Embodiment, Consciousness, and Space-Time: Hannes Taljaard's *Setudes* for Piano

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The artist gives the beholder increasingly 'more to do,'
he draws him into the magic circle of creation and allows him to experience something of the thrill of 'making' which had once been the privilege of the artist.

Ernst Gombrich (1960, 202)

This tribute to the music of Hannes Taljaard, more specifically his *Setudes* for piano, takes sensory cognition as its point of departure. The performer's immediate embodiment of the music and the intuitive auditory awareness of the listening experience facilitate two different ways of perceiving and understanding a kind of music that is not aligned with traditional tonal structures and processes. Insight into the composer's craft as a vehicle for artistic expression represents a third route towards understanding. Allowing for diverse overlapping of actions, the kinetic-tactile connection with music during performance and unmediated experience that allows music to speak directly to the listener's consciousness recreate the composition, thereby completing Ernst Gombrich's 'magic circle of creation'. Sensory experience is linked with the idea of craftmanship in the service of the art by finally considering the composer's shaping of music in time and space. This essay deals with the four-dimensional concept of space-time in the discussion of Taljaard's *Setudes* in order to show how the static idea of the moment is transformed into the dynamic idea of becoming in musical perception.

Inspired by Hannes Taljaard's music, this essay took on a life of its own - it developed its own momentum and direction. It also took me along unplanned routes that led me out of my comfort zone into diverse neighbouring but overlapping fields ... [1]

Hannes Taljaard composed four *Setudes* for piano in 2003-5, a time that not only marked the beginning of a new century but also a resurgence of interest in the experience and understanding of music.[2] Since the publication of John Sloboda's *The Musical Mind: The Cognitive Psychology of Music* in 1986, the scope of studies of music psychology reached beyond music perception, music cognition, remembering, creating, performing, responding to music and music therapy to include, amongst other things, literature, linguistics and pedagogical issues, as well as interdisciplinary connections with neuroscience and psychophysics.

In the light of such a vast and complex field of interdisciplinary studies, a strategy had to be found to enhance understanding of a musical work that is written in a style that is not familiar to most listeners. The route that I have chosen takes as its point of departure the idea of the 'beholder's share', a term that Ernst Gombrich (1960) discussed and demonstrated in Part III of his *Art and Illusion*: *A Study in the Psychology of Pictorial Representation*. When the concept of the beholder's share is transposed from the visual arts with their spatial connotations to music as a temporal, sonic art, the listener can also be regarded as an agent who can complete Gombrich's 'magic circle of creation'. More specifically, the notion of doing or making that physically frames the 'magic circle of creation' suggests that the privilege of becoming part of the circle requires the performer's active involvement (doing or re-creating the work in performance) and the listener's perceptual re-creating (remaking) it. John Dewey (1934, 47) points out that '[a]rt denotes a process of doing or making' when he refers to the shaping of physical material. But doing or making can also be understood in the abstract sense when actions of the perceiver's mind are involved. Composer Linda Dusman (1994, 130) believes that the audience member, performer and composer shape 'the reality in which performances are perceived'.

The idea of doing or making is implied in the title of *Setudes* – one explanation for this unfamiliar term being that it can refer to a set of etudes or studies. So, to begin with, I have used the meaning of the term *etude* as point of departure when trying to find a way to understand Taljaard's *Setudes*. The first meaning that the French term *étude* evokes is normally that of a study or an exercise. Most definitions of the term mention the development of the performer's technique by concentrating on a specific technical problem. The etude as genre reached their artistic heights in the 24 Etudes for piano by Chopin (Opus 10 and Opus 25), which require the complete merging of the performer's technical skill and artistic expression. The idea of demonstrating skill can be translated into the domain of the composer, namely, the etude being an exercise that demonstrates the composer's mastery of his/her craft in the service of artistic expression by focusing on a specific compositional strategy. An example is Stravinsky's use of the term in *Four Etudes for Orchestra*, 1928–9 (Grove Music Online, 2001). But more specifically aligned with my basic argument in this essay is the idea of doing and making that Stravinsky links with poetics. In his Charles Eliot Norton Lectures delivered at Harvard College during the academic year of 1939–1940 and which were published as *The Poetics of Music in the Form of Six Lessons,* he declared that 'I shall not forget that I occupy a chair of *poetics.* … The verb *poiein* from which the word is derived means nothing else but *to do* or *make*' (1947, 4, original italics).

Performing, listening and composing are tasks that, to a greater or lesser degree overlap.[3] For example, the performer experiences movement and sound as a whole. In the discussion below I shall focus on the dominant activity of each of the three agents, namely, the performer, listener and composer.[4] The objective of this article is then to show how three divergent ways of understanding converge to make sense of Taljaard's *Setudes* for piano. The focus is on the acts of these agents and their diverse modalities of experience when interacting with a kind of music that is not aligned with traditional tonal structures and traditional musical content. After I wrote this article I asked the composer, Hannes Taljaard, and a performer, in this case Waldo Weyer, for their reflections on this project, because I wanted to be as inclusive as possible. In order to sustain the flow of the article, however, their comments will be provided in the endnotes, preceded by either HT or WW.

In the pursuit of understanding atonal music, the absence of tonal, goal-oriented structures is a problem because studies in music perception often focus on predictive processes and predictive patterns.[5] 'The tonal piece … rests upon a predictive model that assumes a tonal goal-directed force, as condition behind the observed patterns' (Leman et al. 2018). It appears as if structural concepts are fixed in and prescribed by common practice tonality, and so are our music perception and conceptualisation. Composer

Linda Dusman went so far as to accuse the valorisation of the tonal tradition as the reason for setting up a binary oppositional view in which 'new music can be nothing but the Other in the presence of a historic tonal majority'. This implies that 'our cultural Other, new music, is irrational, abnormal, and, by implication in our binary culture, culturally weak and ineffective' (Dusman 1994: 131, 133).[6] She went so far as to question 'our cultural assumption that knowledge ... is a necessity for successful engagement with music' (Dusman 1994, 137).

The notion of static vertical structures does not account for that characteristic which distinguishes music from the other arts, namely its sonic temporality and all the expressive effects that are caused by the way in which music is shaped over time. The difference between the music of the moment (vertical structures) and the becoming of music through temporal flow will be discussed below.

There are many ways of understanding music, but this article focuses on sensory cognition by taking account of kinetic motor understanding (which is here represented by the performer), aural awareness (that involves the listener) and craftmanship in service of the art (the composer). By focusing on the actions of performing, listening and creating, this strategy represents understanding by means of embodiment, consciousness and the shaping of music in space and time. By involving sensory knowledge, this essay attempts to show that structural analysis is not the only route to follow in the quest to understand atonal music. Of the five traditional senses – sight, smell, hearing, taste and touch – only sight, hearing and touch pertain to music. However, this article also draws on what have been called the sixth and seventh senses, namely proprioception (body awareness) and the vestibular sense (balance and spatial orientation). Neurologist Oliver Sacks (2015, 47) describes proprioception as 'that continuous but unconscious sensory flow from the movable parts of our body (muscles, tendons, joints), by which their position and tone and motion are continually monitored and adjusted, but in a way which is hidden from us because it is automatic and unconscious'. Proprioception is also referred to as kinaesthesia. The vestibular sense which is primarily located in the inner ear controls the body's sense of balance while sitting, standing or walking.[7]

It is not possible to discuss secondary questions such as to what extent knowledge or cognitive understanding is sufficient for musical understanding, and the relationship between rational knowledge and intuitive or sensory knowledge. For me these complex issues resonate with the question posed by the celebrated author Gustav von Aschenbach at the beginning of his monologue in Benjamin Britten's *Death in Venice* (1973): 'Does beauty lead to wisdom, Phaedrus? Yes, but through the senses.'[8] This monologue is based on the dialogue between Socrates and his young admirer, Phaedrus, on the persuasive use of words.[9] It is heard near the end of the opera, which is based on Thomas Mann's novella *Der Tod in Venedig*. The monologue reflects the 'dialectic relationship between discipline and inspiration' and the artist's inner conflict between his 'rational consciousness and his irrational subconscious' (Spies 2002, 12). Without even trying to resolve these complex issues, suffice it to say here that relying only on one of the agents in these opposites is not viable because beauty without wisdom (referring to Aschenbach's monologue) is not possible in the arts, nor is inspiration without discipline, nor intuitive insight without rational knowledge, and nor is understanding without knowledge.[10]

The notion of an oppositional dualism within the mind, namely 'the part which is known, and the part which is not', is most often ascribed to the philosophy of the eighteenth-century French philosopher René Descartes (Meltzer 1995, 148). Although 'Dewey does not separate artistic practice from intellect' in his chapter on 'Having an Experience' in *The Art of Experience* of 1934 (Leddy 2006),[11] a similar disjunction that underlies the mind-body dualism of Descartes can be found in the opposition of theory and practice within music as a discipline. (David and Eric Clarke describe the mind-body dualism as a

Western phenomenon 2011, xxii). More specifically, in the understanding of musical time (under the heading 'Philosophical categories') Mark Delaere (2009, 29) distinguished between *ontological time* and *psychological time*, with *being* and *becoming* respectively listed in these two categories. The question is, however, whether it is possible to talk about temporality or the becoming of structures without understanding the structures themselves. On the other hand, the notion of becoming is often ignored in a structural approach to musical understanding.

In order to understand the mutual interaction of conceptual categories, 'to discover the abstract principles that account for their coherence into a harmonious whole', analysis must be followed by synthesis (Hyer 1996, 79). But 'our minds must be calibrated to material phenomena, and it is the magical fact of this adjustment – the apparently natural interface between our senses and objects in the material universe – that forms the basis for aesthetics' (80).[12] The 'claim of the senses to yield knowledge' was already discussed in the imaginary conversation between Socrates and Theaetetus as documented by Plato; it involved 'the world of transient becoming and ambiguous appearance, revealed by the senses' (Cornford 1935, 7; 12).[13] In his commentary on the *Theaetetus* F.M. Cornford describes the meaning of perception as follows: 'In ordinary usage *aesthesis*, translated "perception", has a wide range of meanings, including sensation, our awareness of outer objects or of facts, feelings, emotions. etc.' (30).

Before dealing with understanding from the performer's point of view, the use here of the term *perform*, as well as *performing* and *performance*, must first be clarified. For the purpose of this discussion of Taljaard's *Setudes*, performance is regarded not only as a product in the sense of a once-off event as experienced by the audience. The process of learning and mastering a piece of music when preparing for a performance is also included as part of performing, because without this preparation the performance would not be possible. In the broadest sense the word also enters the sphere of the term *performative*, which points to an action, that is, doing something. In this article I use performance as an indication of the performer's physical action (representing the outer, physical world), and performative as action that generates an emotive effect in the mind of the performer and the listener (representing the inner world).[14]

Part I : Performing as Embodied Awareness

The musical work becomes a reality when it is performed, when the 'per' in 'perform' (as intensification of 'form') results in 'to form very thoroughly', when the performer becomes physically, mentally and artistically part of the music, and when understanding the music on a sensory level translates into artistic expression. Until then it remains a construct of the mind that is notated as a physical score. Performance entails an act of embodiment where the physical involvement of the performer creates direct access to the music through a combined visual, sonic and tactile experience establishing a kind of knowledge that could initially be regarded as pre-reflective and pre-analytical. Because the pianist is in immediate contact with the keys, he/she can shape the music as it proceeds through time, for example, by changing tempo, dynamics, touch or articulation, either gradually or suddenly, or by understanding and demonstrating the effect of various kinds of texture (e.g. thick or thin, multilayered or monodic) and their respective functions in the interpretation of the music. According to Lawrence Kramer (2002, 3), 'music collapses the sense of distance associated with visuality, and more broadly with the whole field of concepts, images, and words. The resulting sense of immediacy tends to feel like bodily self-presence, the intimacy of oneself with one's own embodiment' (Kramer 2002, 3). Shaping the music to project a musical message is the result of how musical time 'is *experienced*, rather than *conceived*' (Crispin 2009, 8, original emphasis).

For Kramer 'music is *interpreted* by being performed. The performer's actions both reproduce the music and produce an understanding of it' (Kramer 2011, 1, original emphasis). Five years later he echoed this understanding of the physical bond between a work

and its performance: 'Embodied experience, embodied music, is thus just as subject to interpretation as music considered apart from particular performances, that is, what we call the work. Each is ultimately just a precondition for the other, already latent in the other in an active rather than a passive sense' (Kramer 2016, 145). But this embodied experience does not communicate a specific message. From an educational perspective David Elliott (1995, 58, 105) describes the actions of making music 'as the "em-body-ment" of musical thinking, knowing, and understanding' and regards the 'artistic performance [as] the ultimate nonverbal description of a work', because 'all its relevant dimensions come together as a whole'.

Embodied music cognition focuses on the human body as mediator in the perception of music (Leman and Maes 2014, 236). But the relationship between action and perception is complex, because embodiment is one 'component of our understanding of the sensorimotor basis of the encoding and decoding processes involved in musical interactions'. Although research into embodied music cognition has flourished in this century, the 'synergy between bodily and musical processes' had already been investigated a century ago by the Swiss composer, conductor, music educator and writer, Emile Jaques-Dalcroze (1921) (Seitz 2005, 419).[15]

Views on embodied cognition (EC), however, are divided. For example, Stephen Goldinger et al. (2016, 967, 973, emphasis added) 'consider *conceptual* knowledge difficult to reconcile with EC', concluding that 'EC falls woefully short ... of addressing any aspect of *cognitive* life'. Reading the negative comments about research results on embodied cognition, one realises that rigorous thinking may be required, especially in the light of the binary oppositions mentioned earlier. The complexity of this situation compels me to return to Aschenbach's monologue once again, most probably prompted by the question mark hovering over the ascending melodic figure E-E-G against 'Does beauty [lead to wisdom, Phaedrus?]'. This may suggest that 'Aschenbach realizes that his conception of beauty might not have the kind of future that he had envisaged' (Spies 2002, 10-1).

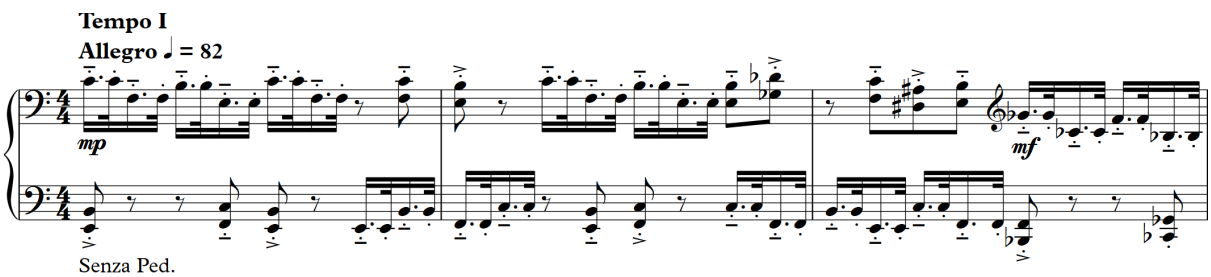
Dusman (1994, 136) contends that in binary thinking 'the act of music ceases for the listener. ... Because defining is binary and music is not, the act of defining is opposed to the act of music and at the moment of definition the ability to experience the phantasmagoria "music" ceases to exist'. Indeed, already in 1934 Dewey had written: 'Since rigid conceptualization is compelled to take place on the basis of principles and ideas that are framed outside of direct esthetic experience, all such performances afford good examples of "cerebral revery"' (Dewey 1934, 223). By its nature a simplistic binary opposition (such as cognitive understanding – embodied cognition) usually does not promote the kind of nuanced thinking that is a prerequisite for the clarification of complex issues, especially when preconceived prejudices are involved. What should become clear, at least, is that the comments regarding embodiment below pertain specifically to Taljaards *Setudes* and that the outcome of this investigation cannot be extrapolated onto other music in order to establish a general theory about embodied music cognition (EMC). In the words of John Sloboda (2005, 175-6), who regards himself as a psychological scientist, 'if we could derive an all embracing theory, then music would lose its mystery and power'.[16]

In the absence of an established musical syntax and semantics that are appropriate for understanding the *Setudes* (for example, the music is atonal or non-tonal without being serial), the embodied experience acquired through tactile stimuli may be regarded as a kind of knowledge that could guide understanding.[17] Direct bodily interaction with the music is a kind of knowing in action; furthermore, it is immediate because the performer is physically immersed in the music – he/she can feel how bodily movements mediate musical signification as the music unfolds in time.[18] By linking physical action with perception, the focus here is on sensorimotor processing that is established through bodily, tactile and sonic understanding.[19]

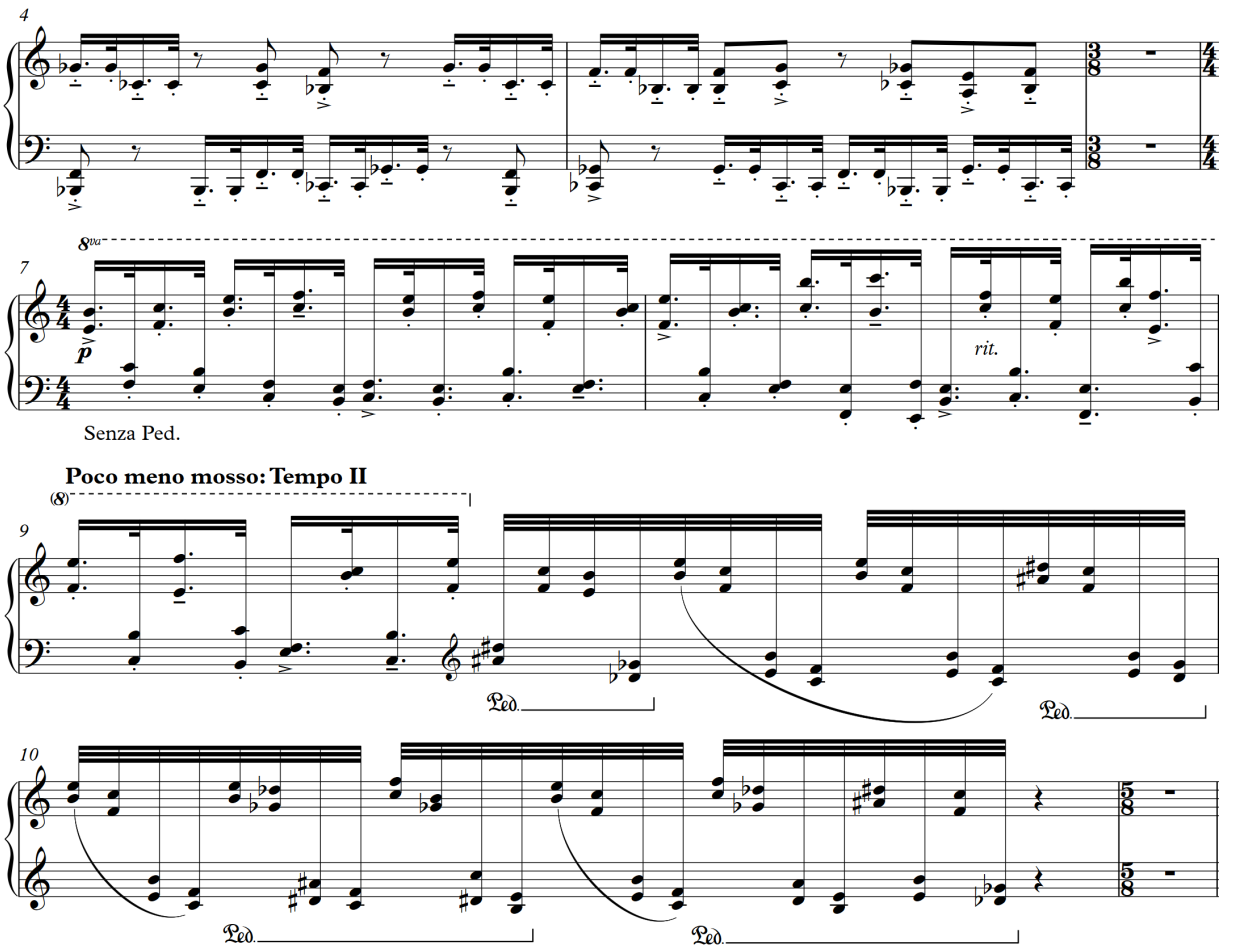
Interpreting the *Setudes*, for example, the pianist may be guided by feeling the thickness or thinness of a sound formation, whether it is a vertical construct or its horizontal extension through repetition or prolongation.[20] Also, an awareness of changing dynamics, register, tempo, texture, or the nature of the sound band may help to broaden the concept of progression, which is normally associated with harmonic progression within tonality as a directed tonal force. When the performer directly experiences the physical space between two neighbouring notes and by being conscious of spaces within pitch structures, he or she can distinguish between various kinds of formations without labelling them precisely in music theoretical terms.[21] This kind of musical experience is unmediated, in other words, no theoretical systems of analysis need to be mastered before making sense of music in its vertical and horizontal manifestations.[22]

Immediate awareness of the way in which the composer exploits the particular mechanism of sound production of an instrument can also guide understanding. In the case of music for the piano, this would be its characteristic hammer action. Contrary to the sound production of stringed instruments, where the performer can sustain a tone and even increase its volume, the sound of the piano dies away as soon as the hammers strike the strings. In order to create a stream of sound when writing for the piano, pitches have to be repeated, or more specifically in the case of *Setudes*, the hands alternate. The pianist's hands then help to shape the band of sound and this action involves motor and auditory domains. Especially when the music moves at a fast tempo, the experience of this continuous stream of sound is one of direction and force. (The way in which pitch is organized within auditory streams will be discussed in Part III.) The choice of a suitable tempo is, however, crucial because a tempo which is too slow will affect the flow of the music, while too fast a tempo might have a negative effect on the listener's perception of the music.

The opening of Setude II will be used to demonstrate musical understanding through bodily-kinetic awareness (see Example 1).[23]



Example 1: Setude II, bars 1-11.



Example 1, continued.

By just looking at the first page of this first setude, it becomes clear that the absence of the traditional texture of melody and harmony, or isolated melodic motives and triads, requires a new way of understanding. The first step, then, is to identify points of arrival that demarcate cohesive units, because they could be compared to the end of sentences in verbal communication or to cadences in tonal music. The most obvious pointer towards such a moment in the music is when this point is followed by a rest or rests, thereby setting up a 'frame' of music. Within a frame the music is shaped through crescendos, diminuendos, accelerandos, ritardandos, changes in dynamics, articulation, accents, tempo, etc. An initial glance shows that bar 6 and bar 11 of the first 11 bars are silent, resulting in a 5 + 4 bar segmentation. I prefer to use the term *frame* instead of *phrase* for such an isolated unit, because of the latter word's association with motivic (often tonal) design.

What one sees in the first two frames is a band of sound, marked *Allegro*, moving with kinetic energy through time and space. (For a graphic representation of the outer contours of the band of sound, see Fig. 1.) It is conspicuous that this band of sound expands and contracts in bar 7 and in bar 8, a sonic image that could be compared to the vertical combination of two open fans that mirror each other. A closer look shows that

the second mirrored fan image is greater than the first one with regard to vertical space and that it is actually prolonged into the second beat of bar 9, leaving the last third of frame 2 to settle down over 5 beats. The way in which the music is shaped may be regarded as a kind of progression from a small mirrored fan image, through a bigger one to reach a point of arrival in the third beat of bar 9 through the *rit.* at the end of bar 8.[24]

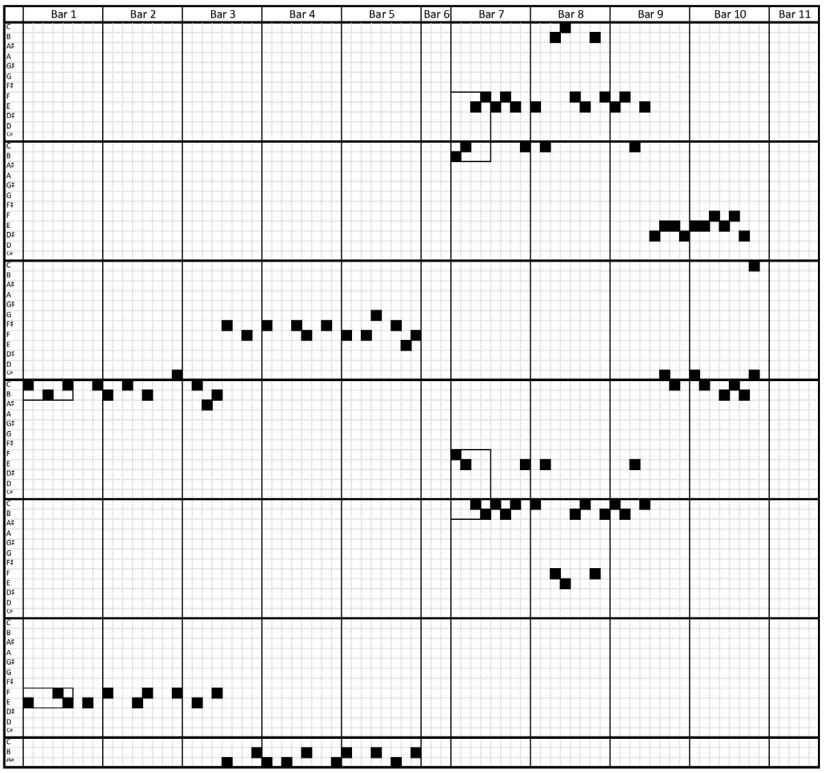


Figure 1 : Setude II, frames 1 and 2, band of sound, outer contours.

The band of sound in frame 1 has generally speaking a more stationary character when compared with frame 2. So, the nature of the soundband within the first two frames represents a kind of progression, from relative stability to fluctuation ending with a point of arrival in frame 2.[25] It is also clear that in a number of ways the five bars of frame 1 differ from the four bars in frame 2. Apart from a general motoric movement that the two frames have in common, they differ with regard to

- specific kinetic embodiment (hands are synchronized in frame 1, but alternate in frame 2);
- texture (the band of sound is porous because of rests that alternate between the two hands in frame 1, but frame 2 consists of a flowing, continuous band of sound with no rests, moving halfway through by way of a *rit.* to the second tempo marked *Poco meno mosso* in bar 9);
- the dynamics (moving from ***mp*** to ***mf*** in the second half of frame 1, but ***p*** throughout frame 2);
- the outer contours of the sound band (stationary on two levels in frame 1, but mirrored fan shapes with the last third of frame 2 more or less stationary);

- the range of the sound band (increasing in the middle of frame 1, range fluctuating in frame 2);
- the register of the upper border of the sound band (low versus high);
- structure (second half of frame 1 is a sequence of the first static half, expanding the band of sound when the upper and lower borders move an s6 interval higher and lower respectively, while frame 2 has a flowing, developing character[26]); and
- accents (prominent and regular in frame 1, but far fewer accents that become irregular after the *rit.* with no articulation marks in the last third of frame 2 as if coming to rest).[27]

The pianist's tactile connection with the keys immediately foregrounds the opening C-B-C semitone movement that is isolated by a rest and which is prominent in the upper border of the band of sound. This pattern is mirrored by E-F-E in the lower border, the idea of a mirror pattern here being replicated on a micro level. At the beginning of frame 2 the four pitches unfold in time to broaden the idea of the opening mirror image: B-C-E-F in the upper contour is a mirrored version of F-E-C-B in the lower contour. (See Fig. 1.)[28] When the opening material returns on the upbeat of bar 104, the original right-hand pattern with the dotted rhythm (bar 1) is now played by the left hand and the right hand plays the accompaniment figure (consecutive s7 dyads).

The listener will be able to follow many of the above-mentioned auditory phenomena relating to Setude II, that is, phenomena that concern dynamics, register, tempo, kinetic energy, the nature/characteristics of the band of sound, etc.[29] When listening to Setude III, however, immediate awareness as embodied in *sonic experience* is the obvious route to follow for the listener who does not have the advantage of the performer's tactile opportunities, or the compositional knowledge of the composer. The listener relies on direct auditory experience, especially because the idiom is unfamiliar. But before dealing with auditory perception with regard to this setude, it is necessary to take a brief look at the function and status of the listener.

Part II: Listening and the Flow of Consciousness

My argument is based on the notion that consciousness is represented by the idea of temporal flow, that is, as it appears in literary works such as James Joyce's *Ulysses* (Steinberg 1968, 49). The reasons why music can be linked so directly to the flow of consciousness are, firstly, that 'music models, moulds, and makes audible the flow of our inner, subjective life', and secondly, that 'these processes and their musical analogues are by definition *temporalities*' (D. Clarke 2011, 1, original emphasis).[30]

In the 1890s pioneer psychologist William James used the metaphor of a river or a stream to describe consciousness, referring to it as a 'stream of thought' (Montague 2011, 31).[31] Edmund Husserl (1859-1938) 'held consciousness to be the very grounding condition of our knowledge of the world, with the consequence that philosophy must understand the world as it appears to consciousness, that is, to us as subjects.' (D. Clarke 2011, 1). When the listener acts as pre-reflective subject, understanding Taljaard's *Setudes* may link with phenomenology because, amongst other strategies, it 'considers the world to be already there before reflection begins', it is also 'a search for a philosophy that accounts for space, time and the world, just as we experience and "live" them' (Kockelmans 1999, 665).

Dewey (1934, 219) distinguished between the 'physical product' and the 'esthetic object, which is that which is perceived'. When the beholder recreates a work in his/her imagination, that is, in perception, 'consciousness becomes alive' (Leddy 2006). But listening as an art, more specifically as an imaginative recreative art, has not received the attention it deserves. (Listening as an art entails more than the mere auditive recognition of musical elements such as intervals, scales, chords, rhythms, etc.) In *Music and Consciousness* Eric Clarke (2011, 196, 197) writes that '[t]he psychology of music is now well over a century old, and yet still offers few attempts to document the direct experience

of listening' and that the 'phenomenology of musical listening is still a poorly developed field'.[32] In 2012 David Hargreaves argued that 'the creative aspects of music *listening* have been neglected, and that putting these at the centre of musical creativity (which is usually seen as being manifested in the activities of composition, improvisation and performance) can lead to a more fundamental view of *imagination* as the cognitive basis of musical activity' (Hargreaves 2012, 539, original emphasis). A greater emphasis on auditory experience through repeated listening will enhance the listener's appreciation for non-tonal music because new sound patterns become familiar.

The work as object becomes a work of art when a perceptive listener completes the 'magic circle' – 'the actual work of art is what the product does with and in experience' (Dewey 1934, 3). As a perceiver, the listener of music may be compared to a viewer in the visual arts, and the reader in the literary arts. The idea that a 'painting is not complete until the viewer responds to it' was conceived by Alois Riegl, as Nobel Prize laureate Eric Kandel (2013a) points out in his video entitled 'How Your Brain Finishes Paintings'.[33] Riegl, an art historian in Vienna of 1900, used the term 'beholder's involvement' or 'beholder's share' when referring to the phenomenon of the viewer who 'interprets what he or she sees on the canvas in personal terms, thereby adding meaning to the picture' (Kandel 2013b). 'Two of his students, [art historians] Ernst Kris and Ernst Gombrich, pointed out that what the brain does is recreate the work of art', even though of a 'lesser magnitude' (Kandel 2012). Kris and Gombrich 'argued that a work of art is inherently ambiguous and therefore that each person who sees it has a different interpretation. In essence, the beholder recapitulates in his or her own brain the artist's creative steps' (Kandel 2013a; 2013b).

In his *New York Times* article entitled 'What the Brain Can Tell Us About Art', Kandel (2013b) concluded that 'the real "eye" of the beholder is the brain itself'. Recent interest in brain-imaging techniques 'led to an explosion of research in cognitive neuroscience, with music becoming increasingly recognized as an important aspect of human intelligence' (McGuiness and Overy 2011, 246-7). For example, the article entitled 'Involuntary Motor Activity in Pianists Evoked by Music Perception' used melodies in a magnetoencephalography (MEG) experiment in which the researchers compared 'the motor activation in pianists and nonpianists while listening to piano pieces' (Haueisen and Knösche 2001, 786).[34] My essay, however, does not aim to resolve the dualism of brain and mind but focuses on psychological issues of perception, because '[n]eural mechanisms are ... not available directly to consciousness: we do not, for instance, hear the individual vibrations of frequencies above 20 Hz, but rather their synthesis into a pitch and timbre' (McGuiness and Overy 2011, 250).

The focus on the perceptive reader flourished after 1960, the year in which Gombrich published his *Art and Illusion*, which is the source of the epigraph of this essay. One of the pioneers of reception theory in literary theory is Hans Robert Jauss (1982), co-founder of the so-called Constance School of German Reception Theory.[35] For him the reader is not passive because the 'historical life of a literary work is unthinkable without the active participation of its addressees' (Jauss 1982, 19). Because a literary work exists within a dialogue between text and reader, it 'is not an object that stands by itself and that offers the same view to each reader in each period' (Jauss 1982, 21). Wolfgang Iser (1974, 275), a colleague of Jauss at Konstanz University, also regards reading as an active and creative process, because the literary work 'comes into being' when text and reader converge.[36] But the reader approaches the written text 'with its own particular history of experience, its own consciousness, its own outlook' (Iser 1974, 284).[37] The same argument applies to music – the work as object may remain constant, but by its varied recreations in the listener's consciousness, it becomes dynamic because every listener has an individual way of listening and an ever-changing range of personal and cultural contexts. Even the same person notices something different when relistening to the same work.

Although certain aspects of reception theory in literature and the visual arts may be relevant to the

listener of music, the act of listening follows a course of its own because the communication is non-verbal, relying on signification by means of sonic signals. Perceptual experience of music relies on sensory input and the imaginative recreation of sonic data to represent an auditory image of the work in the mind of the listener. In the case of György Ligeti, for example, who stopped 'short of dismissing serialism outright' after the 1950s, this imagery in sound turned out to be sculptural in nature (Steinitz 2003, 94, 96). He regarded the direct manifestation of compositional structures on a sensory level as of prime importance (Ligeti 1971, 513).[38] For pianist and scholar William Kinderman (2012, 12), a 'musical work is not an abstract entity but an experience in sound and time. ... Our apprehension of unity or integration is wholly dependent on our internal sound image, or *Klangvorstellung,* of the music' (Kinderman 2012, 12). Although the 'brain's location and identification channels are located in different regions of the brain', Elliott (1995, 82) points out that 'the conscious acts of locating, identifying, interpreting, and understanding sights and sounds ... are most likely coincident in consciousness'.

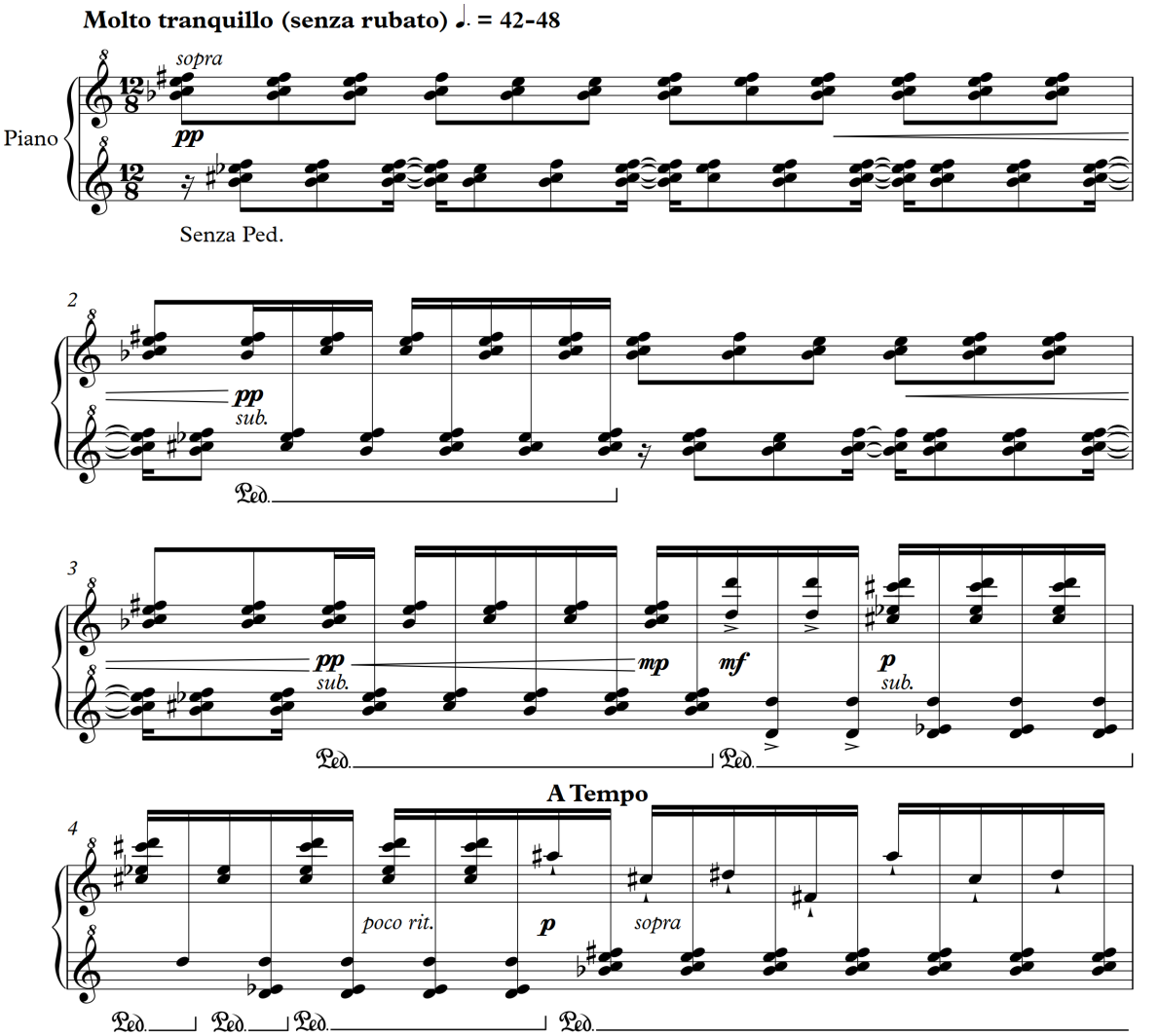
A *stream of consciousness* is 'a continuous flow of ideas, thoughts, and feelings as they are experienced by a person'. As a style of writing it 'expresses this without using the usual methods of description and conversation' (Hornby 2015, 1496). Because human consciousness is a kind of understanding that goes beyond words, it requires immediate involvement when listening to music. How can the ineffable be communicated to the perceiver without appropriate conceptualization and a vocabulary to do so? Can 'I hear' be regarded as being of similar significance as 'I know'?[39] The problem is that the listener's perception has been conditioned by structures embedded in tonality which does not promote new ways of listening. Co-editor of *Music and Consciousness*, Eric Clarke, writes that a structural approach to musical listening comes at the expense of 'domains of musical experience (texture, gesture, timbre, space and feel/swing/groove) that are in principle thoroughly available to consciousness' (E. Clarke 2011, 197).[40]

Atonal music requires a way of listening that links onto ideas beyond traditional music theoretical knowledge and beyond dealing with the surface of the music. When decoding complex pitch structures is not a prerequisite for understanding, it relies more on sensory experience and intuitive awareness. This kind of pre-reflective, pre-analytical musical understanding requires an active engagement with the music, one that represents a new way of listening, one that does not rely on the syntax and semantics of tonality.[41] Although systematization of music theoretical knowledge is certainly necessary in teaching and learning, systematized knowledge on its own is not sufficient to promote appreciation of music as artistic expression. In the field of music education Elliott states that '[t]he basics of music are not melody, harmony, and so on; the basics of MUSIC are the practice-specific thinking processes that musicers and listeners use to construct musical patterns in their auditory, artistic, and contextual fullness' (Elliott 1995, 97).

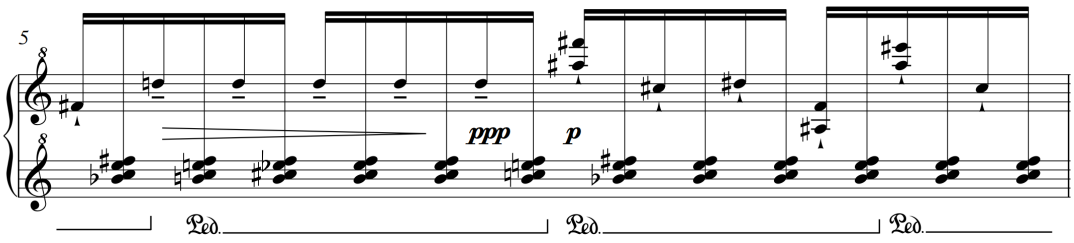
On a pre-analytical level, in immediate engagement with the music, the listener does not hear isolated acoustic elements, but rather a continuous stream of coherent musical patterns that are perceived within a specific context. Indeed, the first two chapters in *Music and Consciousness* show that temporality is 'a fundamental and recurrent link between music and consciousness' (Clarke and Clarke 2011, xxi). A greater concern with the diachronic dimension of music, that is the idea of succession, can promote understanding. This idea of succession in music manifests itself by the way in which texture, tempo, rhythm, register, timbre, articulation and dynamics are manipulated to shape the music over time, to create a stream of consciousness.

When listening to Waldo Weyer's interpretation of Setude III on YouTube, the first impression is one of contemplation created by a vibrating band of sound, marked *Molto tranquillo (senza rubato)* (Taljaard 2012). The vibration that signifies a steady stream of thought on *pp* level is created by the alternation of two overlapping tone clusters.[42] After three crescendos, the first two returning to the original

dynamic level, marked *pp. sub.*, sparks escape from the auditory stream. The accented interjections by pitches outside the band of sound disturb the meditative effect. Four accented Ds alternate in doubled octaves, marked *mf* (bar 3), to retreat immediately to *sub. p* level, the Ds now blurred by the neighbouring notes C♯ and E♭. In the next bar, staccatissimo sparks erupt in the right hand after a *poco rit.* but marked ***p*** *a tempo*, projecting a pattern of two descending s9 intervals (A♯-C♯ and D♯-F♯) which are repeated (bar 4). The staccatissimo sparks alternate with a four-note cluster played by the left hand, the cluster originally played by the right hand at the beginning of the piece (B♭, C, E, F♯).



Example 2: Setude III (bars 1 - 5).



Example 2, continued.

The way in which the music has turned out thus far made me reconsider my original impression and my own stream of thought suddenly takes on a course of its own: could the music be understood as representing a dialogue, more specifically one where the first voice is represented by the stationary, vibrating effect and the second voice by the escaping sparks? After the four Ds have been quickly blurred by the neighbouring notes and by the *staccatissimos*, D as single note returns in bar 5. Now it alternates five times with a surrounding cluster, the dynamic level subsiding in the middle of bar 5, the *decrescendo* ending at *ppp* level. The *tenuto* signs on the five Ds create a lingering effect, as if trying to make a point. The crystallization of D made me take a closer look at the band of sound at the beginning of the setude – the two alternating clusters contain all the pitches within the s8 interval B♭-F#, but the middle note, D, is omitted. But if you look further, as in Part III that deals with the manipulation of pitch, the two vertical structures at the beginning of this setude are actually two whole tone structures that, when they are combined, are disguised as a semitone construction without D.

The succeeding dialogue that develops between the vibrating stream and the newly announced D, emit various kinds of sonic gestures, the details of which cannot be pursued here. However, a few outstanding issues will be addressed. Although D is the point of arrival at the end of frame 1 (before the first pause at the end of bar 10), its neighbouring notes C# and E♭, marked *tenuto,* linger in the background. After the break, the cantabile interjection begins with a mirrored fan-shaped image performed with a short *crescendo* and *decrescendo* and a tripled D at the culmination of the *crescendo*, marked with a *tenuto* sign. The mirrored fan shape evokes the visual image of a circle. The circular effect in bar 11 is varied and extended in bars 12 and 13, while D's colouring notes E♭ and C# (s10 interval) under the *fermata* in bar 11 expand to end on C-D-E (s16 range) in bar 13. Here the image of the circle opens up and D again recedes in the background, when it moves to the middle position between neighbouring notes that are now a whole tone away, that is middle C and E an octave higher. C-D-E is also the final formation of this frame (under the *fermata* in bar 17). It seems as if D is now asserting itself because in the alternation of the two hands at the beginning of frame 3, D is tripled with E♭ and C# below the top D. The improvisatory nature of this frame and the idea of background and foreground as represented by small and big notes *seem to* suggest a freer kind of interaction.[43]

But D seems to disappear in the faster tempo within this penultimate frame of Setude III (marked *Piu mosso* in bar 23), it only appears three times in the *piu mosso* section, doubled, having a non-essential character as ornaments for D♭ / C# and for D# (bar 23^3 and bar 25^3 respectively). At a faster tempo, this music moves toward a point of arrival at the *fermata* (end of bar 26, beginning of bar 27) with the final pitch formation far removed from a solitary D (E♭-B-F-C#), the pitches of the tone cluster played by the left hand at the beginning, but now opened up. However, the final frame, marked *Tempo Primo*, begins with 10 Ds that alternate over two octaves. Although a tripled D as the ending of this setude may suggest the outcome of the dialogue, it may be ambiguous hovering on E♭, the closing gesture takes time to reach the final note. A question mark also lingers in the listener's mind when

the line descends through the semitone, especially since the dynamic level is finally ***pppp***.

The search for musical understanding could also consider the circular figure as vehicle for signification. In *Man and his Symbols* Marie-Louise von Franz describes the circle as a symbol of the self (Jaffé 1964, 240). A similar kind of signification can be found in the dialogue between Aschenbach's rational consciousness and his irrational subconscious in Britten's opera, discussed above – the questions and answers are punctuated by circular figures played by the harp and pianoforte.[44] The idea of a dialogue within Setude III could also be understood as a dialogue within the self, that is, between the rational (as represented by the motoric auditory streaming, marked *senza rubato*) and the imaginative, creative free thinker, as represented by the development of D from mere sparks into the dominating position in the upper register of the final frame. These two moments are separated by a kind of conversation in the improvisatory passages. But the lingering question at the end seems to remain unresolved. Could the shaping of an outer, physical landscape over time then represent an inner, human landscape?[45] The answer may be in the positive if the perceiver experiences music in its temporal manifestation, the flow of the music, because temporality 'is essential to the knowing of being – i.e. consciousness' (D. Clarke 2011, 1).[46]

Multiple sites of meaning could be construed from the musical data presented in this discussion of Setude III. Depending on the subject position, it could include, amongst other things, a political-ideological, cultural or gender-based reading of the musical text. Furthermore, the notion of multiple signification suggests that the debate on the intention of the composer is not crucial when music is considered as an art, because unambiguousness is normally not regarded as characteristic of artistic expression. But all interpretations have one thing in common – they are based on musical data that are generated by the text.[47]

When I started my preparation for this article, I listened to Taljaard's *Setudes* and my first impression was the way in which time and space fuse. As such, the idea of fusing finally ends this essay (at least, that is what I initially intended to do) when the concept of *etude* (viewed as an exercise) fuses with the term *set* as in pitch-class set (an aggregate of pitches) in order to determine how the composer manipulates pitch and various pitch aggregates over time in order to fuse time and space.[48]

Part III: Creating in Space-Time

Taljaard's *Setudes* demonstrate the fusion of ontological time ('real time') and psychological time ('as experienced by humans'; Levidou 2011, 624), when pitch formations are horizontalized and shaped in a temporal manner to demonstrate the becoming of musical structures in space-time. The structuring of vertical space has received ample attention in the past, resulting in, for example, numerous systems of chord classifications. This type of approach can be regarded as the study of the moment, of static structures. But when vertical structures are horizontalized and the music moves through psychological time, when synchronic effects become diachronic flow, it represents a stream of consciousness in temporal space.

The notion of vertical and horizontal space corresponds with Delaere's categories of ontological time (inter alia *temps espace*, *temps structure*, being) and psychological time (inter alia *temps durée*, *durée vécue*, becoming). Ontological time and psychological time are listed under Delaere's 'Philosophical categories'. In his 'categories of time' Delaere (2009, 29) constructs a static-dynamic binary way of thinking, namely self-sufficiency, moment and non-linearity as opposed to development, process and linearity respectively. Based on the model of Pierre Souvtchinsky, who distinguished between psychological and ontological time, Delaere also relied on the ideas of Gianmario Borio, Gisèle Brelet, Henri Bergson and Olivier Messiaen, who emphasised the idea of perception (*durée vécue*) as opposed to *temps structure* (*ibid.*).[49]

But the fact that the starting point of the process of shaping within a temporal frame is a musical

structure of some kind redirects attention, yet again, to musical structure, to the concept of the moment. '[T]he most salient characteristic of musical time, as distinct from ordinary, "psychological" time, is precisely its pronounced spatial – that is, structured – quality. Musical space is the framework within which, and through which, the actual sequence of musical events is shaped.' (Morgan 1980, 529). Despite early endeavours to generate interest in the temporal dimension of music, Delaere maintained in 2009 that 'until recently, independent studies of musical time of comparable scope and depth were underrepresented' when he was comparing studies on music as a temporal art form with 'the far greater portion of the theoretical and analytical literature on art music [which] deals with *pitch independently of temporal factors'* (p. 13, my emphasis).

Igor Stravinsky mentioned the distinction between ontological and psychological time in his *Poetics of Music* (1947) in the second chapter, which deals with the phenomenon of music:

> More complex and really fundamental is the specific problem of musical time, of the *chronos* of music. This problem has recently been made the object of a particularly interesting study by Mr. Pierre Souvtchinsky, a Russian philosopher-friend of mine. His thinking is so closely akin to mine that I can do no better than to summarize his thesis here. Musical creation appears to him an innate complex of intuitions and possibilities based primarily upon an exclusively musical experiencing of time – *chronos*, of which the musical work merely gives us the functional realization. (Souvtchinsky 1947, 29-30)

But in a general sense the nature of the fusion of time and space was explicitly developed in 1915 by Albert Einstein in his theory of relativity. He postulated that space and time are joined to form a united whole, 'the space-time continuum' (Levidou 2011, 623). Three-dimensional space (height, length and depth) was fused with time, the latter consisting of 'the Beginning, the Change and the End' – Ashtekar's (2006, 1) definition of time.[50] What is significant here is that the middle section of this notion of time is not a static and rigid phenomenon; rather, it is elastic and fluid (Ashtekar 2015, 71), which we can relate to the dynamic idea of becoming.[51]

Translating the geometrical notion of space into musical language, height can be compared with the range of a pitch structure or a band of sound (vertical distance between lowest and highest note) and length can be compared with duration, whether of a (sustained) note, a repeated pattern, a sustained vertical pitch construction or of a phrase. But how does one explain the idea of depth in music? The first explanation that comes to mind is one that lies on the surface of the music, namely as represented by the statement 'That man has a deep voice'. But this description seems just too facile to allow for a nuanced description of an important characteristic of musical texture. So, another possibility is to link depth with the thickness of a sound construction or of a band of sound, in other words, whether the texture is porous or dense. A single melodic line would then be regarded as a thin line whereas an eight-part texture, for example, would then be heard as a dense, thick sound effect, regardless of whether the texture is homophonic or polyphonic. Between these two poles there are various possibilities of shaping the soundscape, whether by creating static effects (sustained formations or repeated notes) or as fluctuation between the various thicknesses or densities. This fluctuation could be sudden or gradual, the latter representing the idea of musical flow or of becoming.

When geometric space fuses with time, three-dimensional space becomes a four-dimensional continuum. Similarly, we can refer to space-time as a unit in music because 'pitch and duration are two dimensions of the same phenomenon', the continuum (Delaere 2009, 33). In atonal music a stream or a flow of sound within space-time differs dramatically from the sonic structuring of goal-oriented tonality, where the end of a phrase or the cadence can be anticipated

by the listener. 'Paying due attention to the structured temporality of music ... might help bring a much needed focus to the key dimension of time in the constitution of consciousness' (Clarke and Clarke 2011, xix). How does the composer of *Setudes* shape time and space in the absence of tonal goal-directed processes? After having dealt with the performer's exclusive tactile understanding and the intuitive listening experience, this venture into understanding Taljaard's *Setudes* finally arrives at the question: What does the music say to me on its own terms?

Pitch structure is usually the starting point when analysing a piece of music, but technical knowledge can become part of an artistic enterprise when following the way in which sound is shaped over time to create a certain effect or mood. Taking into account the becoming of an idea within the compositional design as a whole facilitates understanding of the musical message. For example, the open fifths in frame 1 of Setude II, whether appearing as vertical or horizontal structures, emphasized by accents and staccatos, create the impression of a statement being made. The mood is upbeat and affirmative – rests that interrupt patterns enhance this impression. Although frame 2 uses the same pitches, the effect differs from frame 1 because the music becomes flowing with fewer accents and *staccatos*; it creates a stream of thought that becomes, metaphorically speaking, musical poetry. One could say that the statement made in frame 1 is developed in frame 2. The effect of the pattern *statement – development* appears further on in the setude as well. Setude III develops this idea of alternating statement and development, more specifically of a monologue alternating with a dialogue.

Apart from explanations for the title of *Setudes* given above, the term *set* reminds me of sets of pitches or pitch-classes as they are used by musical set theory, more specifically in Allen Forte's *Structure of Atonal Music* (1973). However, my approach towards understanding Taljaard's work for piano does not rely on an analytical system, but takes as point of departure *the music itself*.[52] The strategy followed here is to allow the music to *speak* for itself. So, what does Taljaard's music tell us about musical expression as an art?[53]

Following the same route as with Setude II and Setude III (determining the main sections and then the vertical and horizontal pitch formations that fill the sections over time), it was possible to give a graphic representation of Setude IV (see Figure 2).[54] Breaks in the music that are caused by, for example, a rest or a *fermata* help to demarcate sections. This setude begins and ends with the same pitch structure, a symmetrical tetrachord consisting of a tritone framed by a semitone on each side (D#-E-A#-B in the left hand of bar 1, see Example 3).[55] When the intervals that constitute this formation are expressed in number of semitones, this symmetrical structure can be labelled as s1 6 1. In the climactic conclusion the last three beats of the piece are marked *presto possibile* ***fff*** followed by a *crescendo*. Here s1 6 1 and its symmetrical inversion s1 4 1, alternate with another symmetrical structure, the traditional quartad (D-F-A-C), s3 4 3 and its symmetrical inversion s3 2 3 (A-C-D-F).[56] For the purpose of this discussion the two basic tetrachords will be called T1 and T2 respectively and their inversions will be referred to as t1 and t2 respectively.

The assertive effect of the angular T1 may be ascribed to the tritone that is framed by the clashing effect of the vertical semitones. Its inversion which has s4 as kernel sounds less aggressive. The intervals that constitute T2, namely s3 and s4, both have a mellow effect, comparatively speaking, while inversions of T2 evoke a pentatonic atmosphere. In this setude the deployment of angular and mellow-sounding structures plays an important role, as will be shown below.[57] In the rough representation of Setude IV (see Figure 2) the two types of quartads are respectively represented by red and black colours. In both cases a long vertical strip indicates the basic structure and the short vertical strip inversions of T1 and T2. In exceptional cases when T1 appears in an inversion other than the s1 4 1 formation (e.g. bars 61 and 62), an even shorter red strip is used.

A horizontal arrow indicates that a specific pattern is continued, with or without alterations, and a broken horizontal line represents a flow of music, usually based on material from which it develops. The static effect in subsection z is represented by a dotted line.

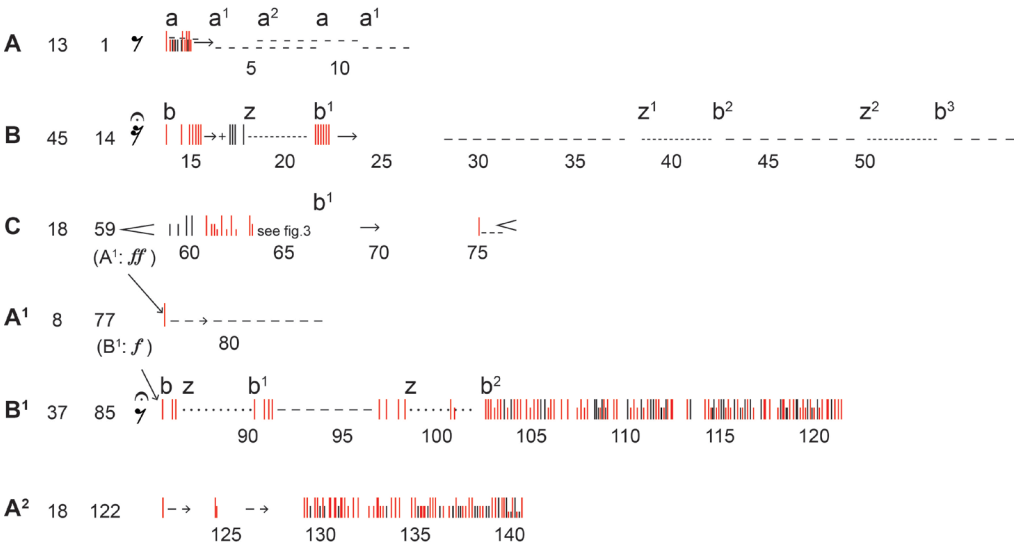


Figure 2: Graphic representation of T1 and T2 in Setude IV.

Key to Figure 2:

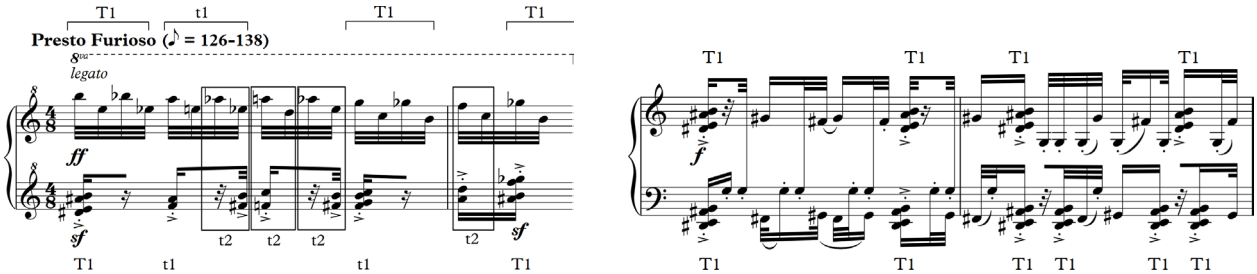
Column 1: Section

Column 2: Number of bars in the section, 1 square represents 1 bar

Column 3: Number of first bar in the section

Column 4: Motivation for demarcation of the section

The two basic structures are introduced in bar 1, where a vertical T1 on the first beat of bar 1 and of bar 2, marked ***sf***, frames the subtle effect of t2 structures. (See Example 3a.) Within this larger frame, t1 also frames the three t2 structures. (In bar 2 a horizontal T1 starts in the middle of the first beat.) Apart from the vertical T1 at the beginning and end of subsection a, played by the left hand, T1 also introduces section B, but now doubled in both hands. Example 3b shows the first two bars of section B. After occurring only three times in subsection a,[58] G plays a prominent role in section B, alternating with octave replaced neighbouring notes to create an effect of stasis. As the absent middle note of the opening T1 in subsection a, G creates another symmetrical formation in subsection b, that is D#-E-(F#)-G-(G#)-A#-B. As in Setude III, where D as the missing note of the opening formation was introduced later to create a dialogue, the persistent, repetitive Gs in Setude IV create a new sonic effect – they halt the initial flow of the music by introducing a general static effect in section B.



Example 3: Setude IV, bar 1-2[1], bar 14.

The idea of alternation (as between T1 and G in the b section) also manifests on a broader scale when subsection b alternates with a subsection marked 'z' in Figure 2 that enhances the effect of stasis. In subsection z the effect of stasis is created when the two hands alternate s10 and s14 intervals in demisemiquavers on the neighbouring notes of G, namely A♭-F# and F#-A♭. G is absent in the first seven beats, but it is introduced systematically in the last seven beats of the z section (bar 20[2]-21).

By just looking at Figure 2, a lot of information about the way in which sound is structured over time is directly visible without having to apply a system of analysis or for the reader to work through complicated analyses. But understanding is only fully realised when *looking* goes hand in hand with *seeing* – when 'to turn your eyes in a particular direction' takes you to the next level, namely, 'to *become aware* of something by using your eyes' (Hornby 2015, 893 and 1355, my emphasis); this is when 'I see' can become 'I understand'. Being aware is defined as 'knowing or realizing something' (*ibid*. p. 88). Awareness, then, can also be regarded as a kind of knowledge. So, by looking at bar 1 of the setude (Figure 2), one can see that T1 frames t2, while at the end of the setude the two types alternate, with T1 dominating in the end. One can also see that the alternation of T1 and T2 dominates the second half of section B[1], with T1 in the prominent position projecting an assertive mood.[59]

But the graphic representation does not reflect the becoming of pitch structures, that is, how the elements of two different formations are deployed horizontally to shape the music over time. The A section is characterized by a flowing line in the right hand of subsection a, which is repeated by the left hand in subsection a[1]. These two subsections as a unit frame the doubled flowing line played by the two hands in subsection a[2] (see Figure 2). The flowing line is created by horizontalized intervals of the T1 and t1, resulting in consecutive open s7 intervals (in the case of s1 6 1) or s5 intervals (in the case of s1 4 1). The effect of flow is emphasized in the centre of section A (subsection a[2]) because of the absence of the rhythmical, accented dyads and tetrachords in the accompaniment that appear in subsections a and a[1] (see Example 3). A vertical T1 appears three times in subsection a: at the beginning, the middle and the end. The top line of the four T1 structures shows an ascending contour, B-C-G♭-G, that is T1 in a horizontal format.

The flowing effect of section A becomes a more static effect in section B and is finally halted by the alternating hands in subsection z. The first subsection of section B, that is subsection b, begins with an articulated alternation of the two hands on ***f*** level (as discussed above). In the last third of this subsection T2 joins the alternation between T1, G and its neighbouring tones. An extended subsection b[1] with its typical rhythmic articulation starts in bar 22, but from bar 28 onwards, marked ***mf*** legato following an emphasized T1 and a break in the music, the emphatic effect gradually dwindles into a flowing style to arrive at the effect of stasis in another z section beginning in bar 39.

In section C the effect of the flowing line that came to a halt in the stasis of subsection z now returns to a mellow effect. This section, marked ***mp*** *meno mosso*,

begins with a vertical whole tone structure with outline E-A# played by the left hand and F# and G# an octave higher by the right hand. The two dyads are exchanged between the two hands in a syncopated rhythm to arrive at a t2 construction of which the dyads are arranged in similar fashion (bar 59[2]). In the following bar (60), T2 with original pitch classes (D-F-A-C) crystallizes, played twice by both hands, the second one by the left hand synchronizing with the first one by the right hand. In the next two bars T1 and t1 return, also using their original pitch classes (D#-E-A#-B and E-F-A-A# respectively), arranged in a frame-like fashion. (See Figure 2.) Four bars of dyad interaction (bars 59 – 62) arrive at a vertical whole tone structure (E-F#-A♭-B♭) with G added at the beginning of bar 63. When looking at the first vertical structure in each of the next 3 x 2 bar sections, one can see that the following six bars produce another frame-like structure – after the whole-tone structure plus G at the beginning of bar 63, the vertical structure expands to include D# and B as the outer borders of this structure in bar 65[1], but they fall away at the beginning of bar 67, closing the frame. Until the end of section C the music develops in a free style based on material from these formations, and in which the syncopated falling s3 interval (introduced as B♭ – G in bar 63[1]) is prominent.

The first vertical structure of the main sections represents a moment in time, but when they are viewed against the work as a whole, they demonstrate the idea of becoming. Figure 3 shows the first vertical structure of the three main sections (also see Example 3) and the systematic way in which it grows into a dense, filled-up structure just before the middle of the setude to return to its original gapped s1 6 1 format at the conclusion. The becoming of the main vertical tetrachord in Setude IV shows how the idea of symmetry on microlevel, as embodied in the main pitch structure, also manifests itself over time to shape the work as a whole.

Section A:	**D♯**	**E**						**A♯**	**B**	**(bar 1[1])**
Section B:	**D♯**	**E**						**A♯**	**B**	**(bar 14[1])**
					G					**(bar 14[1-5])**
				F♯		**G♯**				**(bar 14[2-3])**
	D♯	**E**						**A♯**	**B**	**(bar 14[4])**
Section C:		**E**		**F♯**		**G♯**		**A♯**		**(bar 59[1])**
		E		**F♯**	**G**	**G♯**		**A♯**		**(bar 63[1])**
	D♯	**E**	**F**	**F♯**	**G**	**G♯**	**A**	**A♯**	**B**	**(bar 65[1])**
		E		**F♯**	**G**	**G♯**		**A♯**		**(bar 67[1])**
Section A1:	**D♯**	**E**						**A♯**	**B**	**(bar 77[1])**
Section B1:	**D♯**	**E**						**A♯**	**B**	**(bar 85[1], then variation of bar 14)**
					G					**(bar 85[1-5])**
				F♯		**G♯**				**(bar 85[2])**
	D♯	**E**						**A♯**	**B**	**(bar 85[3])**
Section A2:	**A**	**A♯**						**E**	**F**	**(bar 122[1], horizontal format, then varied)**
Final structure:	**D♯**	**E**						**A♯**	**B**	**(bar 140[2], vertical format)**

Figure 3: Becoming of Main Vertical Tetrachord 1.

The idea of becoming also manifests itself on a dynamic level as well as the way in which the pianist's hands share or alternate material. The flowing line introduced by the right hand in the first two and a half bars (played ***ff*** in subsection a) and its accompaniment is inverted in subsection a^1. In subsection a^2 the two hands unite in a doubling of the flowing main material, followed by a repetition of the procedure followed in subsections a and a^1. The stationary effect of section B, played ***f***, is created by the interaction of the two hands in the repetition of notes, short horizontal patterns and vertical tetrachords. After the more emphatic stationary effect of subsection z (three and a half bars, played ***mp***), alternation and interaction of the two hands become more complex in the extended subsection b^1, subsiding into a dwindling line in which T1 alternates between the two hands, marked *decresc.* ***mp.*** This subsection ends with a combination of two different t1 structures in horizontal format. After another interjection of subsection z^1 (marked ***mp*** in bar 39), a doubled line follows a downward contour ending the subsection with an active alternation between the two hands in the lower register, marked ***mf***, the dynamic level of the ensuing subsection z. A short b^3 section with its static, active interaction of the hands returns to its original *forte* level.

Section C, marked ***mp*** *meno mosso* in bar 59, represents the core of the setude. The hands exchange dyads in a mellow whole-tone soundscape, the interaction being initially synchronized rhythmically. From bar 63 onwards the alternation between dynamic levels of ***ppp*** and ***mp*** creates another kind of static effect in the middle of this setude. The alternating ascending flowing lines at the end of this section, marked *accel.* followed by a *crescendo*, introduce the return of section A on its original ***ff*** level. As in the case of pitch structure, the way in which dynamic levels are manipulated in the shaping of sound in Setude IV shows a kind of progression towards the centre of the work and a return to its original appearance, thereby enhancing the effect of a rounded whole that has been created by the becoming of musical structures.

When looking at the pitch structures at the beginning of the first three setudes, one can see that the way in which the main static structures change in the course of time also represent the idea of becoming. In Setude II the semitone movement of open s7 intervals in a mirrored pattern derives from an s1 6 1 structure – C-B-C combined with E-F-E result in vertical structure E-F-B-C with s8 (E-C) as outline (see Example 1). Setude III begins with two whole-tone structures that alternate between the two hands, but the auditory effect is one of a semitone-filled s8 interval, the outline of the s1 6 1 of Setude II, here B♭-F# but without D. In the opening of Setude IV the parallel open s7 intervals of Setude II are horizontalized to become a flowing line and the disguised whole-tone structures at the beginning of Setude III crystalize at the beginning of the middle section (C) of Setude IV to form distinct whole-tone structures, albeit not on a large scale.

Looking at, or understanding Setude IV, requires one to move back from analytical details in order to view the synthesis of the details in the setude as a whole. What strikes me about the manipulation of time-space is more specifically the phenomenon of frames within frames. The biggest frame is manifested in the overall structure when the opening section A is repeated at the end of the work. Section C with its mellow effect represents the softer core of the work. In the middle of section A the flowing effect of the main material is doubled in subsection a2, softening the emphatic effect of the emphasized structures of the accompaniment in subsections a and a^1 that, as a unit, frame a2.

Delving deeper into the music, beginning with the first bars of the setude, one finds the idea of a frame within a frame in its smallest format – the assertive T1 frames bar 1 and within the bar, t1 again frames three versions of t2 (see Example 3). Even the three versions of t2 show a mini-frame – the pitch classes of the middle one corresponds with the main structure of the final T2 (D-F-A-C in bar 140) and the two t2 structures that frame the middle one correspond with regard to pitch (T2: A♭-B-E♭-F#). Patterns that repeat themselves on smaller scales call to mind the fractal geometry of the Polish-born mathematician Benoit

Mandelbrot.[60] For Mandelbrot the idea of repetition and scaling is of aesthetic significance. 'Fractal patterns repeat themselves at ever-decreasing sizes, like nesting Russian dolls, or as the overall form of a cauliflower is replicated in its smallest florets. Such self-similarity, says Mandelbrot, is as appealing in art as it is a perennial concept in nature' (Steinitz 2003, 274).

After this partial analysis of Setude IV, the question would normally be 'Did the composer plan it this way? Or to rephrase the question in terms of the common cliché: 'Was that the intention of the composer?' For me, this rather naïve question is largely irrelevant from an artistic and interpretive point of view, simply because no text is a closed or autonomous system with a meaning that can be finally (pre) determined or fixed.[61] The focus of interpretation is ultimately on what the perceiver hears and understands. In the case of Taljaard's *Setudes,* following the flow of the music to guide one's understanding, rather than relying only on static or predefined abstract structures, allows the setudes to reveal a highly sophisticated form of artistic expression. Reference to the flow of the music intuitively resonates with the idea of following a line of thought,[62] as has been demonstrated by the way in which the argumentation has developed in this essay – it followed unplanned routes to arrive at a fascinating idea, one that supersedes rationality or the senses.[63]

And finally, how ironic it is that while I wanted to establish that by listening to 'the voice' of the music, our appreciation of music as an art is enhanced, eventually ended up producing exciting links to the natural sciences! This led me into a vast, mystical wilderness, an outcome that links with the metaphorical language in the first sentence of this article. On 15 September 2020 *The Journal of Scientific Exploration* placed Philip Brown's article entitled 'Mysticism and the Fine Structure Constant' online. This article, according to Brown (2020), also demonstrates an interdisciplinary movement away from 'home territory'; he adds that it 'should be read in the context of a non-materialistic or non-naturalistic view of Nature. This would include Carl Jung's idea of the collective unconscious that is responsible for universal cultural images or symbols that he referred to as archetypes' (Brown 2020, 3). Brown quotes from the *Stanford Encyclopaedia of Philosophy*, where a *mystical experience* is defined as 'a (purportedly) super sense-perceptual or sub sense-perceptual experience granting acquaintance of realities or states of affairs that are of a kind not accessible by way of sense perception, somatosensory modalities, or standard introspection' (Brown 2020, 9). This led me to the realisation that the path I chose to follow has no ultimate 'point of arrival' ...

Conclusion and an Afterthought

The music of Hannes Taljaard, more specifically his *Setudes*, set up a train of thought that led to my exploring many unplanned avenues towards understanding music that, for many perceivers, expresses itself in a 'foreign language'. It showed how sensory cognition can provide an additional entry point for understanding and that the familiar seventeenth-century Cartesian dictum *Cogito, ergo sum* is only partially true.

When rereading a final version of this essay, I was struck by the many question marks in the text – it seems to raise more questions than provide answers. Does all this wondering imply uncertainty, or does it point to wonder, to the magic of music? If the latter view is adopted, could it then point to the excitement of discovery when new ways of understanding are investigated? Acquiring new ways of listening enhances one's capacity for understanding a greater variety of artistic expression; it enriches not only mind and soul, it also enhances the capacity for aesthetic experience and enjoyment. But it requires the will to change established attitudes and methodologies, and undertaking deliberate actions to 'remake' a work in new ways to complete the 'magic circle of creation'.

More questions seem to arise as one moves further back from these immediate concerns to look at a bigger picture. When will we proceed beyond the idea that there is only one way of thinking and doing? Do we realize how much we focus on the music of the

past? Do we know how much we miss? Are we willing to think anew about the music of today, to inspire the next generation to think creatively about new ways to access this music? And finally, in spite of numerous projects that use music in the pursuit of laudable objectives, what has happened to understanding music as an aesthetic experience?

Endnotes

[1] The idea of geographical space resonates with *landscape* when the latter is linked metaphorically with musical scholarship – the first sentence in Darla Crispin's *Unfolding Time: Studies in Temporality in Twentieth Century Music*, reads as follows: 'It is not surprising that the landscape of musical scholarship in the early twenty-first century should reflect aspects of "unfinished business" from the twentieth. Perhaps nowhere is this more apparent than in approaches to musical temporality' (Crispin 2009, 7).

[2] In Taljaard's list of compositions the date is given as '2004 – the present'. The various dates mentioned in this article form a historical timeline that represents a narrative of its own.

[3] The order of the tasks mentioned here corresponds with the order in which they are discussed in this essay.

[4] I have never spoken to Hannes Taljaard about his way of thinking and doing when he composed the *Setudes*. What follows in the article is based on my conclusions after listening to and looking at the score.

[5] The term *music perception* as it is used in this article indicates the way in which the listener perceives the music and not what music does in the psyche of the listener.

[6] Dusman is currently Professor of Music and Chair of the Department of Music at University of Maryland, Baltimore County (UMBC). She is also associate editor of *Perspectives of New Music*.

[7] HT: 'Patterns can only play their roles in the structuring of the listener's attention when their characteristics and relationships are clearly manifested (to different degrees of perceptibility) on the sensory level. ... Even complex pitch structures ... can be presented in ways that give the resulting structure clear and multidimensional sensory content.' (I wish to thank Hannes Taljaard for his incisive explanations of the composer's way of thinking; because of length I could not include his full text in the endnotes. His report can be accessed online at https://www.sasrim.ac.za/setudes-composers-comments/.

[8] See Spies 2002, pp. 10-1 for the three stanzas of the monologue.

[9] Although the Greek philosopher Socrates (469–399 BC) 'wrote nothing, his thoughts and way of life had a profound impact on many of his contemporaries, and through Plato's portrayal of him in his early writings, he became a major source of inspiration and ideas for later generations of philosophers' (Kraut 1999, 859).

[10] The same argument applies to converse positions.

[11] Although Dewey's *Art as Experience* (1934) 'first established pragmatist aesthetics on the philosophical map', his reluctance to adopt the term 'pragmatist aesthetics' may be attributed to the fact that 'the pragmatic is closely linked to the practical, precisely the idea against which the aesthetic has, since Kant, been traditionally contrasted and often oppositionally defined as purposeless and disinterested' (Shusterman 2010, 26).

[12] HT: 'It is quite likely, even though my conclusion is the result of reflection rather than of research, that the patterns of a specific composition can "calibrate" the mind of a performer and of a listener. Tentative answers to my own questions about the listening process lead me to formulate hypotheses regarding, for example, the saturation of perceptual categories, and the blurring of borders between perceptual categories – and to test/present the ideas in compositions.'

[13] Theaetetus (c. 417 – 369) was a Greek mathematician who is known for his influence on the development of Greek geometry (Encyclopædia Britannica, 2017). The 'imaginary conversation' is 'supposed to have taken place shortly before the trial and death of Socrates' (Cornford 1935, 17).

[14] HT: 'An important idea that I first came across in the 1990s during a presentation by Wolfgang Rihm in Darmstadt can be summarised as "the form of a composition is the structure of the listener's attention". ... Questions about the listening process, questions flowing from this idea of Rihm's, have accompanied my creative work (and teaching) for almost thirty years.'

[15] HT: 'Embodied cognition is very important in everything that I do, and is a framework according to which I explore the guiding principles of my professional and personal path. ... Creating and presenting works can be considered as knowing in action and are the results of linking physical action with perception in both directions. The setudes, like most of my compositions, can be considered as results of reflections (on sensory experiences) in terms of embodied cognition.'

[16] In the opening paragraph of Taljaard's article entitled 'Interpreting Tonality in Three Compositions for Orchestra' by Peter Klatzow, he refers to Richard Taruskin's comment that 'universal truths ... are practically by definition trivial truths' (Taljaard 2004, 29).

[17] WW: 'Embodied awareness helps the performer to access music that is normally perceived as inaccessible. But this kind of interaction with the music has a strong cognitive bias, especially when a work is not written in the idiomatic idiom of the specific instrument. Knowing in action develops gradually as the performer becomes familiar with the nature of the sound, interacting with the music through tactile experience. In this sense, then, understanding and interpreting also become an etude, a kind of mental exercise.' (I wish to thank Waldo Weyer, Associate Professor of Piano at the North-West University for this point as well as for further comments related to the pianist.)

[18] In this essay embodiment does not include bodily responses (such as beating time or moving to the rhythm of the music) or gestures.

[19] WW: 'The performer's involvement with compositional processes and the listening experience becomes an artistic mediation between composer and listener. Because listening is of such primary importance for the performer, not only in embodiment but also in interpretation, the performer becomes an *active beholder*, he becomes the medium through which the composition is recreated.'

[20] Every performer has his/her individual way of making sense of music, and so the approach discussed here is one such possibility. (I shall never forget renowned piano teacher Adolph Hallis's words when he used to place the score on his lap, saying 'Now let's analyse this'.)

[21] HT: 'When composing, one can create sound patterns and structures that are intentionally rich in perceivable qualities and relationships. An example concerns these spaces within pitch structures in the piano etudes. I had to develop ways to analyse and understand pitch sets as units; also their classes and relations, as well as the transformation that they make possible in sonic space.'

[22] HT: 'Part of my studies here in Vienna is a choreography of Setude III which I have to develop and then present (as movement artist) in March 2021. These projects are bringing fascinating discoveries on how the "embodied mind and fingers" work, and deep reflection on the "meaning" or content of Setude III.'

[23] Setude II is the first in a series of four setudes, numbered consecutively as II, III, IV and VI. In the composer's worklist the entry is followed by '(2004 – present)', indicating that the *Setudes* must be regarded as work in progress. HT: 'I have recently embarked on a project to learn to play the four existing setudes on the piano, as a way to work towards completing the collection of ten setudes that I planned.'

[24] HT: ' All examples that are related to shapes in sonic space show how an awareness of the structuring potential of phenomena allows the synthesis of patterns into temporal structures, in other words, into processes that can be followed and understood by performers and listeners. Opening and closing in sonic space is one example of potential interaction between pitch sets in terms of the spaces between the pitches.'

[25] Taljaard's essay in his final-year Bachelor of Music course dealt with the nature of goal-oriented processes in twentieth-century music (1993).

[26] In this article an interval is labelled according to the number of semitones it consists of, because the use of traditional terminology (major, minor, etc.) implies the presence of tonality. Therefore, an s6 interval is the same as the tritone (the augmented 4th, or the diminished 5th of tonality).

[27] WW: 'Pulsation in time-space is a key aspect of embodiment – more specifically here perceived as regular versus irregular – and also guides the performer in the shaping of the music.'

[28] HT: 'Playing the mirror pitch structures creates a feeling of consonance in the movement of the two hands, and this becomes linked to very specific dyads or interval classes, and pitch/pc sets. When the axis of symmetry is kept for some time, the pitch sets (including dyads) become consonant centres. This auditory-tactile experience is one of the foundations of the setudes.'

[29] WW: 'The auditory phenomena which became meaningful to the performer during preparation for the performance, will guide the listener as the music unfolds in time.'

[30] This essay does not address the issue of emotional responses to music.

[31] HT: 'One way to understand auditory perception involves retention (awareness of the sounds that have just occurred) and protention (awareness of the sounds that are about to occur), as well as primal impression (awareness of sounds in the perceptual present). These three "contents of consciousness" can function also when tonal forces as found in common practice tonality are absent.'

[32] Questions about the nature of musical consciousness, the kinds of musical consciousness, their significance, how they come about, as well as defining the study of music and consciousness were dealt with during the first international conference on *Music and Consciousness* that took place in 2006 (Clarke and Clarke 2011, xx).

[33] Kandel (1929-2019), who worked in the field of neuroscience and psychoanalysis, published his *The Age of Insight: The Quest to Understand the Unconscious in Art, Mind and Brain, from Vienna 1900 to the Present* in 2012.

[34] 24 melodies for piano were used in the experiment, of which three were shown without titles in the article, namely the main theme from *Eine kleine Nachtmusik* (Mozart) (*sic.*), *Musette* by Bach and *The Happy Farmer* by Schumann (Haueisen and Knösche 2001, 790).

[35] Jauss (1967) introduced reception theory in his inaugural lecture at the University of Constance. It is entitled *Literary History as a Challenge to Literary Theory*.

[36] Iser first presented his theories of reader response in a lecture of 1970, followed by two major books entitled *The Implied Reader* (1974) and *The Act of Reading* (1976).

[37] I wish to thank Heilna du Plooy, Extraordinary Professor in the Research Unit *Languages and Literature* at the North-West University, for drawing my attention to the role of Jauss and Iser in establishing reception theory.

[38] 'Das Entscheidene bei einer kompositorisch-gedanklichen Konstruktion ist, inwieweit sie sich unmittelbar auf der sinnlich-musikalischen Ebene manifestieren kann.'

[39] Lawrence Zbikowski (2011, 190) argues that 'the kind of consciousness associated with attending to music is different from the kind of consciousness associated with attending to language'.

[40] 'It seems like traditional pedagogy (at least in North America) is in such a hurry to wring the roman numeral out of the music that students are rewarded for ignoring other (and to my mind equally) crucial aspects of the music. We spend a lot of time just listening and pointing out often obvious features of the music – dynamics, texture, etc., all of which are on your list. So often the most interesting aspects of music are the obvious ones, the ones that tend to go without saying, but never should' (Hyer, 1998). Brian Hyer is Professor of Music Theory at the University of Wisconsin-Madison.

[41] This is not the place to attend to the complex issue of syntax and semantics in the study of music theory. Suffice it to say here that systematized theoretical knowledge alone does not provide a sufficient basis for a comprehensive understanding of music. (Compared to the study of language, one might ask what the purpose is of understanding grammar without understanding the meaning of a sentence.)

[42] See Example 2 and listen to the performance at https://youtu.be/9z6cya-Plzw.

[43] WW: 'This situation is a very good example of the divergent roles of the listener and the performer. The listener may experience the effect of the dialogue as being more free than the preceding mechanical interaction between the two hands, but the performer has to work very hard, thus being less free to interpret the musical score, in order to create this effect of a more relaxed interaction between foreground and background.'

[44] The various sustained intervals played by the strings at the end of phrases in Aschenbach's monologue create a kind of progression that reflects his stream of thought (see Spies 2002, 10-1). Listen at https://youtu.be/HgNvRZbvi1k?t=7152 to this monologue from *Death in Venice*.

[45] WW: 'This notion definitely resonates with me as performer. Getting to know a score, the process towards interpretation involves a search for the conversations that are within the music, but as performer you also step into these conversations. You identify statements, find the comments and questions, try to provide answers, and see the resolutions at first not perceptible. Finally, during the ultimate interpretation on stage the music is part of you, I guess, again embodiment.'

[46] HT: 'Setude III is indeed the most introvert of the four setudes. ... While working here in Vienna on the choreography under the guidance of experienced artists, the aspect of inwardness, dialogue and contained tension often enters the discussions'.

[47] To what extent has the voice of the music been suppressed when the musical product is used to validate the subject position, be it to demonstrate an analytical system (I include myself here) or substantiate, for example, the subject's politic-ideological preferences?

[48] The term *set* reminds me of Taljaard's mini-dissertation for his Honours degree entitled *Die terugsporing van sleutelkonsepte in die evaluering van Allen Forte se benadering tot die setteorie / Tracing of Key Concepts in the Evaluation of Allen Forte's Approach to Set Theory* (1994).

[49] Pierre Souvtchinsky is the name by which the Russian Petr Suvchinskii (1892-1985) is known in the Western world.

[50] Abhay Ashtekar is Professor of Physics and the Director of the Institute for Gravitational Physics and Geometry at Pennsylvania State University. He is the editor of *100 Years of Relativity. Space-time Structure: Einstein and Beyond* (Ashtekar, 2005).

[51] I thank Philip Brown, Associate Professor of Mathematics at Texas A&M University at Galveston (USA) for his assistance with regard to issues that deal with geometry and physics.

[52] The expression 'the music itself' with its controversial connotations could be avoided until now, but the voice of the music can no longer be ignored. On the other hand, if I had been a composer, I am not sure whether I would have appreciated it if another person clinically dissects my artistic efforts.

[53] HT: 'In the composition process this centred on the effects of sensory content on the awareness of the embodied experiences of perceivers.'

[54] The score can be obtained by sending a request to the composer at <hannestaljaard3@gmail.com>.

[55] This article acknowledges enharmonic equivalents because the mode of expression in Taljaard's *Setudes* is atonal.

[56] HT: 'These two pc sets and their relationships proved to be very rich in possibilities for composition, and they are also proving their value in my current studies of musical improvisation. ... To some extent the setudes can be considered as studies in symmetry and the destruction of symmetry. I tried to avoid the deadly curse of absolute symmetry, while exploiting as much of the potential of symmetry as possible.'

[57] HT: 'Many contrast pairs (such as wide-narrow, static-dynamic, or tension and release that are possible because of the relationship between T1/t1 and T2/t2) can be explored and presented through patterns that are independent of the constraints of common practice tonality. These contrast pairs play very important roles in performing and listening experiences of tonal music, of course. Our incomplete views may be the result of reductionist music theory practices that cloud our perception and understanding.'

[58] G is doubled in bar 1^4 in a passing formation and it constitutes the top note of T1 as the point of arrival in the left hand.

[59] HT: 'The composition can do its work in and with the consciousness of the listener when the composer presents at least some phenomena that lie within the realm of that which is possible for the listener to grasp. Then this "minimum" content of conscious experience can become the seed from which an understanding of the composition grows, a process that you describe in this article.'

[60] Mandelbrot's *The Fractal Geometry of Nature* appeared in 1982. In 1996 Ligeti and Mandelbrot between them gave four lectures at a conference with the double title of 'Fractals and Music' and 'Music and Mathematics'. Ligeti's first choice as a career was physics and mathematics (Steinitz 2003, 274, 17).

[61] The article entitled 'Atonality, Analysis, and the Intentional Fallacy' by Ethan Haimo (1996) and Edward Latham's response to this article (1997) represent some problematic aspects of this issue.

[62] In her essay entitled 'Taking a line for a walk: an iconic and intertextual reading of T.T. Cloete's "toepassings van dante" ("applications of dante")' Heilna du Plooy (2008, 1) shows that '[l]ine, movement and form are depicted as dynamic aspects of creativity but ultimately the paradoxical relation between beauty and functionality is thematised'.

[63] In a certain sense the combination of rationality and the senses can be regarded as a metaphor for the idea of musical structure as a static concept and the phenomenon of becoming within the listener's aesthetic experience.

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