequisite [for the study of triple counterpoint]. The answer lies in the different abstract structure of these two types of invertible counterpoint and the effect these differences have on compositional procedure.<sup>25</sup>

<sup>22</sup> The *Vorschriften und Grundsätze zum vierstimmigen spielen des General-Bass* of 1738, attributed to Bach, is but one example; see Pamela Lee Poulin (ed. and trans.), *J. S. Bach's Precepts and Principles for Playing the Thorough-Bass or Accompanying in Four Parts (Leipzig, 1738)* (Oxford: Clarendon Press, 1994).

<sup>23</sup> Harrison, 'Some Group Properties of Triple Counterpoint'. Other important studies which include analyses of Bach's counterpoints are Peter Franck, 'The Role of Invertible Counterpoint within Schenkerian Theory', PhD diss., Eastman School of Music, 2007 and "'A Fallacious Concept": Invertible Counterpoint at the Twelfth within the *Ursatz*', *Music Theory Spectrum*, 32/2 (2010), 121–44. I thank Paul V. Miller for these latter two references.

<sup>24</sup> As Harrison observes, inversion at intervals other than the octave (principally at the tenth and at the twelfth), while common in double counterpoint, is rare in triple counterpoint. Harrison, 'Some Group Properties of Triple Counterpoint', 24. See also note 30.

<sup>25</sup> *Ibid.*, 23–4.



There are two problems with this line of reasoning. The first is that it conflates the number of parts in the composition with the number of contrapuntally invertible parts. These are independent: double counterpoint may exist in three or more voices, as in Example 2; triple counterpoint may be operable in four or more voices (Example 3), or even in two voices if one of three implicit voices is suppressed or where one of two explicit voices exhibits compound melody (Example 4).



Example 2: Double counterpoint in three voices in Sinfonia No. 3 in D major (BWV 789), bb. 8-9



Example 3: Triple counterpoint in four voices in Fugue No. 4 in C-sharp minor, WTC I (BWV 849/2), bb. 73-75



Example 4: Triple counterpoint in two voices in Sinfonia No. 3 in D major (BWV 789), bb. 1-2

The second and more crucial problem is that it draws too neat a correspondence between compositional procedures and the complexity of music so composed. Since triple counterpoint potentially has a more complex structure than double counterpoint, it is supposed that it must therefore have a different compositional procedure. Eighteenth-century theorists, by contrast, describe double and triple counterpoint as being composed using the same basic techniques, notwithstanding the latter's greater complexity. Johann Gottfried Walther's *Praecepta der musicalischen Composition* (1708) dispenses with the compositional procedures for triple counterpoint by stating summarily 'the same principles laid out above [on double counterpoint] should be followed'.<sup>26</sup>

<sup>26</sup> 'Drey Subjecta zuverfertigen deren jedes *pro fundamento* soll gebraucht werden, müssen gleichfalls die anfängl[ichen] angeführten Lehr-Sätze [on double counterpoint] *observiret* werden.' Johann Gottfried Walther, *Praecepta der Musicalischen Composition* [1708], ed. Peter

Walther's *Musikalisches Lexicon* (1732), although it has more than 3,000 entries, has no entry for *contrapunctus triplex* or the like; rather triple counterpoint is mentioned briefly under the entry for *contrapunctus duplex*.<sup>27</sup> Mattheson cites triple and quadruple counterpoints not as typologically distinct but as special examples of double counterpoint or 'double fugue' (i.e. double counterpoint in which one of the voices is derived from the other, canonically or otherwise).<sup>28</sup>

Thus eighteenth-century theorists conceived of musical structure as *how* the music is composed, rather than *what* it looks like once composed. From this perspective, double and triple counterpoint are of the same type. Accordingly, Friedrich Wilhelm Marpurg writes:

When three various voices can be rearranged with respect to each other in such a way that each can stand as the first, second, or third voice, that is, that each can stand as the discant, middle-voice, or bass: one calls such a composition a triple counterpoint. The composition of such a counterpoint can be accomplished according to the rules of double counterpoint either at the octave alone, or also by other kinds of double counterpoint, namely mixed [i.e. double counterpoint at the tenth or the twelfth].<sup>29</sup>

Bach was certainly no stranger to counterpoint at the tenth or the twelfth.<sup>30</sup> Yet the compositional procedures, and therefore the general structural principles, of these types of complex counterpoints are not specific to them.

Benary, *Jenaer Beiträge Zur Musikforschung*, 2 (Leipzig: Breitkopf & Härtel, 1955), 204–5. On the intellectual and cultural context from which spring Walther's *Praecepta* and the other theoretical treatises cited here, see Yearsley, *Bach and the Meanings of Counterpoint*, chapter 2, 'The Alchemy of Bach's Canons', *passim*.

<sup>27</sup> Johann Gottfried Walther, *Musikalisches Lexikon oder Musicalische Bibliothec, Darinnen nicht allein Die Musici, welche so wol in alten als neuern Zeiten, ingleichen bey verschiedenen Nationen, durch Theorie und Praxin sich hervor gethan, und was von jedem bekannt worden, oder er in Schrifften hinterlassen* (Leipzig: Wolfgang Deer, 1732), 182 s.v. *contrapunctus duplex*.

<sup>28</sup> Johann Mattheson, *Der Vollkommene Capellmeister, Das ist Gründliche Anzeige aller derjenigen Sachen, die einer wissen, können, und vollkommen inne haben muß, der einer Capelle mit Ehren und Nutzen vorstehen will* (Hamburg: Christian Herold, 1739), 793–4.

<sup>29</sup> 'Wenn drey verschiedene Stimmen dergestalt unter einander verwechselt werden können, daß eine jede zur ersten, andern oder dritten werden kann, das ist, daß jede zum Diskant, zur Mittelstimme oder zum Basse werden kann: so nennet man eine solche Composition einen dreydoppelten oder dreyfachen Contrapunct. Die Ausarbeitung eines solchen Contrapuncts kann entweder nach den Regeln des doppelten Contrapuncts in der Octave allein, oder zugleich nach andern Arten des doppelten Contrapuncts, d[as] i[st] vermischet geschehen.' Friedrich Wilhelm Marpurg, *Abhandlung von der Fuge, nach dem Grundsätzen der besten deutschen und ausländischen Meister* (Berlin: A. Haude and J. C. Spener, 1754; repr. Hildesheim: Georg Olms, 1970), vol. II, 5.

<sup>30</sup> Well-known examples from among the clavier works are *Contrapunctus IX alla duodecima* and *Contrapunctus X alla decima* from *The Art of Fugue* (BWV 1080), and the G-minor fugue from *WTC II* (BWV 885/2), which employs inversion at the octave, tenth, and twelfth in various combinations. Inversion at the tenth and twelfth are not usually used independently but, as Marpurg says, are used in conjunction with inversion at the octave, hence the description of these as 'mixed'. Mixed double counterpoint therefore has more than the two arrangements of double counterpoint at the octave. For example, double counterpoint at the octave and the tenth has four arrangements. The number of possible arrangements in mixed tripled counterpoint are therefore proportionally much greater—for example, as many as twelve in

For Harrison, it seemed that 'Bach recognised' the particular mathematical properties of multiple counterpoint and 'exploited ... their latent structural potentialities.'<sup>31</sup> Harrison's analyses from this perspective, while productive, do not account for compositional process or performance context inasmuch as an eighteenth-century musician probably would not have conceptualised the music in terms of the mathematical structures invoked. As C. P. E. Bach wrote to Forkel in 1775, 'The deceased [J. S. Bach], like myself and all true musicians, was no lover of dry, mathematical stuff.'<sup>32</sup> Instead, the prevailing intellectual and analytic perspective of the eighteenth century was the thoroughbass.<sup>33</sup> This was the apparatus with which musical structure, including contrapuntal structure, was understood. For keyboard composers like Bach, the thoroughbass was equally practical and conceptual, foundational in both performance and composition. Through the thoroughbass, contrapuntal thinking and keyboard technique are two sides of the same coin.<sup>34</sup>

triple counterpoint at the octave and tenth—but unsystematic, since in such complex counterpoints certain of the arrangements often turn out to be contrapuntally or aesthetically unviable. Besides, mixed triple counterpoint is rare (see note 24).

<sup>31</sup> Harrison clarified that he would hardly wish to 'intimate that Bach anticipated by almost a century the development of mathematical group theory'. Harrison, 'Some Group Properties of Triple Counterpoint', 47.

<sup>32</sup> *NBR*, 398; *The Letters of C. P. E. Bach*, 72; *BDok III*, no. 803.

<sup>33</sup> In the same letter, C. P. E. Bach wrote, 'The realisation of a thoroughbass and the introduction to chorales are without a doubt the best method of studying composition, as far as harmony is concerned. As for the invention of ideas, he required this from the very beginning, and anyone who had none he advised to stay away from composition altogether.' *Ibid.*

<sup>34</sup> Although mediated by the thoroughbass in the eighteenth century, the codependence of contrapuntal thought and keyboard technique by no means requires the thoroughbass; indeed, the former precedes the latter historically. For a discussion of contrapuntal thinking through the body at the keyboard in the sixteenth century, see David Yearsley, *Bach's Feet*, 75–86. Rather, it would appear that the necessary condition is a compositional framework which accommodates the conceptualisation of successions of contrapuntal intervals. The techniques of simultaneous harmonic composition (as opposed to successive tenor-discant composition) would have provided this means in the sixteenth century; see *ibid.*, 102–4. The historical connection between simultaneous harmonic composition and thoroughbass deserves further study.

## The concept of ‘inversion’ (*Verkehrung*<sup>35</sup>) in thoroughbass and counterpoint

It is an inevitable consequence of the fact that people have two hands that double counterpoint might take the form of trading musical material between the hands. Attention to this basic physical fact can suggest possibilities for the pedagogical function of pieces in double invertible counterpoint, as suggested above. Yet the effect of these physical constraints on compositional practice is not so evident in double counterpoint, since the relationship between hands and counterpoint is straightforward. In triple counterpoint, the number of voices and hands do not correspond one-to-one; yet the physical constraint of two-hand playing is still applicable. Because of this, the effect of two-handedness on the structure of counterpoint is more readily discernible in triple counterpoint.

Triple counterpoint admits of six possible inversions, or contrapuntal interchanges. Marpurg’s characterisation of these interchanges, quoted above, is that each voice can be disposed in each position of the texture. This produces two distinct sets of three interchanges in which each voice is in each position of the texture exactly once; see Illustration 1.<sup>36</sup>

Illustration 1: Six arrangements of triple counterpoint, in two groups

I.			II.		
A	C	B	B	A	C
B	A	C	A	C	B
C	B	A	C	B	A

<sup>35</sup> *Verkehrung* is the most commonly used term for ‘inversion’ in discussions both of thoroughbass (harmony) and of counterpoint; *Verwechslung* and *Umkehrung* are used occasionally. In the context of thoroughbass *Verwechslung* indicates chord ‘inversion’, not in the modern sense of bass inversion but in the sense of the disposition of the right hand (*Akkord*) for a given figured bass note. For example, Johann David Heinichen, *Der General-Bass in der Composition, oder, Neue und gründliche Anweisung...* (Dresden: author, 1728) and Friedrich Wilhelm Marpurg, *Handbuch bey dem Generalbasse und der Composition: mit zwey, drey, vier, fünf, sechs, sieben, acht und mehrern Stimmen; nebst einem vorläuffigen kurzen Begriff der Lehre vom Generalbasse für Anfänger* (Berlin: Schütze, 1757) use the term this way; see these treatises’ respective indices for specific occurrences. Sometimes *Verwechslung* means chord inversion in the modern sense in writings of German theorists influenced by Rameau, as for example Johann Adolph Scheibe, *Compendium musices theoricopracticum* (Leipzig, c.1730; reprinted in *Die deutsche Kompositionslehre des 18. Jahrhunderts*, ed. Peter Benary, Leipzig: Breitkopf & Härtel, 1961), or Kirnberger, *Die Kunst des reinen Satzes in der Musik* (Berlin, 1774), vol. I; for discussion, see Allan Keiler, ‘The Problem of the Retrieval of Musical Knowledge The Thoroughbass Tradition and Its Relationship to Rameau’, *Journal of Music Theory*, 57/2 (2013), 287–320 and Joel Lester, *Compositional Theory in the Eighteenth Century* (Cambridge, MA: Harvard University Press, 1992), 231f. *Umkehrung* is rare and appears usually to mean contrapuntal interchange. In this context, *Umkehrung* can be contrasted with *Verkehrung*, in which case one term will mean ‘going through all the contrapuntal interchanges in order’, emphasising the permutational process, and the other will mean simply ‘interchange’, referring to a given disposition of the counterpoint; but usage is not consistent among authors. In Marpurg’s *Abhandlung von der Fuge*, *Umkehrung* is the thorough-going process of inversion and *Verkehrungen* are the individual contrapuntal arrangements produced thereby; in Scheibe’s *Compendium*, the usage is the reverse.

<sup>36</sup> Marpurg’s characterisation of triple counterpoint in this way was the starting point for Harrison’s formalisations; see Harrison, ‘Some Group Properties of Triple Counterpoint’, 24.

Harrison modelled this property as transformational efficiency; but in musical terms this can be thought of as a balance between variety and concision in that each presentation of the counterpoint presents each voice in a new position relative to both of the others.<sup>37</sup> In the great majority of Bach's triple counterpoints, only the three arrangements from one of the two groups shown in Illustration 1 will be deployed in the course of the composition.

The A-flat major fugue from *The Well-Tempered Clavier I*, BWV 862/2, demonstrates this principle (Example 5). Bach deploys a triple counterpoint in such a way that each melody never appears in the same voice twice in succession, and furthermore each voice states each melody exactly once. Crucially, the hand that takes two voices alternates with each disposition—the left hand in bars 11–12, the right in bars 14–15, then again the left in bars 19–20. Just as in double counterpoint, triple counterpoint arises as the swapping material between the hands. The interchanged entities are not only voices in the abstract but the contents of the hands.

Example 5: Three arrangements of triple counterpoint in Fugue No. 17 in A-flat major (BWV 862/2), bb. 11–12, 14–15 and 19–20

Johann Philipp Kirnberger's treatment of triple counterpoint shows how contrapuntal inversion of the kind described above was conceived in relation to thoroughbass. In *Die Kunst der reinen Satzes in der Musik*, he writes:

<sup>37</sup> Ibid., 31.

When the piece is in three parts, such that all three parts are invertible, each voice must behave as a two-voice double counterpoint against the other [*sic*], such that the upper as well as the middle part could stand in the bass as the fundament.<sup>38</sup>

In the immediate context, what Kirnberger means by '*gegen die andere*' could seem ambiguous. With respect to *which* of the other *two* parts must each voice behave as a two-voice double counterpoint? In fact there is a slippage in his usage of *Stimme*. In the first clause, it is clear that *Stimme* refers to any one of the parts (*dreystimmig; alle drey Stimmen*). However, in the second half of the sentence, *jede Stimme* must refer to each of the *upper* parts (*zweystimmig; sowohl die obere als mittlere Stimme*), and not to the bass which is termed *Baß* and *Grundstimme*. (*Baß* refers to the position in the texture, while *Grundstimme* has the sense of 'basso continuo', referring to the musical function of this lowest voice.) This reading conforms to Kirnberger's general usage in this chapter, wherein repeated reference is made to two parts (*Stimmen*) in double counterpoint to which a third non-invertible bass part (*Grundstimme*) might be added.<sup>39</sup> A complication arises at this juncture because here Kirnberger makes the conceptual leap that a third part, initially an 'added' thoroughbass to the double counterpoint it harmonises, might itself be invertible with respect to the other two parts. (This is a frequent strategy in Bach's initial presentation of material in triple counterpoint, as for example in the opening bars of the D-major and F-minor sinfonias.) Kirnberger is sensitive not to conflate the total number of parts in the *Satz* with the number of invertible parts, but he is unsure how to distinguish these terminologically since *Stimme* can

<sup>38</sup> 'Wenn aber der Satz so dreystimmig seyn soll, daß alle drey Stimmen können umgekehrt werden, so muß jede Stimme gegen die andere [*sic*] sich verhalten, wie ein doppelter zweystimmiger Satz, damit sowohl die obere als mittlere Stimme im Baß als Grundstimme stehen könne.' Johann Philipp Kirnberger, *Die Kunst des reinen Satzes in der Musik: aus sicheren Grundsätzen hergeleitet und mit deutlichen Beyspielen erläutert* (Berlin and Königsberg: G. J. Decker and G. L. Hartung, 1777; repr. Hildesheim: Georg Olms, 1968), vol. II/2, 36.

<sup>39</sup> For example, the distinction between *Stimmen* [upper parts] and *Grundstimme* [bass] is clear enough when Kirnberger writes:

Wenn zu zweyen im doppelten Contrapunct gesetzten Stimmen eine Grundstimme hinzugefügt wird, so erhalten selbige Freiheiten, die ohne Grundstimme in vielen Sätzen unerlaubt sind, als...

When to two [upper] parts set in double counterpoint a third bass part is added, certain freedoms are taken which would be forbidden in many counterpoints without the [added] bass, such as....

However, the slippage in the meaning of *Stimme* cited in the main text occurs at several other points in Kirnberger's text. For example:

Wenn eine von beyden Stimmen, welche in doppelten Contrapunct gesetzt find, zur untern Grundstimme wird, so hat man mit der dritten Stimme, sie stehe in der Mitte oder oben, nichts weiter zu beobachten, als daß der dreystimmige Satz allen Regeln des einfachen Contrapuncts gemäß sey.

When one of the two [upper] parts, which is set in double counterpoint, becomes the bass, one has to attend to nothing other than that the third voice [i.e. the *other* upper part not being inverted with the bass], be it in the middle or above [i.e. the highest], conform to the rules of simple [uninvertible] counterpoint.

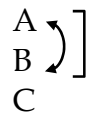
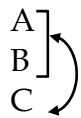
In this passage, *Stimme* first means the upper (invertible) parts, and only subsequently, once the *Grundstimme* is stated to participate in some inversion, does it encompass all three parts. Kirnberger, *Die Kunst des reinen Satzes in der Musik*, vol. II/2, 31.

refer to either. The ambiguity in the usage of *Stimme* stems from the reflex to map the concept of 'part' in thoroughbass with the analogous concept in invertible counterpoint.

Kirnberger thus distinguishes two inversions in triple counterpoint: (1) between the bass and the upper two parts, and (2) between the two upper parts over the bass held constant (Illustration 2).

Illustration 2: Kirnberger's *Verkehrungen*

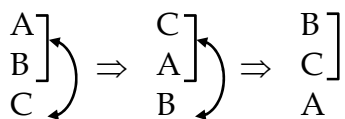
- (a) Inversion of the bass and the upper two parts      (b) Inversion of the upper parts over a bass



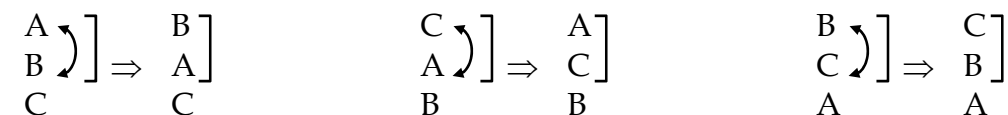
Implicitly, the bass is the left hand and the upper parts are taken in the right hand. Inversion between the bass and the upper two parts exchanges material between the hands and so is equivalent to inversion in double counterpoint; inversion between the upper two parts changes the order of the voices in the right hand and is therefore equivalent to thoroughbass 'inversion' (*Verkehrung*). In this way, Kirnberger shows that he conceives of the structure of voices in invertible counterpoint in precisely the same way as he does the physical distribution between the hands of voices in thoroughbass. Each part (implicitly a bass in the left hand) is interchanged with the other two (implicitly upper parts in the right hand) *taken together*. This generates only three of the six possible permutations (Illustration 3a); the second operation inverts, in each of these three permutations, the two parts of the right hand while holding the bass constant, producing three more permutations for the total of six (Illustration 3b).<sup>40</sup>

Illustration 3:

- (a) Three arrangements of Group I [compare Illustration 2(a)]



- (b) Three complementary arrangements of Group II [compare Illustration 2(b)]



Even in the context of a theoretical rather than practical treatment, Kirnberger's invocation of these basic thoroughbass techniques to derive the inversions of triple counterpoint shows how the conceptual apparatus for counterpoint and thoroughbass are mutually indebted.

<sup>40</sup> Kirnberger, *Die Kunst des reinen Satzes in der Musik*, vol. II, 36.

Distinguishing contrapuntal inversions along these lines is consistent with a fundamental principle of thoroughbass pedagogy and practice: normally the bass is taken alone in the left hand and the other parts are taken in the right hand.<sup>41</sup> Allan Keiler has argued that the fact that several parts were played by a single hand tended to unify them conceptually in opposition to the bass. He writes:

[It is commonly advised] for the left hand to play only the bass note and the right hand to play [the remaining notes of] the figure, or chord. The reasoning is not hard to understand. The bassline has become so important psychologically as well as musically as the foundational principle of harmony that it seems sensible to isolate it tactilely. Now having come only this far, it would not take teachers or writers of thoroughbass performance very long to notice that much of the time—but certainly not always—the right hand will be left with a simple triad of one kind or another. Or, put differently, many different figures will provide the right hand with [the same] simple triads [over various basses] if the left hand plays only the bass note ... It is surely easier to conceive of each [set of] figure[s] as an indivisible gestalt and to locate it as a single entity. And the easiest entity to locate in this way is a triad.<sup>42</sup>

Since figures denote intervals above a bass, they potentially imply as many contrapuntal parts as there are figures.<sup>43</sup> When a set of figures is construed as a conceptual and tactile gestalt, this necessarily implies that multiple contrapuntal parts within the right hand are so conceived and perceived: as a conceptual and tactile unit.<sup>44</sup>

This way of conceiving thoroughbass is exactly analogous to Kirnberger's conception of triple counterpoint discussed above. The third part is not counterpointed against each of the other parts independently, it is instead structured as a counterpoint to the harmonic template which the other parts—themselves a double counterpoint—together produce. This explains the commonality of a particular harmonic template in triple counterpoint: a 7–6 sequential framework. If two voices are sequenced as 7–6 in double counterpoint, another double counterpoint to one of those voices that sticks to basic consonances will behave as a triple counterpoint to both (Illustration 4).<sup>45</sup>

<sup>41</sup> For a historical overview, see Carl Dahlhaus, *Die Musiktheorie im 18. und 19. Jahrhundert. II: Deutschland*, ed. Ruth E. Müller (Darmstadt: Wissenschaftliche Buchgesellschaft, 1989), 115f.

<sup>42</sup> Allan Keiler, 'The Problem of the Retrieval of Musical Knowledge: The Thoroughbass Tradition and Its Relationship to Rameau', *Journal of Music Theory*, 57/2 (2013), 303.

<sup>43</sup> Implicit figures imply contrapuntal parts too: '6' obviously implies the sixth and the third above the bass, each of which is a potential contrapuntal voice.

<sup>44</sup> This tactile and conceptual unity is expressed succinctly in German by the term in *begreifbarer Stil*, which denotes keyboard-style harmony where the bass is in the left hand and the other voices appear as a chord in the right hand. See Dahlhaus, *Die Musiktheorie im 18. und 19. Jahrhundert*, 115f.

<sup>45</sup> Similarly common thoroughbass sequences cannot be reliably used in invertible counterpoint for various reasons: ascending 5–6 causes a dissonant fourth to arise in inversion; likewise sequences involving the ninth cause an unprepared seventh to arise in inversion. Descending 4–3, although it always inverts licitly as descending 5–6, cannot produce clear harmony in two voices because the interval 3 can represent  $\frac{5}{3}$  or  $\frac{6}{3}$ ; whereas the 6 in 7–6 unambiguously represents  $\frac{6}{3}$ .



## Illustration 4

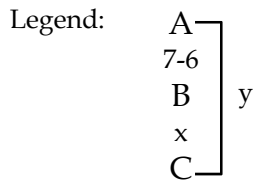


Table of inversions for three voices, ABC, in triple counterpoint where two, AB, are a 7-6 sequence

y	7-6	8-7	9-8	10-9	4-3	5-4	6-5	7-6
x	1	2	3	4	5	6	7	8
x inverted	8	7	6	5	4	3	2	1
y inverted	2-3	8-9	7-8	6-7	5-6	4-5	3-4	2-3

Now if this principle were understood abstractly, one would not expect that the first arrangement of the counterpoint would locate the voices in 7-6 relationship so frequently in one hand; however, triple counterpoint is routinely constructed as a double counterpoint between a 7-6 sequence in one hand and a free counterpoint in the other. In other words, the two voices in one hand behave as the realisation of a 7-6 chord pattern against a third voice—i.e. a two-handed contrapuntal structure. This is indeed the basis for Walther's summary treatment of triple counterpoint in the *Praecepta*, as his illustration reveals (see Example 6). The two voices played by one hand, a contrapuntal and tactile gestalt, are only subsequently interchanged as independent voices. This indicates the importance of the hand as a conceptual unit in keyboard playing and, accordingly, as a structuring unit in keyboard counterpoint.

The image shows three staves of musical notation. The top staff is in treble clef and contains a sequence of eighth and sixteenth notes. The middle staff is also in treble clef and contains a sequence of quarter and eighth notes. The bottom staff is in bass clef and contains a sequence of eighth and sixteenth notes. The notation illustrates the concept of triple counterpoint where two voices in one hand (top two staves) are treated as a single unit against a third voice (bottom staff).

Example 6: Walther's summary treatment of triple counterpoint in *Praecepta* (1708), 404

Kirnberger's inversions—between the hands and within the hand—correspond, respectively, to Marpurg's *Hauptversetzungen* and *Nebenversetzungen* in *Die Abhandlung von der Fuge* (Figure 1).<sup>46</sup> As in Kirnberger's treatment,

<sup>46</sup> These correspond to Harrison's 'conjugations' of triple counterpoint. Harrison's mention of Marpurg's twofold grouping of the six possible combinations of triple counterpoint makes no reference to its basis in thoroughbass and instead is offered to validate his group-theoretical approach. Harrison, 'Some Group Properties of Triple Counterpoint', 31.

Marpurg’s inversion between the hands produces the three arrangements of the first group successively, while inversion of the parts within the right hand produces the three arrangements of the second group. Marpurg’s diagram emphasises, moreover, that these contrapuntal arrangements arise in an order determined by the procedures of inversion themselves. It is important to note that the *Hauptversetzungen* and *Nebenversetzungen* are complementary and symmetric; in this sense how the two groups of three arrangements are labelled is incidental. Rather, the terminology *Haupt-* and *Neben-* denotes which group contains the first arrangement, with respect to which all the other arrangements are to be understood. This arrangement, in all of Kirnberger’s and Marpurg’s examples, is always taken to be first statement of the counterpoint as it appears in a given piece. In other words, it is determined by *dispositio* (formal arrangement) rather than *inventio* (intrinsic structure).

6 Das erste Hauptst. Vom dreydoppelten Contrap. I. Abschnitt.

I. Abschnitt.

Vom dreydoppelten Contrapunct in der Octave.

§. 1.

Eine Stimme wird hier gegen die andere nach den Regeln des doppelten Contrapuncts in der Octave ausgearbeitet. Es können also, auſſer allen conſonirenden Sätzen, auch die diſſonirenden darinnen ſtatt finden. Doch iſt in Anſehung der letzten dahin zu ſehen, daß kein diſſonirender Satz zum Vorſchein komme, der in der Verkehrung eine ungeſchickte Geſtalt erhalte, z. E. der Nonenaccord. Ferner kann keine Partie gegen die andere zwey Quartan hintereinander machen, weil die Quartan zu Quinten werden; und daß die Quinte nicht anders als eine Diſſonanz gehandhabet werden müſſe, weil in der Verkehrung die Quarte daraus entſteht, erfordert die Strenge der harmoniſchen Regeln. Doch es brauchts dieſer Erinnerungen nicht, wenn man weiß, daß eine Stimme gegen die andere durchaus nach dem Contrapunct in der Octave geſetzt werden müſſe.

§. 2.

Jeder nach der Strenge ausgearbeiteter Satz leidet ſechs Verſetzungen, worunter die drey erſten als Hauptverſetzungen, die übrigen drey als Nebenverſetzungen anzufehen ſind. Man kann ſich die drey Hauptverſetzungen in folgenden Zahlen, die, wie man ſiehet, auf die Stimmen, nicht aber auf die Sätzeweiſen, vorſtellen.

Erſte Hauptverſetzung  $\left\{ \begin{array}{l} 1. Diſſant. \\ 2. Mittelſtimme. \\ 3. Baß. \end{array} \right.$

Zweyte

Das erste Hauptst. Vom dreydoppelten Contrap. I. Abschnitt. 7

Zweyte Hauptverſetzung  $\left\{ \begin{array}{l} 3. Baß. \\ 1. Diſſant, \\ 2. Mittelſtimme. \end{array} \right.$

Dritte Hauptverſetzung  $\left\{ \begin{array}{l} 2. Mittelſtimme. \\ 3. Baß. \\ 1. Diſſant. \end{array} \right.$

Jede von dieſen Hauptverſetzungen hat eine Nebenverſetzung, die man erhält,

- (1) wenn bey bleibendem Baſſe die höchſte und mittelſte Stimme unter ſich verwechſelt werden, als:  $\left\{ \begin{array}{l} 2. Mittelſtimme. \\ 1. Diſſant. \\ 3. Baß. \end{array} \right.$
- (2) wenn bey bleibender Mittelſtimme die höchſte und die tieſte unter ſich verwechſelt werden, als:  $\left\{ \begin{array}{l} 1. Diſſant. \\ 3. Baß. \\ 2. Mittelſtimme. \end{array} \right.$
- (3) wenn bey bleibendem Diſſant die mittelſte und tieſte Stimme unter ſich verſetzt werden, als:  $\left\{ \begin{array}{l} 3. Baß. \\ 2. Mittelſtimme. \\ 1. Diſſant. \end{array} \right.$

Hier folgen einige Exempel.

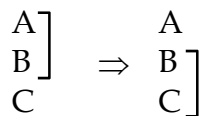
Erſtes Exempel.

Die Hauptcompoſition ſiehet Tab. I. Fig. 1. und Fig. 2. und 3. enthalten die Verkehrungen derſelben. Da nun jede Figur die Hauptcompoſition abgeben kann, und eine gegen die andere alsdann eine Hauptverſetzung ausmachet: ſo kann man allhier in einem Augenblicke die drey möglichen Hauptverſetzungen

Figure 1: Marpurg, *Haupt- und Nebenversetzungen* in *Die Abhandlung von der Fuge* (1753), vol. I, 6–7

Marpurg’s diagram shows that there is a third physical operation necessary besides the two Kirnberger implies: this is voice transfer between the hands, as Illustration 5 shows.

Illustration 5: Voice transfer between the hands



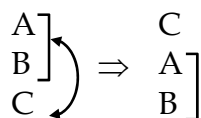
In three voices, if the top two parts, grouped in the right hand, are inverted with the bass in the left, we arrive at the second arrangement (Illustration 6a). To

derive the third arrangement from the second, it is not sufficient to interchange the contents of the hands again, for this would produce the first arrangement again. Rather, the middle voice must first be transferred from the left hand to the right hand without changing the order of the voices top to bottom (Illustration 6b); only then will interchange between the hands produce the third arrangement (Illustration 6c). This is the crux of the matter: from an analytic perspective which looks for ordering of parts in the abstract, it makes no difference to which hand the voice is allocated.<sup>47</sup> Yet by which hand a given voice is played is actually crucial to the way the successive arrangements come about.

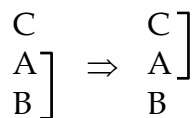
Marpurg's and Kirnberger's theories of *Verkehrung* as iterative, ordered operations point towards the *dispositio* in which the counterpoints produced thereby appear in practical music. If Marpurg's and Kirnberger's permutations were pure abstractions, not corresponding to keyboard thoroughbass techniques as suggested here, one would not expect the order of the exposition of their theoretical ideas to correspond to the *dispositio* of actual musical pieces; yet their analytic framework correlates strikingly to the way counterpoint is disposed in composition. These three operations – (1) contrapuntal *Verkehrung*, or interchanging the contents of the hands, (2) thoroughbass *Verkehrung*, or inverting the parts within the right hand, and (3) transferring an inner part between the hands without changing the relative order of the parts – can be observed quite readily in the notes; and indeed this way of parsing the strict counterpoint can relate it to other compositional domains, including texture, range or voicing, tonality, and free counterpoint.<sup>48</sup>

Illustration 6: Marpurg's *Hauptversetzungen* (Group I)

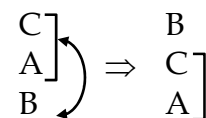
(a) Second arrangement from the first by inversion of the hands [= Illustration 3(a)]



(b) Voice transfer between the hands [= Illustration 5]



(c) Third arrangement from the second by inversion of the hands [= Illustration 3(a)]



## The general case: triple counterpoint

As we saw in the A-flat major fugue in Book I of *The Well-Tempered Clavier*, BWV 862/2, the three arrangements of one complete group (the *Hauptversetzungen*) are made in bars 11–12, 14–15, and 19–20 (see Example 5). I use the notation 'A(BC)' to denote an arrangement of three voices, where the letters denote the disposition of the voices in the first disposition (analogous to Marpurg's usage of *Diskant*,

<sup>47</sup> This led Harrison to conclude erroneously that there is an error in Marpurg's diagram (Figure 1). *Ibid.*, 49 n.17.

<sup>48</sup> David Yearsley analyses the canons of *The Art of Fugue* in similar way: the algorithmic precepts of canonic combination can help to explain both the disposition of the compositions and the way the music lay under the keyboardist's hands. See Yearsley, *Bach and the Meanings of Counterpoint*, 190–208.

*Mittelstimme*, and *Baß* to denote the same); the order of letters, left to right, denotes the position of voices, top to bottom, in a given inversion. The parentheses enclose the two voices that are taken in one hand; the unenclosed voice is taken in the opposite hand. Thus 'A(BC)' denotes in the right hand material 'A' as the soprano voice, and in the left hand material 'B' as the inner voice and material 'C' as the bass.

A consideration of these arrangements as the results of abstract contrapuntal permutations does not explain the variety of textures used; however a consideration of the way the counterpoint lies under the fingers can. This is because the arrangement C(AB) at bars 19–20 cannot be derived in a single operation from the preceding disposition (BC)A at bars 14–15. Rather, C(AB) is derived more directly from A(BC): first, octave transfer of the middle voice from the left hand to the right hand gives the intermediary disposition (AB)C; then, inversion of the hands gives C(AB). This analysis also accounts for the resting voice in each of the three instances of this counterpoint: by relating C(AB) from A(BC), we can account for the relatively high texture of C(AB) and the rests in the bass in bars 19–20.

The disposition of the parts under the fingers can also explain Bach's use of free counterpoint in cases where a strict statement was theoretically viable. In the A-major prelude of Book I, BWV 864/1, the first arrangement A(BC) begins in bar 1 and the second (BC)A begins in bar 4 (see Example 7a). In the second half of bar 8, the middle voice resolves downward by a leap of a major ninth—clearly a resolution by downward step displaced to the lower octave, bringing about the third arrangement of the first group (Example 7b). If we invert this third arrangement again, we would next expect to return to the first permutation as in bar 1, this time with two voices in the right hand as (AB)C not the left as A(BC). Indeed, bar 12 begins another instance of the theme, but as (AX)C with free counterpoint in the middle voice. In this bar we witness the free counterpoint ('X') passing from the right to the left hand. The moment where the transfer between the hands occurs, on the last semiquaver of the third beat, coincides with the moment free counterpoint turns to a strict restatement of the middle voice ('B'). The transfer of the middle voice from the right to the left hand was necessary to make the incomplete statement of a permutation at the beginning of the measure as (AX)C complete by the end of the measure as A(BC).

The D-major sinfonia, BWV 789, is Bach's only clavier work to use all six combinations exactly once in order. After all three arrangements of the first group have been stated in bars 1–12, the first arrangement of the second group is stated at bar 19 (AC)B, but with a curious variant in the upper two voices in the first half of the bar (Example 8a). When we consider that this permutation is derived from bar 6 (CA)B, we can appreciate the necessity for the variant. A strict version, given in Example 8b, would have produced a very awkward voice crossing in the right hand. The free version in the finished composition eliminates this: the notation hides a voice exchange precisely where the two voices have a passing unison, on the second semiquaver of the second beat.

## Example 7: Prelude No. 19 in A major, WTC I (BWV 864/1)

(a) bb. 1-6

(b) bb. 8-12

## Example 8: Sinfonia No. 3 in D major (BWV 789)

(a) b. 19

(b) hypothetical b. 19

The disposition of the other clavier sinfonia in triple counterpoint, Sinfonia No. 9 in F minor, BWV 795, likewise is related to the distribution of the parts in the hands. The first three settings of the counterpoint are those of the first group: (AB)C at bar 3, (BC)A at bar 7, and C(AB) at bar 11 which becomes (CA)B at bar 12. But in the second half of the piece, where we might have expected the remaining three arrangements of the second group, as was the case in BWV 789,

we get instead only one new arrangement, (BA)C at bar 18. This is the first arrangement of the second group, after which each statement of the triple counterpoint repeats some arrangement already heard but in a new tonal configuration. The missing arrangements (CB)A and (AC)B 'ought' to have occurred in bar 24 and bar 26 respectively; these would correspond to the parallel statements at bars 11 and 13. Example 9 produces the unused arrangements of the counterpoint in the tonal dispositions in which they would have occurred, had they been used; as is clear, these arrangements are contrapuntally viable. Why then might they have been omitted from the piece? First, themes A and B have opposing contours, so if theme A is the bass it must be two octaves below theme B if these voices are to avoid crossing. This leaves a gap in the register which, when these voices are this disposition, is always filled by theme C, as in Bach's bars 24–5. The wide spacing of hypothetical bars \*24–5 in Example 9 makes this disposition unsatisfactory in terms of part-writing and hand position, even though it is contrapuntally correct. Similarly, themes A and C have opposing contours, producing an eleventh in bar \*27 which is unsatisfactory when these voices are taken in one hand. Yet why must A and C be taken in one hand, instead of as A(CB)? Taking two parts in the left hand is indeed possible; Bach initially disposes the counterpoint in this way at bar 11 before the middle voice passes to the right hand. But in general this piece avoids two parts in the left hand, a trait which is by no means typical of the *sinfonias*, much less of Bach's three-part clavier writing. This disposition, as we have seen, is the normative distribution of parts in thoroughbass. Bach's maintenance of the more immanently coherent thoroughbass disposition may serve to elucidate the piece's extreme chromaticism in the mind of the player.

Example 9: Sinfonia No. 9 in F minor (BWV 795), hypothetical mm. 24–27

## Conclusion

I have endeavoured to show that three basic keyboard 'moves' – interchanging material between hands, inverting the voices within the right hand, and transferring an inner voice between the hands, all of which are of a kinaesthetic rather than abstract nature – (1) can account for the structural complexity and combinatorial properties of Bach's invertible counterpoint at the keyboard, (2) are conceptual categories that would have been accessible to eighteenth-century musicians, and (3) highlight the intellectual codependence of contrapuntal and thoroughbass theory and practice. The analytic sketches offered are but a few examples of many where a sensitivity to the distribution of the parts between the hands is relevant for understanding both local and wider compositional choices.

Keyboard counterpoint therefore is not fully abstract. Rather, it is worked out in the hands as much as it is thought through in the mind. By tracing the procedures of contrapuntal inversions through the dispositions of the hands on the keyboard, we approach something like the conceptual apparatus with which composers, students, and analysts understood the formal *dispositio* of counterpoint in the eighteenth century. In this way, counterpoint for keyboard becomes a window into the ergonomics of the hands on the keyboard, and so gives unusually proximate access to what could too easily be thought of as an ephemeral aspect of eighteenth-century music culture.