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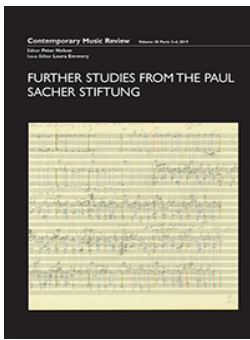
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Bauer, Amy

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Amy Bauer

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Amy Bauer

Nineteenth century musical virtuosity revived ideals concerning heroic agency via an artist-hero whose performance functioned rhetorically, to excite audiences attuned to progressive ideals. I argue that the virtuoso as 'ideological architect and symbol' [Palmer 1998. "Virtuosity as Rhetoric: Agency and Transformation in Paganini's Mastery of the Violin." Quarterly Journal of Speech 84: 341–357, 353] lives on in late modernism in a conflicted repertoire that both redoubles and rejects virtuosity, as in Ligeti's Études pour Piano (1985–2001). In 'Désordre' and 'Vertige' (the first and ninth études), this critique plays out aurally as a conflict between a surface virtuosic rhetoric and its subversion. But the evolution of reflexive codes that establish critical distance from those conventions can also be traced through letters and sketches housed at the Paul Sacher Stiftung. Like Edward Said's late modern hero, Ligeti's études and their reception history unite humanist sympathy towards tradition with critique of a contemporary culture balanced precariously on masterworks and performances of the past.

Keywords: Ligeti; Études; Désordre; Vertige; Virtuosity; Musical modernism

Nineteenth-century musical virtuosity moved beyond the superficial enjoyment of instrumental prowess to revive ideals concerning heroic agency via an artist-hero, whose music functioned rhetorically to excite audiences attuned to progressive ideals (Deaville 2003). Post-war music would appear to be part of this trend, moving further from trust not only in the representational value of tonality, but also in the traditional genres, values, and social codes that governed earlier practice. Yet since the 1960s and '70s, the virtuoso as 'ideological architect and symbol' has thrived in contemporary music (Palmer 1998, 353) often embodied by a repertoire that redoubles virtuosity, splitting composer from the performer as they together conquer extreme physical and aesthetic trials. One has only to note the Berio

Sequenzas, written for a select group of performers from 1958 onward, or Stockhausen's works of the 1960s that allow improvisation (discussed in Griffiths 2011, 210–22). The contemporary virtuoso exists in a liminal state, between the glut of celebrity virtuosi performing canonic eighteenth and nineteenth century works and the requirements of a less commercial, contemporary experimental aesthetic. I argue that the latter repertoire succeeds only when—as in Ligeti's *Études pour Piano* (1985–2001)—it directly confronts contradictions inherited from that nineteenth century model: the naïve virtuoso with an inhuman command over work and machine. Drawing from letters and sketches housed at the Paul Sacher Stiftung, and recorded performances, I examine the conflict between a surface virtuosic rhetoric and its subversion in two of those études: 'Désordre' (1985, Book I, No. 1), and 'Vertige' (1990, Book II, No. 9).[1] Both are linked by an ironic take on virtuosity, abetted by collaboration with virtuoso performers who in a sense collaborate in 'corrupting' the inherited model in which the virtuoso dominates her instrument with a transparent ease.

Virtuosity, as Judith Hamera notes, as a category seems both empty and too full, replete with representational and explanatory potential (Hamera 2000, 144). Virtue was originally that sense of human excellence expounded in the Renaissance with regard to rhetoric, politics, and the arts. The notion of virtuosity blossomed from virtue during the Enlightenment, where it was applied to painting and music in both theory and practice. Nineteenth century musical virtuosity became tied to notions of the autonomous and transcendent artist-hero, whose performance and music functioned rhetorically, to sustain momentum in audiences already concerned with social causes and ideals. But the contemporary use of virtuosity implies a tension born of a more complex negotiation between musical performance and text, between the sensuous presentation of an idea and its abstract form on paper.[2]

The Modern Virtuoso

Jim Samson traces the stealthy rise of the modern virtuoso, beginning in an intimate relationship between text and performance in the eighteenth century that expands to a stark division by the early twentieth century. If the concept of virtuosity was tainted by its association with rhetorical excess and empty display in opera, we can already find eighteenth century writers who praise both the compositional skill and the seductive powers of performer-composers like Mozart (Samson 2007, 71). As Samson and David Palmer aver, the friction between work and performer is inherent in the modern sense of virtuosity, which 'presents, rather than represents' (Palmer 1998; Samson 2007, 84). Virtuosity, at base, represents a surplus; one that in a modernist context challenges the authority of the text, the composer and the deeply-held conviction that there is something beyond the performance itself, some meaning inherent in the work concept, as well as the equally precious idea that the work is accessible to any musician who desires to perform it. Samson sees this surplus manifested in at least three distinct ways (Samson 2007, 73–77). The first sense of surplus was supplied by the new context in which the modern

European virtuoso operated. The history of the piano and of composer-performers like Mozart led to a cosmopolitan ideal of the musician as ambassador, buoyed by the universal rise of the skilled professional, the democratisation of culture, and the availability of both public performance spaces and journalists and audiences to fill them. Hence lively critical battles between the notion of virtuosity versus that of the work fuelled interest in performance, even as they documented the performer's growing quest for autonomy and individual agency. The dialectic between performer and work expanded to include the performer and his critic, peers, and most importantly, his audience, the latter bound in a drama of submission and liberation that transcended any individual reading.

The second sense of surplus lies in the public image of the virtuoso as automaton, whose fetishism of technique seems to promote the artificial over the natural. As in some incarnations, Paganini the demon and Liszt the sacred monster, the diabolical virtuoso disguised the dull labour of slow creation with the fantastic spectacle of painless execution. As such, the figure of the virtuoso marks our anxieties surrounding musical performance and creation, combining envy and desire with a fear that perhaps the surface is all that exists. In the nineteenth century this split between work and performer became entwined with the rise of liberal Romantic ideals that invested individual subjectivity with a new, elevated status. Thus, to vocal and composer-performer virtuosities that populated the Classical era, Samson adds a special nineteenth century category: a dignified Romantic virtuosity that trumped prosaic notions of a simple fealty to the work or to a historical ideal (the Neo-Baroque), reflecting a striving for freedom and worldly transcendence.

If virtue and virtuosity were coupled in many early modern arts, the overarching Romantic trope was the rise of the virtuoso as artist-hero (Palmer 1998, 341). The Romantic virtuoso turned the concert into an 'arena of risk and danger, an uncharted, unpredictable territory', in a pact with the audience that rewarded his (it was usually a him) valour with fame, and which endowed the visible results of his effort with an air of mystery and seduction (Samson 2007, 76). Hence the dynamic of virtuosity relied on an audience complicit in the fantasy, and inclined to sacrifice an appreciation of the abstract qualities of the text for the sensual thrills of its material reproduction. Paul Metzner writes of how this notion of the virtuoso spread during the Age of Revolution beyond music to embrace a variety of public spectacles, from chess and cooking to automaton-building (1998). Dana Gooley and Maiko Kawabata among others have identified 'heroic codes' attached specifically to Liszt and Paganini, and the repertoire with which those virtuosi were identified (Gooley 2004; Kawabata 2004).[3] As this was the Napoleonic era, those codes are often associated with military heroism and virility, alongside intimations of the diabolical, vocality, and the exotic. Such codes are concretised in Margaret Rose's twelve characteristics of nineteenth century virtuosic pianism, which she links directly to significant innovations in modernist piano literature. Her analysis includes the often-overlooked function of the piano as a 'one-man band' in Victorian homes and salons, and the pronounced theatricality of such an approach (Rose 1987, 46–7).

Ligeti's *Études pour Piano* arrived in the centre of a modern keyboard culture still in 'the thralls of Liszt's pianism', in the words of J. Mackenzie Pierce (2014, 151). Received from the start not as experimental curiosities, the études were heralded as canonic fixtures of the repertoire almost immediately, when Book I was awarded the Grawemeyer Award in 1986. Once thought too difficult for more than a select few virtuosi (especially Book 2), by the mid-2000s every major piano competition required one. One after another, reviewers describe the first two books as 'perhaps the most difficult' (Svard 2000, 804) works for solo piano, music 'at the edge of the human possibility for performing it', (Denk 2012), and the 'summa of contemporary keyboard literature' (Carl 2003, 147).

Ian Pace has identified six themes that have attracted scores of analysts and commentators to write on these works, although he suspects the trope 'Ligeti as heir to a golden age of romantic pianism' has made the works attractive to pianists little versed in new music literature (Pace 2012, 178). Hence critics like Alex Ross (2001, 134) and performers like Jenny Lin cite the historical lineage of the Études; 'For me, Ligeti is the obvious continuation of the solo piano tradition', she told us recently. 'It goes from Mozart, Beethoven, Schumann, Liszt, Debussy, Ravel, Bartók, Stravinsky, then right to Ligeti' (Lin in Rideout 2006, 26). Although each étude presents its own compositional and performance challenge, 'Désordre', the first étude from Book one, and 'Vertige' from Book 2 are especially famed for their complex structure and performance challenges, but no less, one suspects, for their dramatic potential in performance.

In their conception, performance practice and rapturous reception history, Ligeti's *Études pour Piano* reflect Samson's notions of a 'surplus' beyond the composition itself. As a first step, any pianist wishing to perform the études is enjoined to analyse them, and learn them as complex, abstract structures before engaging them physically (Can 2011). The process of interpretation demands extraordinary feats of speed, accuracy and control, and gains the performer a reputation as an artist who suffers for her art. Yet, Ligeti's études both celebrate and undermine the unique status of the historical virtuoso, who occupied an ambiguous role between the constative (as written) and performative text. The virtuoso does not so much perform a work as transform it, into something more vivid, immediate, and personal than that afforded by mere performance. Traces of this excess emerge from nearly every scrap associated with the folders of the Ligeti Collection at the Paul Sacher Stiftung devoted to the composition of the *Études pour Piano*. They reveal both deep connections to the tradition of Romantic virtuosity and suggest ways in which Ligeti has attempted to question, challenge, and at times undermine those conventions.

From Pulsation to Sensation: 'Désordre'

'Désordre''s drama must be wrested from its complex score, through a heroic effort that marries physical technique to a conceptual understanding of its polyrhythmic layers and written-in tempo changes—what the composer called 'tempo fugue'. The

composer's canny suggestion that the étude functioned as a 'concealed homage to the new science of deterministic chaos' (Ligeti 2007, 294) stoked the fascination of the scholarly community, and may explain why there are more published analyses of the first étude than any other post-war piano work. Although several studies consider intertextual and historic aspects of the étude,[4] the central conceit of recursive structure, alongside the polyrhythmic and polymetric complexity drives the majority of analytic studies. Hartmuth Kinzler's early analysis of 'Désordre' was framed as subtle parody for modernist insiders: those well-schooled in the fraught history between Pierre Boulez and Ligeti, enshrined in the latter's public analysis of Boulez's *Structures Ia* (Kinzler 1991).[5] Kinzler's exceedingly dry analysis was only partly tongue-in-cheek, as he sought to reveal not only how the 'new science of deterministic chaos' influenced its composition, but also how 'Désordre' served as a 'textbook example' of Ligeti's contemporary compositional process (Kinzler 1991, 89).[6] Subsequent analyses of 'Désordre' continue to follow Kinzler's lead by emphasising the so-called 'fractal structure' of the étude; this particular model can be seen to culminate in Heinrich Taube's *Notes from the Metalevel*, which models the work such that a facsimile of 'Désordre' could theoretically be generated from the algorithm that results (2005, 276–92).[7]

I count myself one of those acolytes when I proposed my own chaotic reading of 'Désordre': an L-system inspired model which generated the entire étude recursively from a small kernel, repeated and transformed with slight alterations according to a precise grammar (Bauer 2000). The gist of my analysis is summed up by the chart of global rhythmic structure (restricted to that of the right hand for clarity), reproduced in Figure 1. In this analysis the étude consists of three large sections; the third section is a slightly more symmetrical variation on the first: A-B-A1. Each large A Section is divided in half (labelled A and A1), while the B section is divided into three subsections (B, B1 and B2). Yet each of the seven resulting subsections separates clearly into two 'periods': an A period composed of three phrases, and a B period composed of four. Each of these phrases or 'motive groups' in turn is formed of four successive motives (indicated by small italic caps with super- and subscripts). The four motives comprise three durational categories, each composed of one ('c' units are single durations) or two elements ('a' units are short-long and 'b' units are long-short).

Each motive category undergoes a series of durational transformations, as indicated by symbols in the index provided at the bottom left of Figure 1 (I have accommodated the even group of two eighth-notes under 'a'). The motive groups in turn are imperfectly reflected by formal A and B divisions on each level of structure. Although A periods have only three phrases while B periods have four, B periods are only slightly longer. This minute imbalance between the duration of adjacent sections is repeated on the larger level: the two halves of each A section reverse those of the periods: the first subsection of each A section is slightly longer than the second. Its three subsections divide B unevenly into three, with the first two slightly longer than the final unit. The slight discrepancies that appear at every level of rhythmic structure mirror those found in the pitch structure of the work as well. Although the chart in
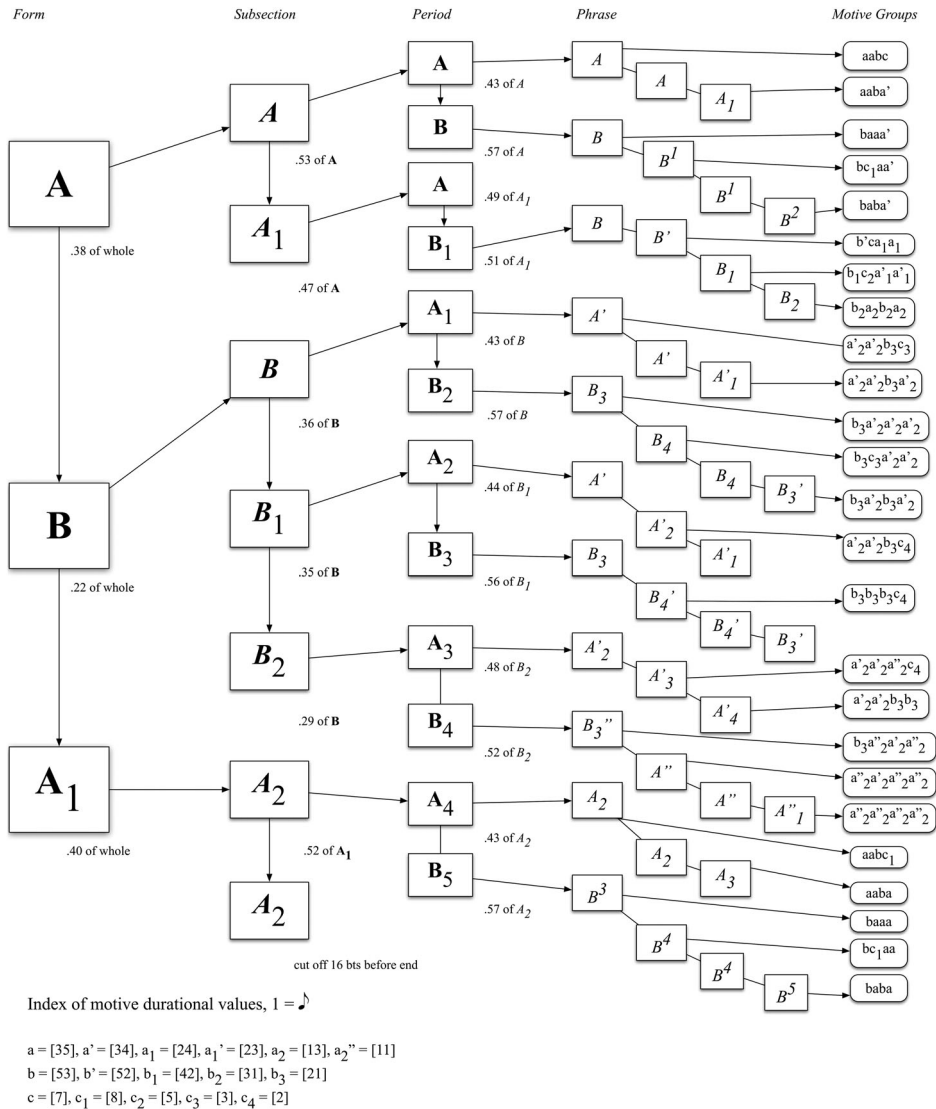
Index of motive durational values, 1 = ♪

a = [35], a' = [34], a_1 = [24], a_1' = [23], a_2 = [13], a_2" = [11]

b = [53], b' = [52], b_1 = [42], b_2 = [31], b_3 = [21]

c = [7], c_1 = [8], c_2 = [5], c_3 = [3], c_4 = [2]

Figure 1 György Ligeti: Synoptic analysis of global rhythmic structure in the right-hand part of 'Désordre'.

Figure 1 is restricted to the right-hand part, a similar but slightly altered structure operates in the left hand, to create variable phase effects and metric disjunction.

My original analysis was intended to show the level of compositional virtuosity represented by the étude's recursive structure, as well as suggest the difficulties it raised for the pianist attempting to convey separate layers of the étude in performance. But that discussion did not grapple with the inherent tension produced between the visual representation of recursive, bottom-up construction nestled within a top-down formal

design. What do the conflicts between different scales of the work indicate about its conception? They suggest, at the least, one of Samson's notions of surplus: a 'secret' structure that may not be perceptible to audiences, but which generates emergent compositional effects. Does such an analysis of this structure offer any guidance to the performer, who is primarily dealing with the physical and stylistic challenges manifested by such emergent effects?

Such tensions between the micro- and macro- levels of the work can be traced in both dated and undated sketches in the György Ligeti Collection at Paul Sacher Stiftung. Sometime in 1984 we find an elaboration of two prospective versions of 'Désordre': one is chromatic, inspired by Stockhausen's tenth *Klavierstück*, while the second includes the familiar rhythmic divisions, and the descriptors 'gamelan', 'minimal', and again 'Nancarrow', followed by a list of earlier works. Notable is a reference to Clarence Barlow's *Çoğluotobüsişletmesi*, a virtuosic 30'+ work written for and recorded by Herbert Henck, whose dense textures and rhythmic distortions are almost comical in import (Barlow and Henck 1982). Two manuscript sketches from the end of 1984, dated 11 November and 31 December respectively, retain the names: *5/7, Pulsation* and *Blanc et Noir*, using four staves to distinguish between the accented melody, its grouping, and octave 'gongs'. The 11 November sketch (not reproduced here) covers the page with various two and three-bar models, crossed out multiple times, with baffling performance directions in Hungarian and French. The 31 December sketch reproduced in Figure 2, lays out similar ideas much more clearly, employing a 12/8 metre in multiple divisions, indicated by coloured pencil. Here we see clearly three levels of rhythmic structure identified by varied divisions of the 12/8 bar across two treble and two bass staves. The top system has been completed by notation which further differentiates the treble and bass lines in the centre from one another, and reveals the motives that articulate a steady eighth-note pulse on the fastest level of structure.

The undated formal sketch shown in Figure 3 retreats to a wholly abstract view of the piece, enumerating the pulse groupings on graph paper under the title 'Pulsation'. Indeed, pulses are grouped recursively into even and odd segments in a mechanical schema that suggests an automatised performance practice.

These plentiful rhythmic sketches support 'bottom-up' recursive analyses of 'Désordre', but offer no guide to its more traditional aspects. Those include allusions to Baroque three-part counterpoint forms, as the treble, white-key diatonic melody and its imperfect imitation on the black keys expand and contract rhythmically within a three-part formal design. An abstract, three-part form of Ligeti's lament topic—constrained within a narrow melodic compass—constitutes the étude's primary theme. Thirteen transpositions of this theme outwards by diatonic step establish the form of the étude as a whole, such that subsequent transpositions shift mode, as in Debussy. Right and left hands move in contrary motion, tracing the outlines of the pitch wedge nested within a theme whose pitch expansion and contraction reflects its rhythmic transformations. The journey from momentary synchrony to increasing disorder seems to resolve itself with a modified return to the opening material. Yet the work ends abruptly, when the 'wedge' expands to encompass the entire keyboard:
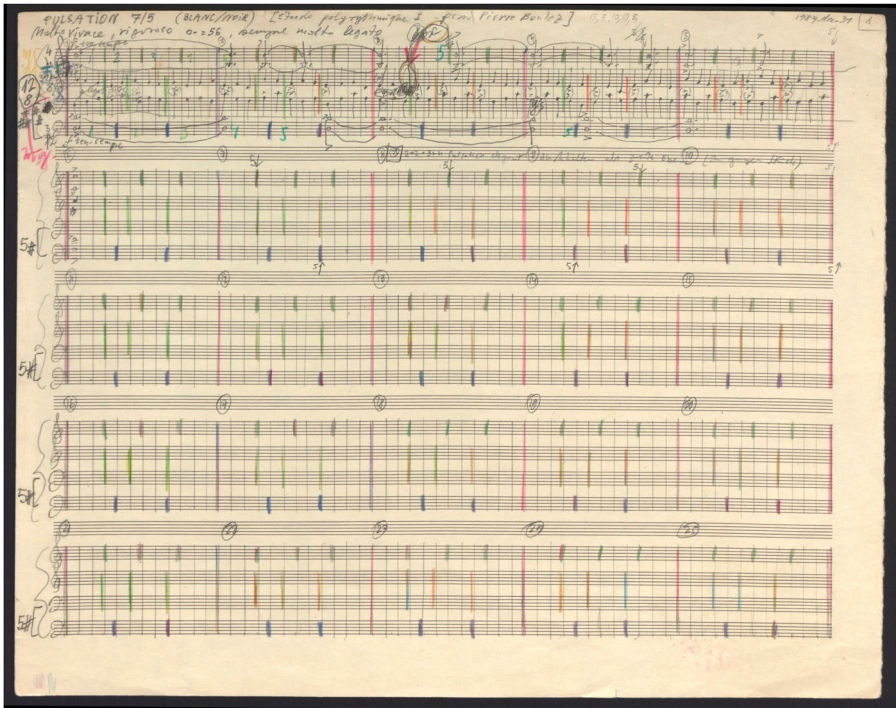
Figure 2 György Ligeti: Sketch of 'Désordre' dated December 31, 1984. György Ligeti Collection, Paul Sacher Stiftung. Used by permission.

the left hand stops at the lowest possible black note, A-sharp0, while the right halts at the upper limit of the piano's spectrum, on C8.

Ligeti's offhand comments undoubtedly encouraged the obvious preoccupation of scholars with credulous representations of the étude as a complex system or rhythmic puzzle. In this sense the literature on 'Désordre' stands as a model of the psychological fascination that motivates much analysis of modernist works, in which the secret to a work's power and stature in the canon lies not in its obvious emotional or performative aspects, but paradoxically is hidden beneath its perceptible surface. Recent analyses of 'Désordre' take a more expansive view of the work's rhythmic phase-shifting and cyclic aspects. Sara Bakker's dissertation explores the cyclic exhaustion of multiple successive talea pairs in a process of acceleration and deceleration (2013, 83–110). Yet most analyses find a middle road, noting its recursive aspects as well as its more expansive, cyclic properties (as in Morresi 2002, 35–48; and Shimabuco 2013). Such a dedicated focus on its algorithmic structure ignores not only the impact of its larger formal plan but the fact that, as Rose argues, Ligeti may well have worked backwards from the physical gestures of performance towards the rhythmic designs on the surface (1987, 221–22). Ligeti acknowledged the disparate traditions reflected by piano music, but noted that 'acoustical, optical and tactile elements are melted for the virtuoso; it's music

Figure 3 György Ligeti: Reproduction of schematic rhythmic grid for 'Désordre' of an undated sketch. György Ligeti Collection, Paul Sacher Stiftung.

that is rooted in a sensual relationship to the act of performing the music' (Ligeti in Beyers 2000, 13). In his études these tactile sensations became almost as important as the 'acoustical result' (Ligeti 1997, 9; Ligeti 2003, 167).

Verbal sketches and jottings (Jonathan Bernard's term for an entire category of sketches in the Ligeti Collection, 2011) for the work suggest its affective and chaotic —in the mundane sense—history. One of the first sketches of the work—as well as correspondence archived at the Paul Sacher Stiftung—lists 'Désordre' as one of three études originally planned as birthday offerings to Pierre Boulez, intended for performance by Herbert Henck. Early descriptions include names like *Blanc 7 Noir 5*, *Septimes*, or just *5/7*, along with scattered descriptors depicting an opposition of right and left hands by white and black key collections, the dyadic structure of the melody, the inclusion of white-key and black-key clusters (structural elements that date back to Ligeti's Hungarian works), and the scattered terms 'polyphony', 'Banda-Linda', and 'Nancarrow'.[8] Additional metaphors for the work, found throughout the jottings, emphasise an inherent conflict between the work's intricate design and the kind of 'mad' virtuosity required to realise that design: 'labirintus-jungle', 'sounding mural', 'wounded music', 'crazy heart attack music', and 'crazy panic étude'. These descriptions suggest additional senses of surplus, all of which propose a physical or affective

limit ('heart attack', 'panic'), or shift the composition into another space: beyond civility (to the 'jungle') or the auditory (as a 'mural').

The sketch reproduced in Figure 4 stands out among the others for 'Désordre' in its imaginative sweep, a vision that appears to unite a rigorously formal view of the étude with its intensely corporeal conception. Ligeti's emphasis on high, middle and low registers is traced as an expanding wedge and annotated in several colours. (Figure 5 translates the various jottings into English). The rhythmic divisions of the theme (found in many other sketches for the work) appear at the second division of the page, where they seem to be aligned with contour descriptions and specific layers. These divisions appear again in the third section of the page marked 'Banda-Linda heterophonia', with uneven divisions linked to 'low music' and even divisions with 'middle music'. The lower third of the page links the overall shape of the work with specific textures, dynamics and hands, while the lower left-hand corner of the page features Ligeti's changing thoughts on tempo. Here physical gestures at the keyboard are linked to everything found in previous sketches, from dynamic markings, asymmetrical pulse groupings and earlier titles to descriptions of the work's disorienting affect.

The sketch reproduced in Figures 4 and 5 forces us to acknowledge the role of corporeality in composition; the link between the sonic and the tactile (see Molitor 2019). We might look on the links between physical gesture, rhythmic division, and visual images as evidence of the embodied cognition that Jonathan De Souza explores, an approach to writing for the keyboard that links the technology of the body with that of the instrument and its history of performance (2017). Or one might look at the wider role the keyboard plays as a kind of default interface that translates the corporeal into the mathematical and vice versa: a means of uniting 'literary, numerical, and other informational systems via transcription, transduction, and computation' (Moseley 2016, 109).

The union of the mathematical and metaphorical in 'Désordre' seems to come at the expense of the performer, if not brought herself to a 'crazy panic' certainly reduced to a semblance of one. 'Désordre' is music overwhelmed by the visceral sense of conflict, a music that, in the words of Peter Edwards, performs overload: the creative expression of an overabundance of information intended as a critique of linear narratives (2016). The most pertinent narrative 'Désordre' dissolves is the identification of music composition with complete control, a narrative Emily Dolan finds embodied by the keyboard itself, given the modern work concept which requires 'obedient instruments, performers, and ultimately audience members and musicologists' (2012, 11). This critique depends on the complicity of the virtuosic pianist, who must clearly distinguish several levels of minutely-detailed structure while expressing something close to a musical nervous breakdown. The control exerted by the composition-keyboard can no longer be exerted when both hands slip off the top of the keyboard, followed by three eighth-note rests and a fermata.

Fractal Pathologies: 'Vertige'

The conflicts between complete control and its apparent loss continue in the ninth étude 'Vertige'. Its dedication to Mauricio Kagel gives some idea of its precarious,

Figure 4 György Ligeti: Undated sketch of 'Désordre'. György Ligeti Collection, Paul Sacher Stiftung. Used by permission.

yet playful nature: when Pierre-Laurent Aimard complained that the étude was not playable, 'Vertige' was premiered in a player piano version arranged by Jürgen Hocker. It became the first of several études prepared for mechanical reproduction

ETUDES POLYRYTHMiQUES

I.   POUR PiERRE BOULEZ (DEDiÉ Á?) [Á SON LX-e
         "Pulsation"   ANNiVERSAiRE]
     Pianiste Herbert Henck
     commande de la Südwestfunk, Baden-Baden
                           «Étude ~~5/7~~ 7/5»

2 – 4 – (5) 6 layer = written mode

HIGH }
middle } written in score
low   }

                                          7 (3)
                          MULTIPLE   5 (3) |
HIGH = CONTOUR = OCTAVES   5 | 7 |
center = Octaves   3|2 | 3|4 | T
low = internal humming, wobble |
                                          5 (4) |
                                                         |

                          ↗   7 (4)_____ |

Banda-Linda heterophonia

---

     5   7
    ⌒⌒ ⌒⌒ | = low music   + then two

| 3 | 2 | 3 | 4 | "free" melody,
                                      a little ?   in meter
                      6   6
                    ⌒⌒ ⌒⌒
middle music: 12   ↗

        8   ↘ 3 + 3 3 + 3 = ♪. unit

             4 + 4 + 4 = ♩ unit

BIG MUSIC? (Tālā? Deep Gamelán?)

---

                                     right push off
shape   _____| both
_____| right hand   hands up |
| middle   gradually up | 🔺   ⬇   ⬇
| oscillate   down oscillate |_____ left hand left hand right ᴰᴵˢᴬ⁻ ᴾᴾᴱᴬᴿ
                      | left hand completely down low full [?] too
                                          arms   low   left
                                                     quiet low
_____
𝅗𝅥. = 56 | quiet

56 beats — 1'| ~~ca. 5²~~
112 „   — 2' |
112 „   — 3' | ~~(300 „beats", 0=60) looking at the plan~~
112 „   — 4' ←~~ca.~~ 4'!

Figure 5 György Ligeti: Translation of sketch reproduced in Figure 4. György Ligeti Collection, Paul Sacher Stiftung.

as if in direct challenge to any contemporary pianist labelled a virtuoso (n.a. 1990; Ligeti and Stahnke 2000, 137–8 n.a. 1990).

Such a premiere reflects a homage to the Shepard's scale, a phenomenon associated with computer music and represented in less blatant form throughout Ligeti's oeuvre. A descending chromatic scale, replicated at the octave, cycles through the same twelve pitches, yet—through a process of shading the successive dynamics of octave-related tones—is perceived as a single line in eternal descent (Shepard 1964). As in the case of chaotic systems and 'Désordre', this connection has been explored further by musicologists and computer music researchers. It is not surprising that Michael Weber's spectrograph of Volker Banfield's performance reveals that its subtle dynamic shadings 'correspond almost entirely to the model of Shepard's scale' (1994, 276).[9]

'Vertige' represents an idealised fractal structure more closely than 'Désordre', perhaps because of its attempt to model a computer-generated acoustic illusion. As noted in the score, the first four bars 'serve as a model for the compositional structure of the whole piece' (Ligeti 1998, 18). Figure 6 is a synoptic analysis showing the harmonic and temporal intervals of the first six measures and eight voices of the printed score, indicating with dotted lines the continuation of descending lines as they cross staves from upper to lower.

The descending sixteen-note chromatic subject repeats four times as a canon at the unison. Yet its interval of imitation varies, correlating with the mathematical sequence $7n + 1$ (where $n =$ a non-zero integer: 8, 15, 22), but soon diverges from a periodic pattern.[10] A clearly-marked exposition repeats the subject fifteen times, relying—as did 'Désordre'—on a rhythmic grid predicated on an eighth-note pulse. The canonic structure of 'Vertige' is not confined to an obvious three-part form, but expands outward, unencumbered by any hints of periodic structure.

Figure 6 György Ligeti: A synoptic analysis of the first six measure of 'Vertige'.

Brief descents and whole-step stumbles retard the étude's outward expansion, along with cursory wisps of melody buoyed by *tre cordi* accents (in mm. 45–64; 84–90; 110–126). But these quickly ebb against the relentless chromaticism, which circles the pitch space from A7 to Ab1 before—as in 'Désordre'—it passes beyond the limits of the piano keyboard, the final journey almost inaudible as C8 peaks over a descent to A0 at a dynamic of eight *p*.

The circular, mechanical structure of 'Vertige' seems at odds with any tactile inspiration, even if its title is a visceral index of the work's affective content. The corporeal effect of continual motion becomes a visual analogue in the work's notation, the 'constant sliding and collapsing' that instantiates a musical portrait of anxiety (Ligeti 2007, 293). The rhetorical concision of the term *vertigo* points to the condition of both listener—who is disoriented in registral and pitch space—and performer—who struggles to maintain an inhuman evenness of tone and speed at low volume across shifting registers and hand positions. The ceaselessly-descending eighth-notes of 'Vertige' are intended to melt into one another, a registral illusion intended to efface the identity of the piano as a percussion instrument, and to disguise the partitioning of pitch space into a mere twelve notes per octave.

For pianist, Pierre-Laurent Aimard, who worked closely with the composer, the transformation of a simple chromatic kernel from corporal sensation to acousmatic signifier in 'Vertige' contains a 'pathological' dimension:

> In your physical memory, you feel the gesture of the chromatic scale, but because Ligeti uses it as an ostinato, quickly and continually repeating itself, this creates another physical feeling altogether. You feel a transformation of this memory. Acoustically, at the beginning, you hear the chromatic scale, like Escher's perpetual waterfall. Then, it drowns on itself until you can no longer hear the chromatic scale, though you continue to feel it in your fingers. Ligeti disconnects the acoustical effect from the gestural, creating a brilliant illusion of perception. In fact, he is organizing a schizophrenia (Aimard in Sykes, 1999, 34).

As another layer of irony, Ligeti's isorhythmic, descending lines outline buoyant E major harmonies over a dominant B pedal, to lend the work what Manfred Stahnke called 'a California pop sound' that individual performers might choose to highlight (2000, 138). Aimard's recorded performance of this étude on Sony Classical (1997) is indeed muted and unsettling; that the lines feel almost weightless is more threatening than the fury unleashed by the more explicitly dramatic études like Number 13, 'L'escalier du diable'.

This 'feedback loop' between the composer's imagination and the tactile appears in different forms in the sketches and drafts of 'Vertige' housed in the Paul Sacher Stiftung György Ligeti Collection.[11] Figure 7 is a digital facsimile of what may be an early chart for the ninth étude (the sketch is undated); the original is written with coloured pencils on white paper. There is no legend for the various signs and symbols that compose this striking chart, but some indication that Ligeti intended this as an inventory of chromatic pitches, in which adjacent slashes and circles

denoted the use of a tone from the inventory, along with a direction of motion and a possible context.

This chart is one of many pages of verbal jottings, and at least seven notated partial drafts in addition to a fair copy. The only dated one is Figure 8, written in Vienna in 1985, the same year 'Désordre' was completed. Here we see an unmetered, unpulsed sketch which resembles a species exercise, albeit one in which—beginning on A4—brief, falling two- and three-note chromatic descents in two-note intervals of imitation move outwards in a chromatic wedge. The undulating chromatic wedge recalls mid-60s micropolyphonic works such as *Lontano* and *Lux Aeterna*, although the diatonic clusters that result summon up memories of an even earlier work from the 1950s, *Éjszaka* for SATB *a cappella* chorus. What look like rehearsal numbers, but may function as barlines, occur every twelve notes. A metric note in the upper right hand suggests that a 12/16 metre will be used to emphasise a 3 against 4 division. The only pitches written with durational cues suggest notes not involved in the descent, but which instead emphasise a slower-moving melody that floats above the dense harmonies below. This slower melody operates in counterpoint with stemmed left hand notes that mark the end of chromatic descents. Yet the stemmed notes in the right hand are slurred forward to imply their support for one or more notes of the aforementioned descent.

What I assume to be subsequent notated drafts all replicate the longer chromatic descent seen in the final score, albeit from different pitch and registral heights, and at various intervallic and temporal distances. The first four measures of a draft that continues for another twenty measures—with only slight alterations—is notated in Figure 9. The draft includes a dedication to pianist Volker Banfield, and makes explicit an implied 12/16 metre. The articulation and suggested dynamic of *pppp* are, if possible, even more challenging than those in the final score, urging the pianist to play like a 'breeze' (*Hauch*). The chromatic descent begins from B-flat4 rather than B, but repeats at the upper octave rather than the tritone when it
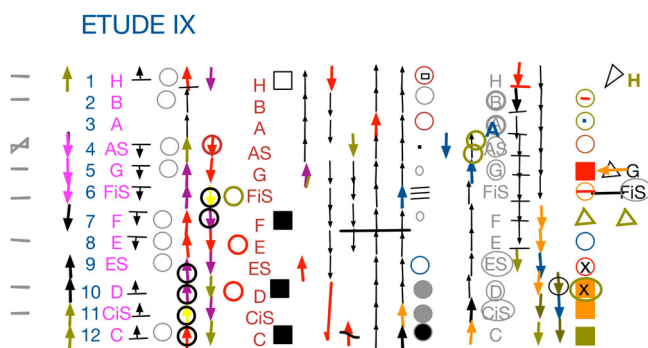

Figure 7 György Ligeti: Digital recreation of jotting for 'Vertige'. György Ligeti Collection, Paul Sacher Stiftung.

Figure 8 György Ligeti: Recreation of sketch for 'Vertige' dated August 1985. György Ligeti Collection, Paul Sacher Stiftung. (NB: Ligeti used lower-case 'I' in all the sketches).

reaches B-flat3 (m. 2), although—as in the final version— it returns to the same octave. Yet that left hand returns to F4 (rather than E-flat), and subsequent descents will return to B-flat4 for the next sixteen measures, long after the piece has abandoned its original level of imitation (the sketch continues to m. 65, with mm. 57–59 sketched twice).

The sketch recreated in Figure 9 suggests a lighter, less arresting composition than the final version. Figure 10, on the other hand, shows a more ponderous version: the first four compound measures of an aborted attempt in triplet octaves (the sketch continues for another stave before it is abandoned). Notable is the complete shift of register, common pulse, texture and dynamics: the descent takes place from B-flat1 and B-flat2 at triple *forte*, while Ligeti seems to experiment with a prolation-like shift in the common pulse, from eighth-note triplet to dotted eighth to eighth-note, doubled throughout in two or three octaves.

Figure 9 György Ligeti: Recreation of first four measures of an undated sketch for 'Vertige'. György Ligeti Collection, Paul Sacher Stiftung.

Figure 10 György Ligeti: Recreation of first four compound measures of an undated sketch for 'Vertige'. György Ligeti Collection, Paul Sacher Stiftung.

Subsequent sketches resemble the techniques seen in 'Désordre'. Ligeti expands the number of staves to four and lays out his metric grid with coloured pencils. His metric notations suggest a hemiola pattern embracing twelve pulses, in which two measures of six pulses each are divided by three measures of four pulses each. Several sketches begin the chromatic descent on A5, and reveal Ligeti's experiments with different intervals of imitation. For the most part these sketches display a denser, more chromatic texture, opposed to the airy, consonant light afforded by the asymmetrical, seven-interval long extended series of the finished exposition.

If the sketch shown in Figure 9 was too open and 'breezy', and that shown in Figure 10 too awkward, the sketch reproduced in Figure 11 strikes a compromise. Here the étude we know takes shape, even if it begins on B-flat4 rather than B4. The interval series that results from simultaneous descending lines—with minor seconds, fourths, tritones and fifths—remains irregular, represented by unmetered note-heads that remain in the middle two registers for almost twenty measures (as Ligeti notes in the left margin, these barlines merely serve as indications of grouping, and to offer orientation to the performer). The left hand marginal notes in German are a slightly less elegant formulation of the performance notes that precede the published score (Ligeti 1998, 18.), with a reminder that flatted-notes resolve downward. Ligeti's Hungarian notes in the right margin appear to discuss possible whole-tone, pentatonic and pélog melodies: A, B, D-flat, E, F, above C, D, F-sharp, G, D. (The Indonesian pélog scale features unequal divisions between seven successive tones, although most compositions rely on five-note subsets). Not reproduced for this article are verbal jottings which describe 'agonising' tempos and multiple metres; one note suggests groupings of the chromatic pulse by 2, 3, 4, 5, 7 and 11 without creating a sense of periodicity, while another mentions a melody 'like Chopin's prelude No. 19' (in E-flat major), but chromatic.[12]

As in 'Désordre', étude 9 provokes an uncanny performance from the gifted virtuoso, one that demands complete control even as it evokes an analogue version of a computer simulation. The sketches to the first étude mapped diverse signifiers of influence—in the form of composers, world musics, and images—to both a complex mathematic form and a gestural guide. By contrast, the sketches for

Figure 11 György Ligeti: Recreation of the first page of an undated, two-sided sketch for 'Vertige'. György Ligeti Collection, Paul Sacher Stiftung.

'Vertige' subject the central topoi of the chromatic descent to a series of variations that test the limits of the performer's ability to exert a self-effacing control over the demands of the keyboard.

The sociologist of play, Roger Caillois, divided all human games and play into four categories, one of which he termed *ilinx*, games based on the pursuit of vertigo, 'an attempt to momentarily destroy the stability of perception and inflict a kind of voluptuous panic upon an otherwise lucid mind' (2001, 24). Such 'voluptuous panic' defines the surplus that arises from the simple chromatic structure that constitutes 'Vertige'. We could view the series of sketches as attempts to induce vertigo via ever tighter or looser control over both counterpoint and the dynamics of the performance situation. According to Caillois, the powers of vertigo—once so important to social control and the sacred—are repressed in advanced societies, but leave their trace in our games and art (2001, 86–87; 156–157). Similarly, the performer of 'Vertige' forgoes the flashy, heroic codes that marked nineteenth century virtuosity while maintaining

superhuman control over sound, gesture and metaphoric image, that of 'individual waves that tumble over one another' (Ligeti 2007, 294).

The Reluctant Virtuoso

What do the sources tell us about the role 'Désordre' and 'Vertige' play in the new virtuosity? They leave no doubt that these multi-lingual, formal and visceral works challenge any attempt to force the études into a single narrative. 'Désordre' and 'Vertige' represent neither the straightforward evolution of nineteenth century pianism, nor another stage in the evolution of the modernist 'problem work', a mathematical puzzle for pianist and scholar to solve in turns. They display their own 'Ergodynamics', in Thor Magnusson's term, an own awareness of the piano's embodied, historical and aesthetic practices (2019, 43).

The neurotic energy of 'Désordre' and 'Vertige' combines knowledge and act in an ambiguous way, reflecting a late modernist practice founded on a critical distance from a compromised virtuosic tradition. Performer and composer emerge from these collaborations neither as conquering Romantic heroes, nor as cynical 'anti-heroes' dismantling tradition, but uniting, in Edward Said's summation, a humanist sympathy towards the past with a dogged resistance and self-reflective critique toward established attitudes (Said 2000). But Ligeti's critical études add something more in their stubborn attempt to synchronise unwieldy cycles in both hands, or yoke a mechanically-produced aural illusion to pop harmonies and punishing tempi. The performative encounter with virtuosity engages the audience in a dialectic that exposes both the labour of performance and that of listening, as the audience follows a narrative punctuated by moments of excess, vertigo and exhaustion (the climactic fall off the keyboard). 'Désordre' and 'Vertige' establish a new ironic, yet reverent practice. The performers who labour under their signs tacitly acknowledge the contemporary absurdity of their mission, as virtuosi who remain supremely confident, at the cost of an often painful self-awareness.

Disclosure Statement

Notes on Contributors

Amy Bauer is Associate Professor of Music Theory at the University of California, Irvine (PhD Yale 1997), where she teaches graduate and undergraduate courses on music theory and analysis, ethnomusicology, popular music and music aesthetics. She has published articles in *Music Analysis*, *The Journal of Music Theory*, *Contemporary Music Review*, *Indiana Theory Review*, and *Ars Lyrica*, and served on the boards of *Music Theory Online and Music Theory Spectrum*. She has published book chapters on the music of György Ligeti, Olivier Messiaen, Carlos Chávez, David Lang, modernist opera, spectral music, and the philosophy and reception of modernist music and music theory. Her monographs include *Ligeti's Laments: Nostalgia, Exoticism and the Absolute* (Ashgate, 2011), and the collections *György Ligeti's Cultural Identities* (Routledge, 2017) with Márton Kerékfy, and

The Oxford Handbook of Spectral and Post-Spectral Music (Oxford, forthcoming), with Liam Cagney and Will Mason.

Notes

[1] The author would like to extend thanks to the reviewers of this article, as well as the entire staff of The Paul Sacher Stiftung, and especially to Heidy Zimmermann, for their assistance during archival work undergone in Fall 2015. All of the examples and illustrations in this article were taken from The György Ligeti Collection of the PSS.

[2] Dana Gooley writes compellingly that the improvisational imaginary mediated the gulf between music and text in the work of nineteenth century composers and virtuosos (2018, 243–46).

[3] Ralph Locke writes about a shadow in Locke (forthcoming). A valuable survey of scholarly work on nineteenth century instrumental virtuosity appears in Cvejić (2016).

[4] In addition to Pace and Rose, these include Banfield (2006), Beffa (2012), Edwards (2001), Ferguson (1993), Hell (2013), and Tsong (2001).

[5] Ligeti's earlier essay was published as, 'Entscheidung und Automatik in der Structure 1a von Pierre Boulez', *Die Reihe*, 4 (1958): 33–64; in GS I, pp. 413–46.

[6] Kinzler's closing comments cite Hans Magnus Enzensberger: 'Whoever knocks on the hermeneutical gate, it will be opened for him' (Enzensberger 1988, 7; cited in Kinzler 1991, 124).

[7] See also Bader (2005), Lara-Velàzquez (2008), and Schütz (1996).

[8] Banda-Linda refers to the polyphonic music of the Banda-Linda from Central Africa, as recorded and analysed by Ligeti's friend Simha Arom (see Ligeti in Arom, 1985, xvii). Ligeti was a great admirer of the player-piano music of the Mexican-American composer Conlon Nancarrow.

[9] See also Purwins (2005, 114), Schneider (2005), and Toop (1999, 205).

[10] As shown in Bauer (2011, 87–9).

[11] The sketches and drafts reproduced for 'Vertige' all come from folder 52 in the György Ligeti Collection of the PSS. I address each sketch and draft in the order they in which they are catalogued within folder 52, but this succession may not reflect the chronology of the work's composition, nor indicate their importance to the final draft.

[12] Chopin's Prelude No. 19 is indeed not only one of the more difficult, but has a similar tempo and performance direction: *Vivace legato e sempre leggiero*.

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