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Reality Sounding: Annesley Black's *not thinking about the elephants*
Le son de la réalité : *not thinking about the elephants* d'Annesley Black

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Résumé de l'article

Cet article présente une analyse de *not thinking about the elephants* (2018) pour quatuor de saxophones et traitement numérique en temps réel d'Annesley Black. Composée pour le quatuor de saxophones Quasar, cette oeuvre explore les concepts de suppression et d'émergence à travers des dimensions traditionnelles de la musique telles que la mélodie, le contrepoint et la forme, mais aussi à travers des dimensions musicales contemporaines telles que la psychoacoustique (sons différentiels), les éléments théâtraux et le traitement numérique en temps réel. La démarche de Black s'engage de façon critique dans le processus d'écriture en lui-même en formulant des relations dialectiques entre les stratégies matérielles et compositionnelles (à la fois intuitives et systématiques). Cette oeuvre encourage l'auditeur à prendre part à une expérience d'écoute multidimensionnelle où les extrêmes conceptuels deviennent un catalyseur pour la construction du récit et de la tension.

Reality Sounding: Annesley Black's *not thinking about the elephants*

Anthony Tan

Saito: "If you can steal an idea from someone's mind,
why can't you plant one there instead?"
Arthur: "Okay, here's me planting an idea in your head. I say to you,
don't think about elephants. What are you thinking about?"
Saito: "Elephants"
– *Inception* (Nolan, 2010).

"What is sounding in reality?"[1] This question, posed by composer Mathias Spahlinger, regards musical experience not only as an object of our perception, but also as a condition of our perception, shaped by biological and psychological factors as well as the internalized musical and cultural premises of the listener's society. Annesley Black, a former student of Spahlinger, tackles this question in her work *not thinking about the elephants* (2018), for saxophone quartet and live electronics, written for Montreal's Quasar Saxophone Quartet. Black confronts the listener with the traditional musical dimensions of melody, rhythm, counterpoint, and form, but also plays on the audience's expectations of the concert-going situation and introduces psychoacoustic phenomena such as combination tones: additional subjective tones that are perceived when two real tones are played simultaneously. On engaging in analysis of Black's work, one realizes that the experience of this music cannot be limited to a study of the score. For Black, *what is sounding* emerges as a multidimensional experience resulting from performer interaction, electronic mapping and sampling, acoustic phenomena, and spatial movement.[2]

1. Spahlinger, 2008, p. 580.

2. Black, 2019.

A multidimensional approach to musical experience is quite typical for Black. Many of her works involve not only the use of live electronics, but also multimedia and theatrical elements that create a philosophical and poetic exploration of conceptual ideas. For example, in *4238 de Bullion* (2007-2008), for piano, live electronics, and real-time video processing, she plays with performer physicality, human-computer interaction, and temporal synchronicity. *Shadow Music* (2016), for ensemble and three performers playing with light and shadow, works through concepts of control, spatial movement, gesture, and light. *tolerance stacks* (2016), for five musicians, live electronics, playback, and media installation, involves the performers switching between acoustic and electronic instruments and between improvised and notated music, evoking Black's personal relationship with electroacoustic music history and the tensions between humans and machines.

Two themes are pervasive in *not thinking about the elephants*. First, ideas of suppression and emergence permeate many aspects of the composition.[3] The original creative impetus behind the work and title comes from "Ironic process theory," the psychological effect where the deliberate suppression of a thought leads to its increased emergence.[4] Second, Black uses the polarity of conceptual extremes to create dialectic relationships. For example, she uses a systematic compositional process to manipulate musical material, but remains open to experimentation and playfulness. She gives her attention to the psychophysical aspects of listening (difference tones, spatial segregation) even as she makes use of a rigorous structural process that may be inaudible (but is nonetheless available to be sensed subconsciously). Black's approach in *not thinking about the elephants* creates a network of relationships, and forges diverse connections and situations such that musical objects can be perceived uniquely by different listeners. This analysis will focus on how themes of suppression, emergence, and polarity are expressed in the dimensions of pitch, counterpoint, temporality, form, and live electronics.[5]

Trichords and Difference Tones

Black navigates a polarity between set theory procedures and the use of psychoacoustic phenomena as both a perceptual result of frequency interactions between instruments and a model for the construction of harmonic material. In conversation with the composer,[6] it was revealed that the pitch material originates from a seven-note synthetic scale (Figure 1). With D as the central pivot note, pitches are added outwards (skipping C natural) until a perfect fifth is reached (B flat to F).

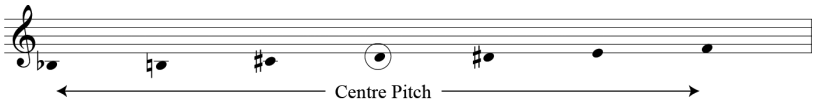
3. *Ibid.*

4. Also known as *ironic rebound*, or *the white bear problem*. This concept was first studied clinically by social psychologist Daniel Wegner (Wegner, 1987).

5. For a video performance of the work by the Quasar Saxophone Quartet, see Quasar, 2018, https://youtu.be/xoPnfhpI6UQ (accessed August 29, 2019).

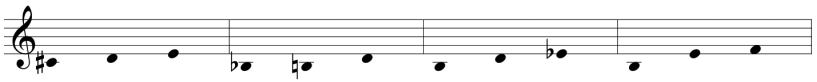
6. Black, 2019.

FIGURE 1 Seven-note synthetic scale.



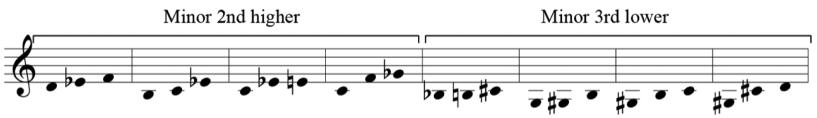
From this scale, Black extracts trichords to create three-note motivic cells. Four primary melodic units emerge. Each of these trichords contains a chromatic step and a larger interval leap ranging from a major second to a perfect fourth.

FIGURE 2 Three-note motivic cells.



Subsequently, the melodic units are transposed a semitone higher and a minor third lower, expanding the melodic material.

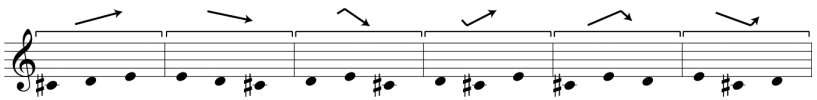
FIGURE 3 Transpositions of motivic cells.



The primary motivic units are then run through permutations according to trajectory profiles, creating microvariations.[7] The six trajectory profiles are: all ascending, all descending, step up then leap down, step down then leap up, leap up then step down, leap down then step up.

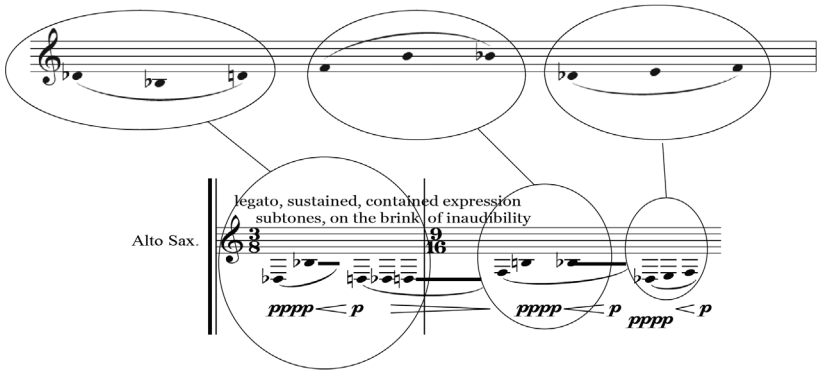
7. *Ibid.*

FIGURE 4 Re-ordering of a single cell according to trajectory profiles.



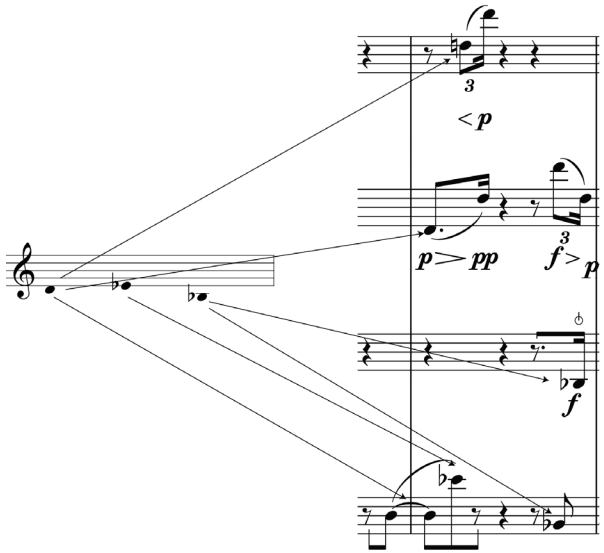
Black also allows for free modulation and variation of this material. Pitch material can be microtonally modified, notes can be repeated or omitted, and they can take on any sort of articulation, from harmonics to slap sounds. Furthermore, these motives are often strung together to create melodic streams (Figure 5), or the composer may use octave displacement to break up cells that are then reconnected to make phrases.

FIGURE 5 Melodic stream derived from trichords (mm. 78–79). © Edition Juliane Klein.



Additionally, melodic units are sometimes divided among the four voices of the quartet in order to dissipate the melody, introducing a pointillistic texture.

FIGURE 6 Pointillistic texture derived from a trichord (m. 198). © Edition Juliane Klein.



Vertical Dimension

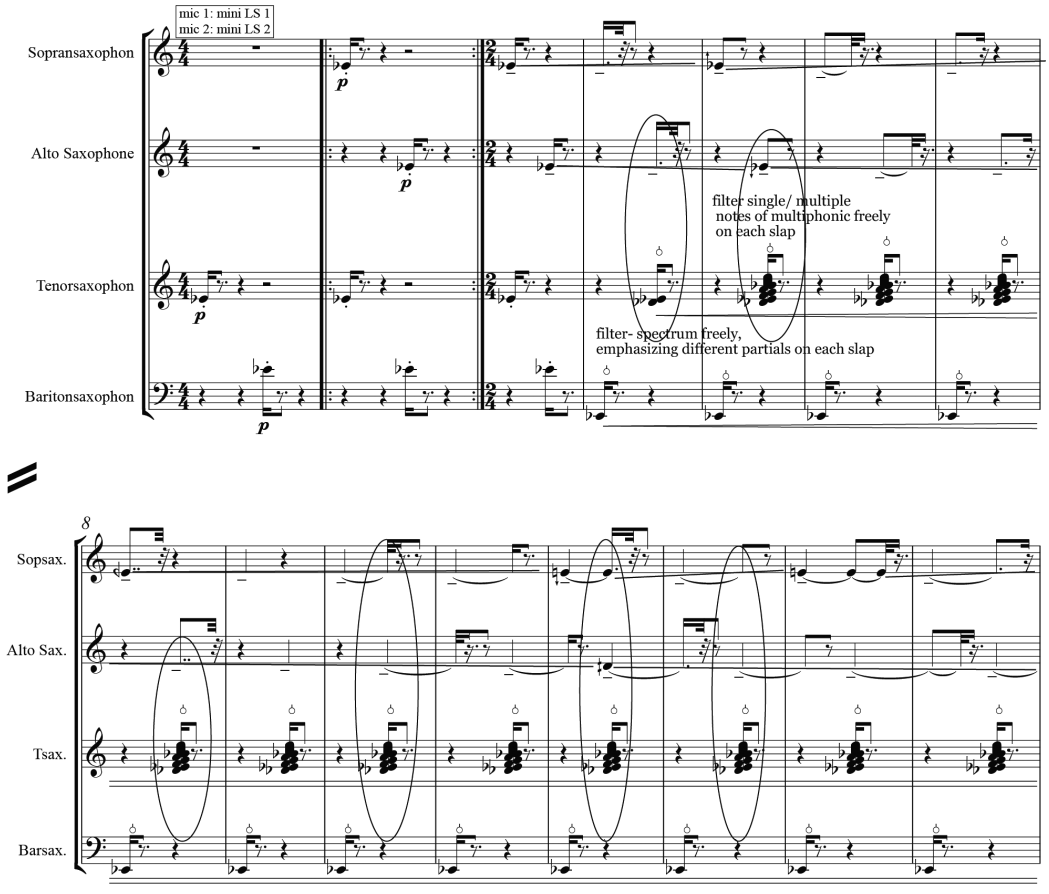
The composer uses *combination tones*, specifically *difference tones*, both as a psychoacoustic phenomenon resulting from pitch interactions, and as an impetus for vertical and harmonic construction.[8] Difference tones correspond to the theme of emergence as they result from the frequency differ-

8. Black, 2019.

ences between two pitches, creating an emergent frequency heard within our minds rather than acoustically. In creating difference tones, E flat$_4$ acts as a drone against which the trichord material is played, resulting in perceived combination tones.[9] The difference tones are used in two ways. First, they arise perceptually from the interaction between pitches played by the tenor and baritone saxophones and the pitches from the soprano and alto saxophones projected into mini-loudspeakers inside the larger instruments' bells. An example of difference tones can be found at the beginning of the work (Figure 7). The piece begins in pulsation with repeated unison E-flats. The tenor begins a slap tongue technique while freely performing multi-phonics

9. *Ibid.*

FIGURE 7 Opening of *not thinking about the elephants* (mm. 1–15). Example areas where difference tones may be created. Score in C. © Edition Juliane Klein.

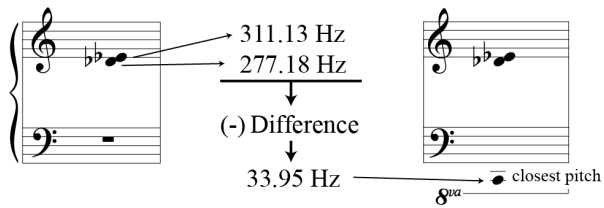


on E flat, and the baritone moves to a low E flat that is also performed with a slap tongue, providing the fundamental of a spectral structure. The higher members of the quartet continue the impulses on the E flat, but shift microtonally in opposite directions so that the soprano sax moves upward to an F, and the alto sax moves downward to a D flat. Since the soprano and alto sounds project from the bells of the other two saxophones, their sonic proximity creates *difference tones*. The microtonal pitch shifting of the soprano and alto creates a range of difference tones.

Secondly, difference tones are used as a model for generating new harmonic material (Figure 8). Black calculates the difference tones that arise from playing each pitch of the trichord material against an E flat$_4$ drone.[10] For example, a D flat$_4$ played against an E flat$_4$ corresponds to a frequency (33.95Hz) slightly higher than C$_1$ quarter-sharp. The resulting tone is approximated to C$_1$, the nearest semitone that does not duplicate one of the pitch-classes already present in the chord.

10. *Ibid.*

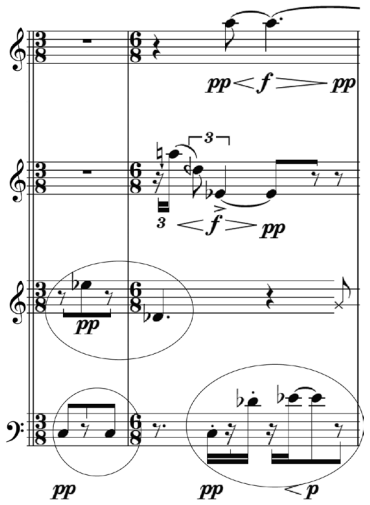
FIGURE 8 Harmonic construction from difference tone calculation.



Black then transposes the difference tone, mapping it for another instrument in the quartet to play as part of a polyphonic texture. Figure 9 shows how she uses the pitches E flat and D flat and the resulting C difference tone freely (sometimes with octave transposition) within the tenor and baritone saxophone parts. The difference tones exist between the artificial and the real, and are used compositionally both as a perceptual result and as a metaphor for harmonic production.[11]

11. *Ibid.*

FIGURE 9 Use of difference tone as melodic/harmonic material (mm. 167–168). © Edition Juliane Klein.



Dimensional Counterpoint

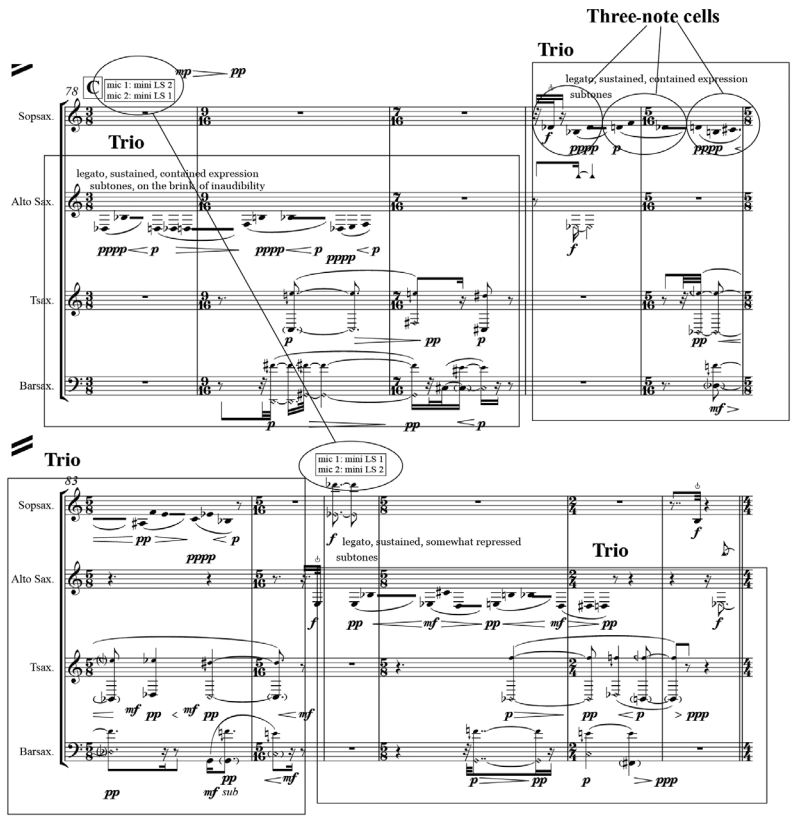
In this work counterpoint can be defined both in a traditional sense, as the weaving of pitch-oriented melodic structures to control dissonance and consonance within a harmonic dimension, and also in a broader sense, including the dimensions of space, temporality, and live electronics. Black constructs a complex contrapuntal texture for these additional dimensional "voices" to create a polyphonic network involving spatial movement, timbre qualities, and live electronic mapping. This polyphony becomes complex as melodic lines, instrumental tessituras, the mapping of the soprano and alto sound to mini-loudspeakers, and the spatial positioning of the performers change in relationship with each other. This dimensional counterpoint leads us to ask again, "What is sounding in reality?" and to question how the interactions create a polyphonic listening situation.

An example of dimensional counterpoint can be found in Section C (mm. 78–112) of the work. In the annotated excerpt shown in Figure 10, we see a series of three- to four-measure phrases grouped as trios. Each line consists of melodic units constructed from three-note cells presented in motivic patterns to create linear streams. From a pitch perspective, each trio forms a traditional polyphonic texture. Upon closer examination, however, a deeper dimensional counterpoint occurs. First, we see that the tessitura roles of the instruments have been reversed. The high voices of the quartet (soprano and alto) perform sub-tones in their low register, while the tenor and bass perform

high harmonics. Secondly, if we recall that the soprano and alto are offstage and only heard through speakers placed inside the tenor and baritone, we realize that the sound of the soprano and alto is filtered through the sounds of the tenor and baritone. Normally, the sound of the soprano saxophone is projected into the bell of the tenor, and the sound of the alto is projected into the bell of the baritone. During this section, however, the mapping is reversed. In m. 78, Black indicates that microphone 1 (placed on the soprano saxophone) should send its signal to speaker 2 (placed in the baritone saxophone). Similarly, microphone 2 (placed on the alto saxophone) sends its signal to speaker 1 (placed in the tenor saxophone). This situation is reversed at m. 85, and suggests a type of "invertible counterpoint," where microphone mapping, frequency space, and background and foreground textures are crossed. Returning to Spahlinger, "in new music, unlike 'accustomed' forms, foreground and background are interchangeable, main ideas can transform into peripheral ideas."[12]

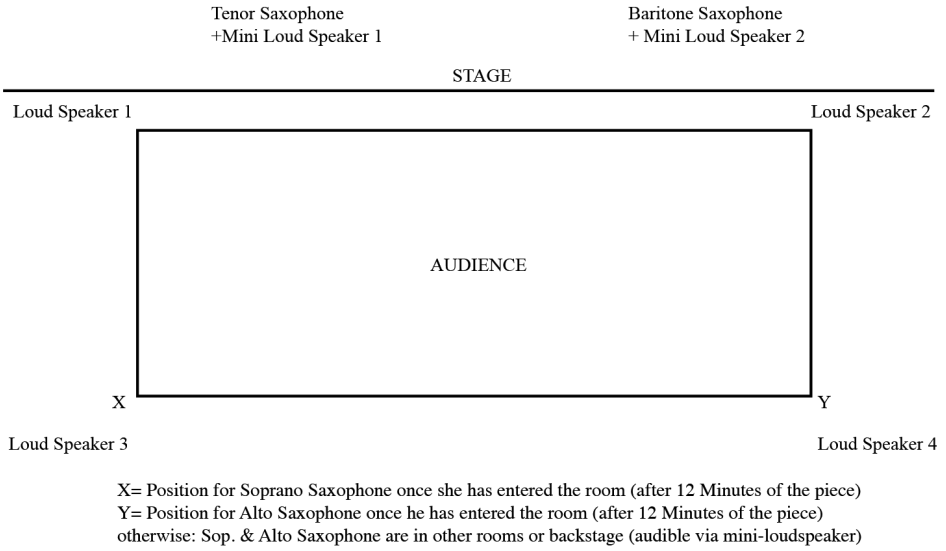
12. Spahlinger, 2008, p. 586.

FIGURE 10 Trios and inversion of instrument mapping (mm. 78–88). © Edition Juliane Klein.



The final dimension of counterpoint in this work is space, which is shaped by the stage set-up (Figure 11). With two instruments onstage and two hidden, plus a four-channel surround sound system, Black constructs situations of spatial counterpoint that separate what the audience can see from what they hear. This allows her to play with listener expectations around the relationships between space, source, and sound. She composes a deliberate trajectory, starting with sounds from the two instruments onstage and evolving through amplified and acoustic sound from onstage and off to end by surrounding the public with the acoustic sound of all four saxophones. A major shift in spatial arrangement occurs at around eleven minutes into the work, when the hall doors open to let in the distant acoustic sounds of the offstage soprano and alto. The listeners hear the musical material from the space outside the concert hall. About a minute later, near the end of the piece, the soprano and alto move into the concert hall, taking up positions near the outer speakers (positions X and Y), creating a new acoustic situation. The projection of their sound into the speakers is now muted. Through these spatial transformations, Black constructs a contrapuntal situation between musical material and physical location, moving from outside to inside, and from decoupled sources/sounds to a direct linking of cause and effect.

FIGURE 11 Stage set-up.



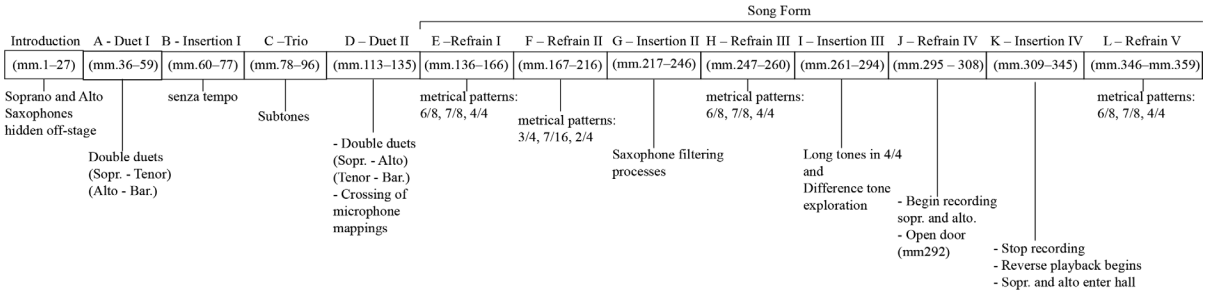
X= Position for Soprano Saxophone once she has entered the room (after 12 Minutes of the piece)
Y= Position for Alto Saxophone once he has entered the room (after 12 Minutes of the piece)
otherwise: Sop. & Alto Saxophone are in other rooms or backstage (audible via mini-loudspeaker)

Folksong and Temporal Polarity

After an introductory section, the work presents a series of duets and trios, followed by what Black describes as a series of refrains contained within a strophic folksong form, interrupted by insertions.[13]

13. Black, 2019.

FIGURE 12 Overall form of *not thinking about the elephants*.



The work is sectional, divided into clearly delineated parts. Rhythmically, Black develops a temporal polarity by moving between freedom (*senza tempo*), and metrical complexity. Sections of the song form tend towards the metrical end of this axis, with a repeating structure of changing meters. Into this structure Black has made *insertions*, or formal interruptions[14] that allow for compositional and performer freedom. These parts were developed in collaboration with the Quasar Saxophone Quartet in Montreal. They tend to be rhythmically free, using proportional notation in *senza tempo* markings, or pulsating metrical music, using aspects of timbre such as extended technique and/or the harmonic series.

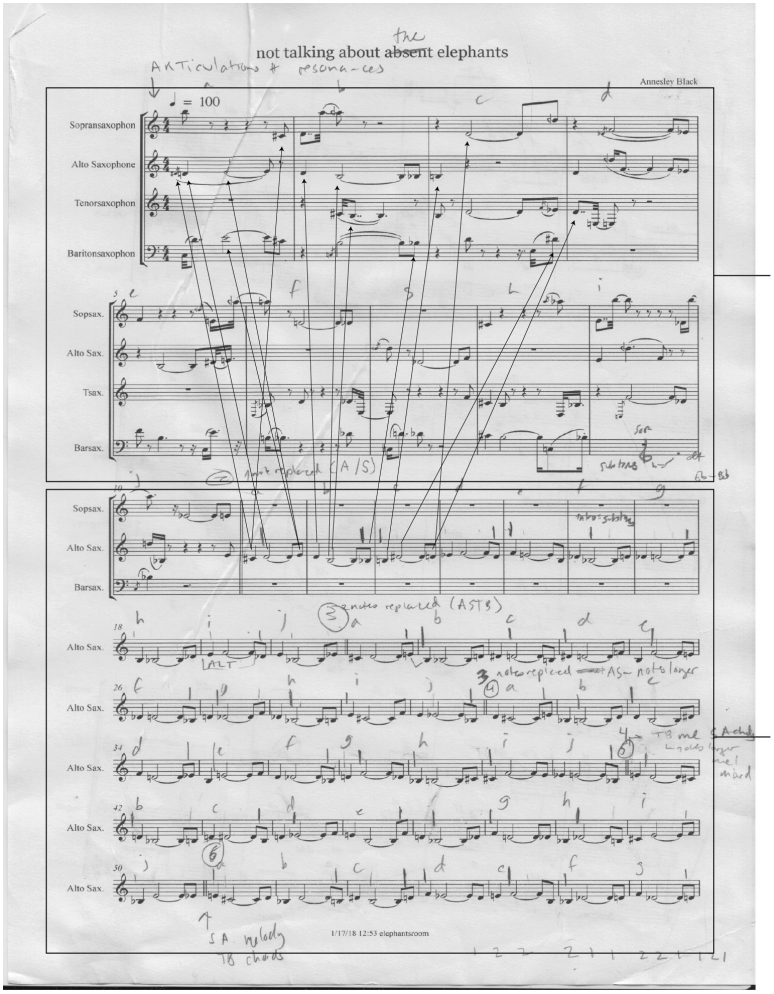
14. *Ibid.*

Black's definition of folksong involves the use of a repeated melody altered with every iteration.[15] However, the original version of the melody is never presented; it serves only as a compositional starting point.[16] In Figure 13 we see the original sketch of the folk melody. At the bottom of the figure, we see a linear sequence of three-note motives written for the alto sax in 4/4 meter. At the top of the figure, the sequence dissipates among the members of the quartet, yielding a pointillistic structure. This stage of the process includes the use of repetition and the free addition of contrapuntal melodic figures filling out the texture.

15. *Ibid.*

16. *Ibid.*

FIGURE 13 Sketch of *not thinking about the elephants*. Linear sequence of trichord material (below), then dispersed over four voices creating the initial melody (above).



The melody undergoes metrical transformations to produce variations. The original version is set in an audible 4/4 meter. Subsequently, two groups of meter sequences are created: (6/8, 7/8, 4/4) and (3/4, 7/16, 2/4), forming an independent metrical structure, which is further varied through repetition, permutation, or insertion of other metrical units. This independent metrical structure is audible, and not a layer of notational abstraction. Yet it also serves as a kind of compositional catalyst.[17] Working in her theme of suppression, Black "forces" the original melodic material into this independent metrical

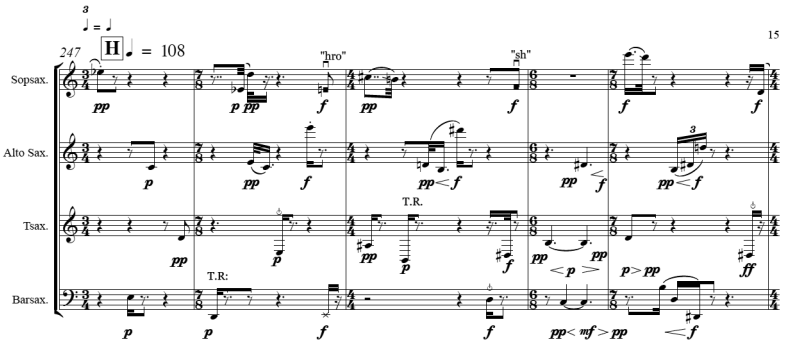
17. *Ibid.*

18. *Ibid.*

structure, a process she describes as looking for the "weight" of a meter.[18] This is intuitive; my analysis suggests that she does it by searching for a specific beat to place a pitch from the melody into. A decision to place a note on the downbeat or an offbeat will have implications for the rhythmic flow of the sequence.

In Figure 14 we see the beginning of *Refrain III* (mm. 247–251), an instance of this restructured melody. At this stage of composition, Black's process is intuitive and difficult to trace. The independent meter sequence is [3/4 (or 6/8), 7/8, 4/4]. The pitch material is reminiscent of the original melody, but Black uses rhythmic shifting, repetition, and octave displacement to explore different ways for it to *fit* in the new meter. The acoustical result is a continually shifting pulse and non-symmetrical repetition.

FIGURE 14 *Refrain* III. Example of the original melody forced into an independent metrical sequence (mm. 247–251). © Edition Juliane Klein.



Black's work here calls to mind Helmut Lachenmann's concept of *dialectal structuralism*:

> music derives its structural detail from a conscious unconscious confrontation with the structures which it helps to establish, which it evokes—and at the same time breaks with, clashes with—structures which the composer may evoke by leaving unmentioned, in order to exorcize them in some way.[19]

19. Lachenmann, 1995, p. 100.

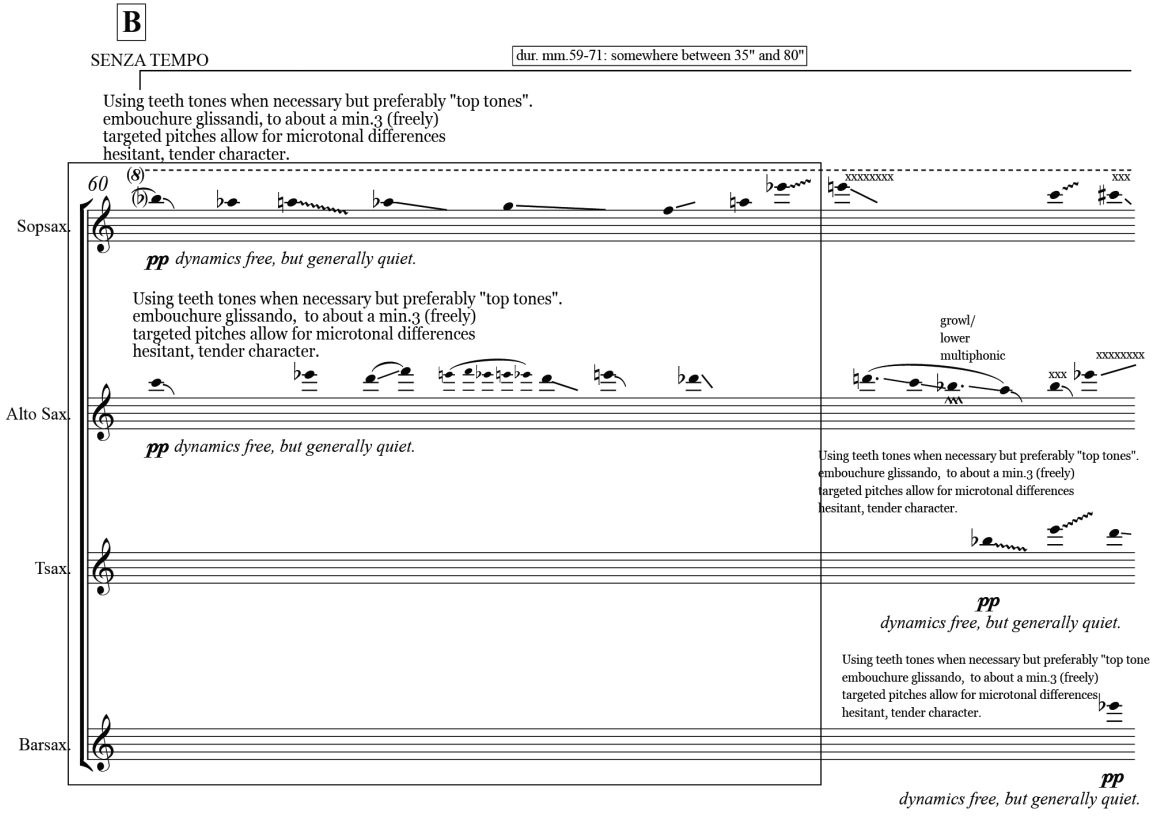
Musical structures derive their strength from resistance, defined as the friction between the music and the forms they suggest. By forcing a melody derived from earlier stages of the compositional process into new meters, Black constructs a compositional dialectic between the melody and the form. Furthermore, by shifting the original melodic structure rhythmically and subjecting it to micro-variations, the material is defamiliarized, allowing the listener to experience it anew each time.

Live Electronics

Three layers define the live-electronics set-up. Layer 1 is the amplification layer: all the instruments are miked and amplified, but the sound of the off-stage soprano and alto saxophones project into speakers placed in the bells of the tenor and baritone saxophones. The placement of the speakers inside two of the instruments has three results. First, it aids in the creation of difference tones. Secondly, this mapping severs the perceptual connections between source and sound.[20] For example, in Section B (mm. 60-71), representing the first insertion section, a dramatic event occurs where we watch the tenor and baritone play *tacet* (Figure 15). At the same time, we hear the sound of the soprano and alto coming through the speakers pitched very high, beyond the tenor and baritone range, evoking the polarity between artificial and real.

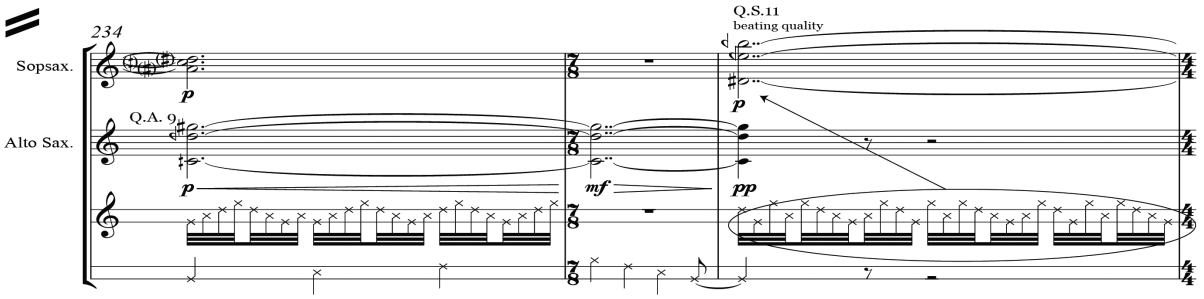
20. *Ibid.*

FIGURE 15 Playing with source-sound identities (m. 60). The high-pitched sounds of the soprano and alto saxophones are projected into speakers placed inside the tenor and baritone saxophones. © Edition Juliane Klein.



Thirdly, the speaker placement allows for the filtering of the soprano and alto sound by the tenor and baritone saxophones (Figure 16). The absence of effects processing and prefabricated sound design is noticeable. Instead, Black blurs the line between acoustic and electronic by using the tenor and baritone like the filtering modules of a modular synthesizer. The tenor and baritone saxophones modulate the incoming signal from the soprano and alto by changing their fingering, thus changing the length of the column of air the soprano and alto tones resonate in, acting as a type of formant filter.

FIGURE 16 Tenor saxophone filtering the soprano saxophone through finger patterns (mm. 234–236). © Edition Juliane Klein.



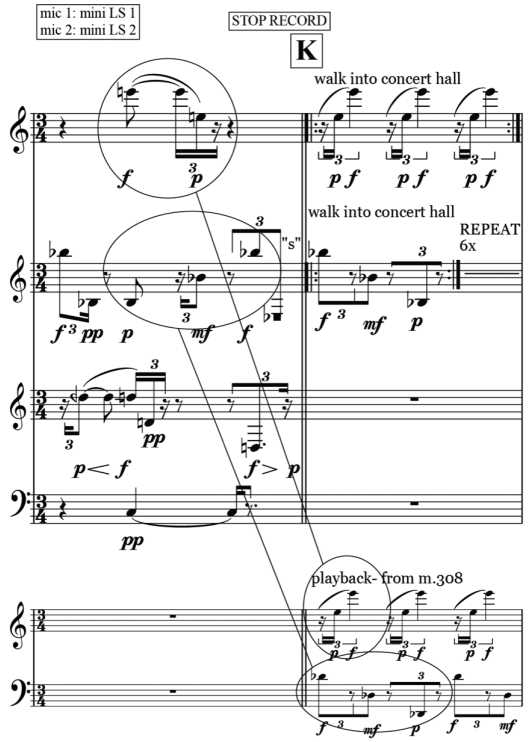
Layer 2 of the live electronics involves the diffusion of the quartet sound to a 4-channel system placed around the audience (see the hall set-up in Figure 11). In early performances of the work, this amplification process was completely improvised to enhance the perceived difference tones created through the interaction between the saxophones.[21] While it is not notated in the score, Black adjusted the amplification of the quartet sound at her discretion. This aspect of the work can only be experienced in a live performance and not in the recording. The play of amplification depends on the space where the piece is presented, and how the sound engineer/composer perceives the quartet at any particular moment.

21. *Ibid.*

In Layer 3, near the end of the piece and representing the most prominent electronic part, Black uses a Pure Data[22] patch to record (sample) the live performance, then cuts, splices, reverses, and reorders this material, playing it back through the mini-loudspeakers. Some of the recorded segments are displaced and repeated, specifically from mm. 309–323, where the playback consists only of material recorded in m. 308 (Figure 17). This electronic part begins at the moment when the soprano and alto saxophones walk into the concert hall.

22. Pure Data is a visual programming language developed by Miller Puckette for creating interactive computer music.

FIGURE 17 Recorded material from the soprano and alto saxophones are spliced, reversed and repeated in the electronic part (mm. 308–309). © Edition Juliane Klein.

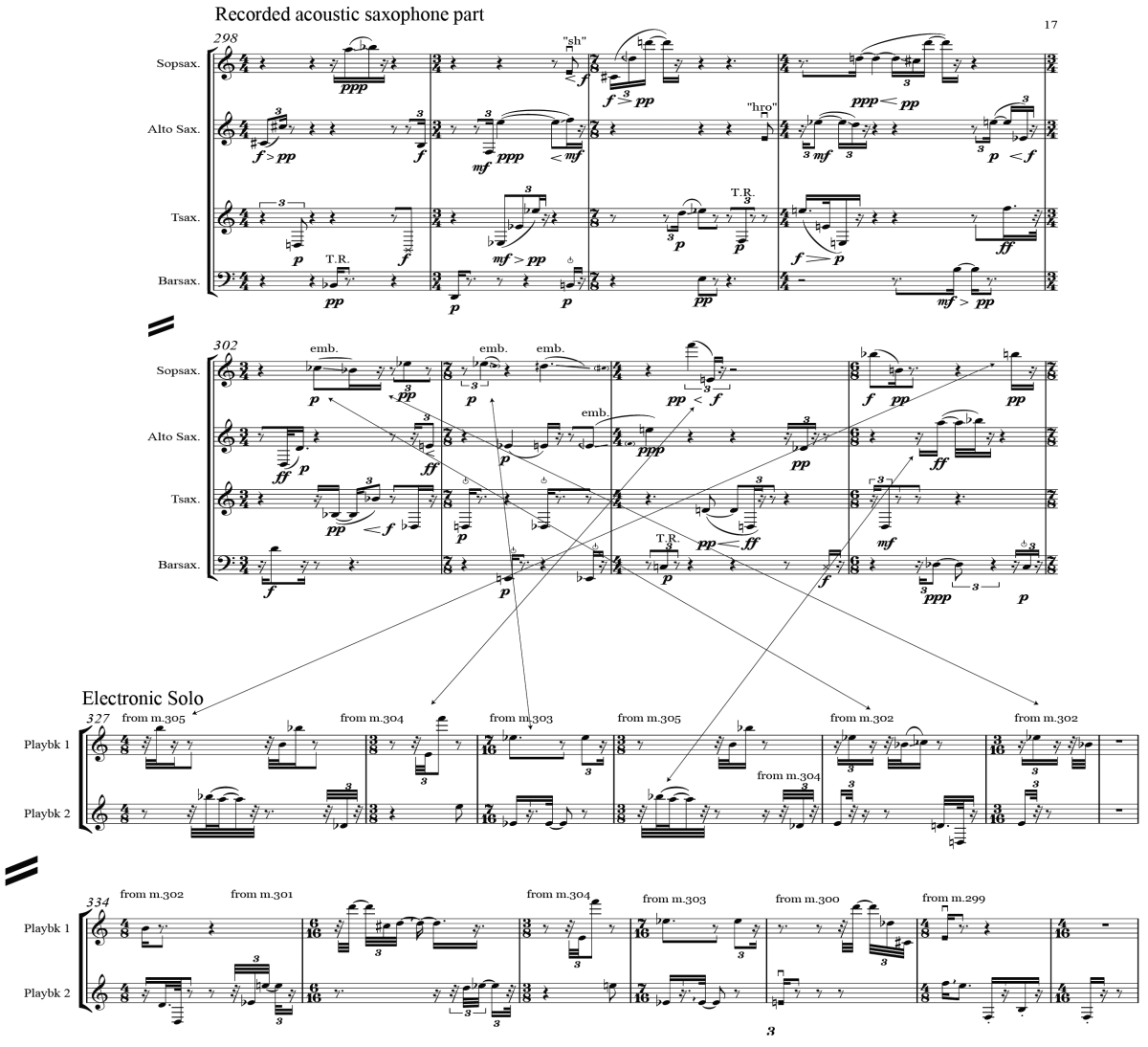


Finally, at m. 327, an electronic solo begins (Figure 18). This solo, diffused through the mini-loudspeakers, derives from material recorded in mm. 299–305. The annotated example in Figure 18 identifies its origin.

During the solo, the tenor and baritone remove the speakers from their bells, and hold them in their hands. This represents an important theatrical and climatic point in the work: material that was once hidden and suppressed in the background emerges and becomes the foreground. Black writes in her notes that the "exterior voices color, shadow, reciprocate, refute or eventually overpower the interior voices."[23]

23. See the score's technical note. Black, 2018.

FIGURE 18 Electronic solo and derived acoustic material. Note: for clarity, not all connections have been annotated. © Edition Juliane Klein.



Conclusion

Annesley Black's work uses the compositional manipulation of various musical parameters and dimensions to dissect, explore, and express conceptual topics. In *not thinking about the elephants*, ideas of suppression and emergence are pervasive. The quartet is severed in half: two of its members (soprano and

alto saxophones) remain offstage and behind closed doors through most of the work. For the audience, their sound also remains acoustically hidden (suppressed), and is projected digitally through speakers placed inside the tenor and baritone saxophones. Their absence could make us forget about half of the quartet, even as we are confronted with their sound emerging from the onstage instruments. This creates a cognitive dissonance between what we hear and what we see, lending the work a strong visual and theatrical component. Furthermore, the use of combination tones (more specifically, difference tones) to create an emergent harmonic structure supplementing the played notes, and the forcing of melodic material into an independent metrical grid both point to this theme of suppression and emergence.

When approaching a piece of new music, we often ask: "How does this composer generate tension in their work?" Black tends to use *polarity*, the juxtaposition and interchange of extremes within a particular dimension. This may be an interplay between the highest and lowest notes of an instrument's frequency range, and may also include extremes in physical and spatial dimensions, such as the absence or presence musicians. Black writes that *not thinking about the elephants* deals with the "psychological implications of isolation, separation and absence."[24] The polarity of absence and presence becomes a contrapuntal, tension-building device. By removing two performers and making them audible only by electronic means we have a sense of their absence, causing us to focus on the two performers onstage and creating a "dissonant" spatial situation. When the "missing" performers are made present at the end of the work, the ensemble comes together, making a "consonance" of sound and source.

not thinking about the elephants is a rich, complex piece of music demanding multiple careful listenings. Black creates musical objects and situations that can be perceived in a number of ways, making it difficult to analyze but also extremely rewarding—creative processes are both systematic and intuitive, background elements become foreground, instrument tessituras and electronic mappings reverse, spatial positions interact with melodic phrases, and the acoustic and electronic mediums fuse. Her language revels in playfulness between extreme polarities and a unity of concept: what is suppressed, inevitably emerges. When confronted with Spahlinger's question, Black's response was profound: "What is sounding is what the composer puts into it."[25]

24. *Ibid.*

25. Black, 2019.

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