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## PERFORMING TEMPORAL PROCESSES

**Abstract:** This article explores the way that the performance of temporal processes in recent contemporary music reveals something about the nature of musical time. Process music deals with time as a part of its material, offering the opportunity to experience time *as* time: the expression and experience of units of time that are defined by, and enclose, processes, in works whose forms are defined by their durations. This experience of musical time has been described by Kramer as ‘vertical time’ (1981/1988): the extended perception of a single moment. Such an experience can be identified in Gisby’s *Iterative Music* (2012–) and Zaldua’s *Foreign Languages* (2013–17). The moment-to-moment sonic details of the works are undefined and are discoverable only as they unfold, highlighting the unpredictability of sometimes highly prescriptive music.

Bergson’s (1889;1910) *Time and Free Will* outlines the distinction between time as units of duration and ‘real duration’, which is the experience of time passing in the present. In the latter case “several conscious states are organised into a whole, permeate one another,

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gradually gain a richer content” (1910, 122). The duration of Spahlinger’s *Eigenzeit* from *Vorsläge* (1992–93) is determined by its processes, which are undetermined until they are enacted. Stone furthers this in *As sure as time...* (2016–) by imagining each performance as a unit of duration in a theoretical meta-performance. These pieces show how the performance of temporal process makes concrete the quantitative nature of duration and shifts the focus of the listener to vertical time.

**Key words:** time, performance, process, Bergson, Kramer.

The concurrent experience of time and music is a complex one. There are numerous musical indicators of time passing in music – metric and individual durations, tempo indications, sections, movements, and other divisions of works – but these really only describe a musical construct of time passing within the music. The experience of music passing *in time* is one that seems to be both separate from musical divisions of time, or every-day divisions of time (seconds, minutes, hours, etc.), and variable: a long piece may seem to pass very quickly, while a shorter one much more slowly. ‘Time’, therefore, seems to designate several concurrent aspects of experience and duration when applied to music.

Process music offers particular opportunities to consider time and its experience, since the processes of process music often invite the listener’s consideration of clearly demarcated durations. In addition, the experience of these durations might often be at odds with the experience of the duration of the whole piece. Three of Steve Reich’s examples of such processes in the essay “Music as a Gradual Process” detail processes that are made up of small and regular durations, are clearly time-bounded, and yet are not definable in time until after they have passed:

pulling back a swing, releasing it, and observing it gradually come to rest; turning over an hour glass and watching the sand slowly run through to the bottom; placing your feet in the sand by the ocean’s edge and watching, feeling, and listening to the waves gradually bury them.<sup>1</sup>

In Reich’s assessment, processes “determine all the note-to-note details and the overall form simultaneously”,<sup>2</sup> but the macro-durations of the examples above are not necessarily experienced simply as an accumulation of the micro-durations into which these processes can be divided. As a result of this observation, it is possible to state that all process music deals with time on multiple levels of its material. The experience of time in process music can be the experience of

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<sup>1</sup> Steve Reich, “Music as a Gradual Process”, in: *Writings on Music 1965–2000*, Steve Reich and Paul Hillier (Eds.), Oxford, Oxford University Press, 2004, 34–36; 34.

<sup>2</sup> *Ibid.*, 36.

time itself, rather than of time passing or of divided time. Where many musical works offer an experience of time as an experience of change or development, process works offer the opportunity to experience time *as* time. That is to say, these works offer the expression and experience of units of time that are defined by, and enclose, processes. Where the duration of a non-process work might be defined by its form, here the work's form is defined by its duration.

This experience of musical time has been described by Jonathan Kramer as 'vertical time':<sup>3</sup> the extended perception of a single moment. In Kramer's construction, time is passing for the listener, but experience is not. This is a feature of post-tonal musics. The predictability and direction of tonality means that linear time in such works is defined by their tonal narrative, or "horizontal time",<sup>4</sup> something that, for Kramer, has "lost its universality".<sup>5</sup> In contrast, "vertical time" is an experiential definition of time: it is a listening experience rather than a non-linear temporal dimension. In this case, the moment-to-moment sonic details of works that allow for this experience remain undefined and are discoverable only as they unfold in performance. As such, "vertical time" expresses time in music as a dimension of music's performative experience and not simply its form.

Henri Bergson's *Time and Free Will*<sup>6</sup> outlines the distinction between a "scientific" understanding of time – as units of duration understood as a spatial metaphor – and "real duration" which is the experience of time passing in the present. This is expressed as a differentiation between a quantitative and a qualitative multiplicity. In the latter case "several conscious states are organised into a whole, permeate one another, gradually gain a richer content".<sup>7</sup> By enacting "scientific" processes of spatial duration in their approach to time in their works, composers may conversely allow the experience of "real duration" through the reification of the quantitative multiplicity of time on the surface of their music. In such cases, processes that are clearly bounded by time cannot be experienced as a unit of time until they are complete. This opens up a dialectic between qualitative duration – experienced during the performance – and quantitative duration, experienced immediately after the completion of the work's process. In

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<sup>3</sup> Jonathan D. Kramer, "New Temporalities in Music", *Critical Inquiry*, Vol. 7, No. 3, (Spring, 1981), 539–556 and Jonathan D. Kramer, *The Time of Music: New meanings, new temporalities, new listening strategies*, New York, Schirmer Books, 1988.

<sup>4</sup> E.g., Jonathan D. Kramer, *The Time of Music: New meanings, new temporalities, new listening strategies*, op. cit., 13.

<sup>5</sup> Jonathan D. Kramer, "New Temporalities in Music", op. cit., 541.

<sup>6</sup> Henri Bergson, *Time and Free Will: An Essay on the Immediate Data of Consciousness*, (transl. F. L. Pogson), London, George Allen & Unwin, 1889; 1950.

<sup>7</sup> *Ibid.*, 122.

such cases, the performance of a temporal process ‘un-mixes’ space and time through making concrete the quantitative nature of units of duration and shifting the focus of the listener to an experience of vertical time.

This article offers four examples of such cases in recent music: Alistair Zaldua’s *foreign languages* (2013–17), Mathias Spahlinger’s *Eigenzeit* from *vorläge* (1993–4), Steve Gisby’s *Iterative Music* (2014–) project, and Sophie Stone’s *As sure as time...* (2016–). Each piece is outlined in terms of its musical processes and its relationship to time and the experience of time. These four examples comprise work involving soloists, ensembles, electronics, acoustic instruments, live, and recorded performances. In two cases, they represent series that are incomplete and can, perhaps, never be complete. Despite these differences, however, they offer a clear picture of the ways that a processual experience of time in music might add to a general consideration and conception of musical time itself.

*foreign languages* (2013/2017) by Alistair Zaldua is the first of these examples. It was inspired by Maurice Blanchot’s short novel in two cryptically related parts, *Death Sentence*,<sup>8</sup> and Jacques Derrida’s commentary on the same text. This work foregrounds the problem of translation in a work for percussion, focusing on the idea that, more than those for any other instrument, percussion pieces define their cumulative ‘instrument’ anew with almost every piece.<sup>9</sup> *foreign languages* is an open cycle of pieces for solo percussion that thematise translation as a compositional and enacted process. Here, the discussion focuses on a part of the work for solo cymbal and live electronics, where the choice of cymbal is open to the performer. The task of the performer is to activate different harmonics of the cymbal by damping different regions while playing; the rhythm of the performance is determined by the performer reading through a small set of sentences derived from Blanchot’s *L’arrêt de Mort*,<sup>10</sup> and its translation in English, *Death Sentence*.

In the initial (2013) score of *foreign languages* this movement is a single page where a large circle (representing the cymbal) has 3 main starting positions (middle, half-way, and edge), notated as small circles (see figure 1). In addition 15 ‘directions’ are notated as lines with arrows, indicating the percussionist to follow the direction of their beater across the surface of the cymbal. On the right-hand side of the page there are 14 sentences in English, and 18 in French,

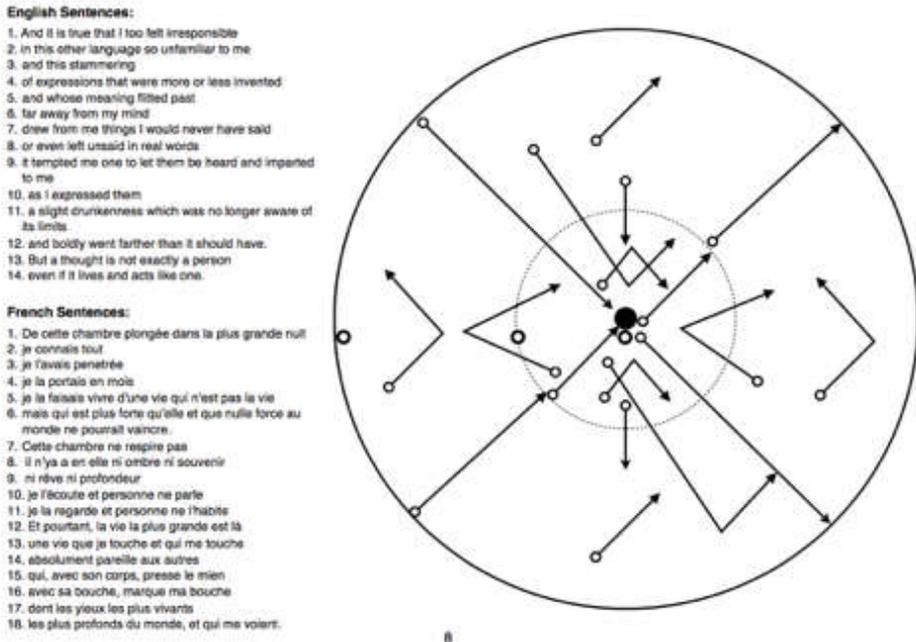
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<sup>8</sup> Maurice Blanchot, *Death Sentence*, (transl. Lydia Davis), New York, Station Hill, 1998.

<sup>9</sup> Zaldua’s earlier piece for percussion is available online at the official New Sound YouTube channel. Please find the playlist here: [https://www.youtube.com/watch?v=GZt\\_2SKut-BY&list=PLNFGwrMs0-Xzo9GYGsuBaxxOc6704\\_IUJ](https://www.youtube.com/watch?v=GZt_2SKut-BY&list=PLNFGwrMs0-Xzo9GYGsuBaxxOc6704_IUJ)

<sup>10</sup> Maurice Blanchot, *L’arrêt de mort*, Paris, Editions Gallimard, 1948.

all of which are taken from the Blanchot text. In performance the percussionist couples a freely chosen sentence from either the French or the English list, and couples this with one of the directions on the cymbal. The rhythm the percussionist plays, which articulates the direction of the beater across the cymbal is the speech-rhythm of the sentences. Furthermore, harmonics are heard while the percussionist places a beaker near to the cymbal without touching it.



**Figure 1:** Notation of the cymbal part, from the 2013 score version of *foreign languages*

In the more recent (2017) version of the piece, a Max/MSP patch acts as an interface between the percussionist and the loudspeakers. The patch records the sound of the cymbal live, analyses the sound via a spectral Fast Fourier Transform (or FFT) analyser, tracks pitches from the cymbal, measures the intervals between each attack of the beater on the cymbal, and plays back frequencies and altered spectra of the cymbal dependent upon the tracked patterns from the attack intervals. The MaxMSP patch is programmed to learn which frequencies are more common than others, and progresses from there, allowing flexibility in performance.

Two aspects of the experience of time in this performance are of interest. First, both duration and rhythm are linked to the embodied experience of the performer of the piece. This is related to their performance with the cymbal, and

their internal speaking of the French and English sentences which determine the rhythm of their playing, and the duration of each of their actions. This is necessarily indeterminate, varying from player to player. But the notation of these durations is fixed, in that they are realised as a result of the same method each time, an example of Bergson's "spatial duration". As such, each of them is also fixed in advance, but the experience of their total duration is only revealed in the moment of performance. As such, these durations are unitary in their composition and notation, but in their performance they become Bergson's "qualitative multiplicity".

This comparative experience of quantitative and qualitative multiplicity is also revealed in *Eigenzeit*, the earliest of the examples in this article. *Eigenzeit* is from a set of pieces by Mathias Spahlinger titled *Vorschläge* (suggestions).<sup>11</sup> The *Vorschläge* are a set of 28 unnumbered text or concept pieces. They consist of different musical and socially communicative ideas and processes. These are often rules, or performance instructions, that yield specific structures as a form of emergent music. The piece's subtitle, *Konzepte zur Ver(über)flüssigung der Funktion des Komponisten*, indicates Spahlinger's intention for the works: it can be translated as "concepts to blur/make superfluous the role of the composer". In German, the word "Vorschlag" means "grace note" as well as suggestion. In the foreword to the score, Spahlinger describes grace notes appearing before their main notes, in a similar way to subsidiary thought processes that precede a main idea.<sup>12</sup>

Spahlinger implies that both can be considered equally and with this collection the often undisputed hierarchy between composer and performer is placed in question.

Mathias Spahlinger is one of a group of German composers (including Helmut Lachenmann, Nicolaus A Huber, Gerhard Stäbler, and others) associated with the political avant-garde in New Music after 1968. Their approach has become known in Germany and elsewhere as "Critical Composition". Nicolaus A. Huber argues that the very word "critical" is determined by historical conditions, "in which only a certain behaviour can be seen as critical".<sup>13</sup> Critical

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<sup>11</sup> Three pieces from the *Vorschläge* (i. *Irreversible*, ii. *Internal clock*, iii. *Kairos*) are available online at the official New Sound YouTube channel. Please find the playlist here: [https://www.youtube.com/watch?v=GZt\\_2SKutBY&list=PLNFGwrMs0-Xzo9GYGsuB-axxOc6704\\_IUJ](https://www.youtube.com/watch?v=GZt_2SKutBY&list=PLNFGwrMs0-Xzo9GYGsuB-axxOc6704_IUJ)

<sup>12</sup> Mathias Spahlinger, "Foreword", in: *Vorschläge: Konzepte zur Ver(über)flüssigung der Funktion des Komponisten*, Rote Reihe, Vienna, Universal Edition, 1993, UE 20070, 5.

<sup>13</sup> Nicholas A Huber, "Critical Composition", in: *Contemporary Music Review*, Vol. 27, No. 6 (2008), 565–568; 565.

composition is not about varying and permutating already-known ideas; instead, it involves a degree of analysis, as a form of pre-compositional work, to inform one's own composition to help reveal something about music itself: "New music says something *about* music. However that only makes sense if it says something about human nature as well."<sup>14</sup> Huber argues that human practice is the point of departure for any artistic activity. If one's thinking is too abstract and divorced from experienced reality, one runs the danger of producing arbitrary results. In unearthing the connections between music and human practice, composition becomes a central communal concern and potentially reveals the degree of responsibility the composer has to humanity. Spahlinger's *Vorschläge* provides a clear example of this and makes an essential contribution to the symbiotic relationships within social and musical activity.

The *Vorschläge* were published by Universal Edition under the Rote Reihe collection, which is dedicated to contemporary music for schools or for group performance. The pieces are important as pedagogical exercises, as they demand little or no instrumental ability, and can be performed by both professional and amateur musicians. As the experiences of the teachers and pupils of the Leininger Gymnasium in Grünstadt, Germany (who commissioned this work and to whom it is dedicated), and elsewhere attest, this collection invites performers to not only understand and execute the instructions of these pieces but to engage critically and creatively. The instructions to one of these pieces, *Eigenzeit*, read:

[find or invent possible objects or performance methods that are barely modifiable regarding their tempo, rhythm, and total duration, which, once they have begun, cannot be further influenced, and which in their process cannot be reversed.

examples and suggestions: circling plates and cymbals, falling ping-pong balls, quickly released car-springs, buzzing/snapping ruler held over a table-edge, marbles thrown down marble lanes, rubber balls thrown down the stairs, etc.

each player decides by themselves when to play, and how they 'stage' their unique, and unmistakable sounds, bearing in mind their approximate duration. frequent accumulation of density and vain repetitions are to be avoided.]<sup>15</sup>

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<sup>14</sup> Ibid.

<sup>15</sup> "finde oder erfinde gegenstände oder spielarten, die in tempo, rhythmus und dauer kaum modifizierbar, möglicherweise nach dem start nicht mehr beeinflussbar, in ihrem ablauf nicht umkehrbar sind. beispiele und anregung: kreisende teller und becken, fallende ping-pong-bälle, wippende riesen-federn, schnarrende lineale über tischkante, murmeln auf murmelnbahn, gummiball treppab etc. jeder bestimmt den einsetzzeitpunkt und die dauer ihrer/seiner einmaligen und unverwechselbaren klänge selbst, d.h. sie/er wartet den selbstinszenatorisch günstigen zeitpunkt ab. so sind zu häufige große dichte und eitle repetitionen zu vermeiden." Mathias Spahlinger, op. cit., 11 (English transl. Alistair Zaldua).

Although it is clear what the performers should do, the amount of work needed to perform this convincingly and responsibly is not initially apparent. In practice the pieces demand a high degree of alertness and focus in their interpreters. Although the exact durations of sound are determined by the natural sonic morphologies of each chosen sound, neither the sequence in which each sound is heard, nor the dramatic structure of the whole, or the unique staging and framing of these sounds are defined by the text. The performers of these pieces engage in practicing making aesthetic choices and thereby train and improve aesthetic judgement. The rules of these pieces need not be understood as being too strict, since they “can be influenced, are changeable, and can even be removed”;<sup>16</sup> in practice, “it will be seen that a rule that is broken on purpose brings more truth to light than a singular rule ever will”.<sup>17</sup> This comment from the foreword means that the request to avoid “frequent accumulation of density and vain repetitions” given at the end of *Eigenzeit*, can be broken, even if only momentarily, if the experiences and discussion that emerge contradict and question the necessity of this rule.

In practice, then, *Eigenzeit* invites the listener to consider a multitude of durations that are individually chosen and composed by its performers. Each duration is experienced as an individual, and therefore distinct, unit. These sounds-as-durations are therefore also *quantitative*. Bergson notes that the quality of sound heard already becomes quantitative in the mind of the listener since, “this quality is immediately interpreted as quantity because you have obtained it yourself a thousand times...the idea this effort immediately comes into your mind when you transform the intensity of the sound into a magnitude”.<sup>18</sup> The every-day nature of the sounds intended by Spahlinger in *Eigenzeit* contribute to this perception: they invite immediate identification by their listeners and call to mind embodied memories that allow them to be experienced as quantity. Yet, as they interact and overlap, they also take on the properties of Bergson’s qualitative multiplicity: whilst the individual units of duration are determined as single actions, the musical duration of the piece becomes a “qualitative multiplicity” in which “several conscious states are organised into a whole, permeate one another”.

In contrast, Steve Gisby’s *Iterative Music* project also relies on individual and distinct units of duration but these are immediately comparable and regularised and thus offer a different experience of musical quantity. *Iterative Music* is an ongoing project that Gisby has been working on since 2012, comprising elec-

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<sup>16</sup> Ibid., 5.

<sup>17</sup> Ibid.

<sup>18</sup> Henri Bergson, op. cit., 43–44.

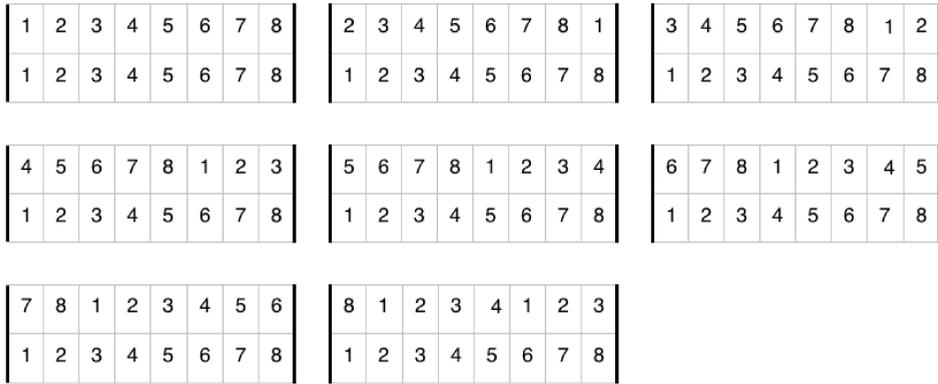
tronic compositions, live performance and a web-based interface. The concepts behind the project explore ideas in relation to mathematical processes, indeterminacy, vertical and horizontal time, and the balance between subjectivity and objectivity. The compositions are created using one of a number of simple processes that involves dividing, looping, manipulating and superimposing layers of audio material. The processes are built solely on pre-defined units of duration, which are then replicated to form the basis of a series of pieces, each one structurally identical yet using different material. To date, the material used in these pieces has been either field recordings or electronically created.

The creation of each piece begins with selecting a number of segments of audio material, usually no more than five, with each one being the same duration (in the region of six seconds). Using the DAW Logic Pro, these segments are then turned into loops and run through one of a number of mathematical processes. The second process in the *Iterative Music* series, which has been the basis of the most recent pieces, divides each loop into eight equal cells, as shown in figure 2. Eight permutations of this loop are thus created, with the cells being displaced one step to the left each time. The process is complete when the cells have returned to their original positions.

1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	1
3	4	5	6	7	8	1	2
4	5	6	7	8	1	2	3
5	6	7	8	1	2	3	4
6	7	8	1	2	3	4	5
7	8	1	2	3	4	5	6
8	1	2	4	3	4	5	7

**Figure 2:** The division and rearrangement of loops in the second process of the *Iterative Music* project.

When superimposed with an identical process, there are eight composite patterns, as shown in figure 3. The same composites, on a cellular level, are arrived at irrespective of which layer moves and whether it moves left or right. As further layers are added, the number of potential composites increases exponentially.



**Figure 3:** The eight composite patterns derived from the second process of the *Iterative Music* project.

The performance of *Iterative Music* juxtaposes the mathematical rigour of the process with an indeterminate approach to repetition. Each layer of audio material is allocated to a separate channel in the software Ableton Live, with each loop as a separate clip. In Ableton Live, these clips are then set to “Trigger” in the Launch Mode, looping continuously until cued by the start of the subsequent one. This allows Gisby the freedom to progress through the process at a speed of his own choosing, effectively introducing a layer of indeterminacy into the music.

The audio material used for *Iterative Music* pieces consciously offers nothing, in terms of the individual layers, by way of a harmonic or rhythmic narrative. Thus, the concept falls outside Kramer’s definition of “horizontal” time. However, the mathematical structure is entirely linear and may, to a certain degree at a given moment, result in an audibly predictable change. Given the use of repetition, and the fact that the process evolves by gradually displacing existing material, there is a sense of continuity from one loop to the next. It is also entirely possible that a sense of directionality may be established as a result of multiple layers of material being superimposed.

In *Iterative Music*, the mathematical processes proceed irrespective of the content of the audio material. No consideration is given to the impact that the move to the next loop will have on the overall music. This aligns with Kramer’s

“vertical time”, as the piece can only be experienced as a result of the process unfolding. It is in order to take advantage of unforeseen moments that, in live performance, Gisby retains the freedom to vary the number of repetitions of a given loop: if it catches his imagination, he may stay with it for a while; if it doesn’t, he has the freedom to move on. The issues of predictability, perceptibility and indeterminate repetition are hereby explored: even if the listener is cognisant of the process of the piece, and even if they can conceive of what the subsequent loop will sound like, they still have no idea of when it will be triggered.

These issues of perceptibility and indeterminate repetition are further explored in Sophie Stone’s work, *As sure as time...* (2016–). This work is an ongoing series; a part of Stone’s Ph.D project that aims to gain new perspectives on compositional strategies, performance situations, and the use of silence, in experimental extended duration music. The series comprises one score which is based on a quote from Harper Lee’s *Go Set a Watchman* (2015): “As sure as time, history is repeating itself, and as sure as man is man, history is the last place he’ll look for his lesson”.<sup>19</sup> The score contains a list of instructions and a table of suggested techniques for structure (e.g. repeating a section, returning to the beginning of a section), spoken voice and sound techniques (e.g. whisper, stamp, silence), and movement (e.g. to move around the audience) that apply to each individual performance ‘event’ that makes up the series. The instructions are:

- Each event should have a minimum of two voices.
- An event should explore different types of performance situations, e.g. concert hall, audience interaction, installation.
- The quote must be split into four sections: “As sure as time”, “history is repeating itself”, “and as sure as man is man”, “history is the last place he’ll look for his lesson”.
- Using the table of techniques as a guide, the vocalists should create a shared performing score [an example is given in the score] that gives differing indeterminate instructions for each section (e.g. what can be or must/must not be included). Although the instructions are predetermined, the nature of these instructions allow for performer choice and interpretation.
- Performer one must start first and on the first section.
- Each remaining performer can start at any time after the first performer, but on any other section.
- Each performer must spend a minimum of two minutes on each section, and must perform the sections in the correct order (unless instructed otherwise).

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<sup>19</sup> Harper Lee, *Go Set a Watchman*, London, William Heinemann, 2015, 197.

- Each performer may finish when they are on the final section (unless instructed otherwise).
- The event ends when every performer has finished.<sup>20</sup>

Each event results in multiple and simultaneous solo performances of different durations. As each event uses the same indeterminate score, each realisation is varied in duration, the number of performers, the performance situation, techniques, and the relationships between sound, movement and the listener, for example. In addition, a new performing score becomes the product of each event.

The quotation that forms the material of the work was chosen for its various possible interpretations and its durational references. *As sure as time...* focuses on different concepts of duration, with the series being its meta-performance and therefore an extended duration work. This idea is predicated on music by many composers, in particular from the Wandelweiser group, for example Carlo Inderhees and Christoph Nicolaus's *3 Jahre – 156 musikalische Ereignisse – 1 Skulptur* (1997–1999).<sup>21</sup> However, Stone takes this practice further by using one score, irregular intervals of sound and silence, and further units of duration. The series comprises several performance events separated by silences (or non-performative events). Furthermore, the performance events contain multiple and simultaneous performances of different lengths, as a result of the decisions made by each performer (e.g. time spent on each section, choice of technique and structural elements, etc.).

This type of work presents questions about the experience of sound and duration. One might ask who experiences the silences (non-performative events) between events, and if it is important for a listener to experience the series in its entirety. Only those aware of the concept of the work, and who have attended any events, will know they are experiencing it: the composer, performers and audience members. For the composer, it is important for the listener to experience the series' absence of sound, but not necessarily through the attendance of every event. The absence of sound within a singular performance event can be experienced through fixed media elements of performance, and the realisation of the music's preparation and compositional processes. Fixed media have been used in several performances and this involves audio recordings of the preparation and composition processes, previous performance events, and other non-performance events that occurred between sound events.

In this series, then, performance and non-performance are not distinct in their aesthetic quality, and the experience of time passing during the perfor-

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<sup>20</sup> Sophie Stone, *As sure as time...*, (2016–), [unpublished].

<sup>21</sup> M.J. Grant, "Series and Place", in: *Contemporary Music Review*, 'Wandelweiser', Special Issue, Vol. 30, No. 6 (2011), 528–531.

mance events is equated with the passage of time between them. The process and experience of the piece is circular and continuous, with no start or end. It is during the event that individuals start to experience the work and the number of events that are attended will affect the character of an individual's experience of the piece. The circular process of the series is delineated by the continued experience of the listener through non-performance and performance events, whether or not they are continually aware of the work as a part of these experiences.

The creation of the series is an iterative process of performance and development with previous events influencing the next as well as the score. An example is the fourth event held at *Performing Indeterminacy: An International Conference*,<sup>22</sup> on Saturday 1<sup>st</sup> July 2017 at the University of Leeds. The compositional process of the new performing score became part of the event as Stone made field recordings of events during this process and included these within the installation. Within this type of realisation there is a contrast between fixed time (fixed media) and unfixed time (the performance event). In this case, fixed time brings the compositional process of a non-performative event into the unfixed sound event. Although a performance event could be described as fixed after it has occurred, in this case it is only ever fixed in the documentation of recordings as each event informs and influences the next.

Each of these examples offers a different experience of time, yet each also offers an experience where a “quantitative multiplicity” can be identified as a retrospective result of the process of the music. In each case, then, the experience of duration is in some way foregrounded, be it the experience of a single looping fragment as in Gisby's work, an embodied process as in Zaldua's and Spahlinger's pieces, or of the performance event as a unit of duration in Stone's music. Further to this thought, this music offers the experience of unitary duration for contrast with the concurrent experience of time as a “qualitative multiplicity”.

As a result of the presentation of these concurrent experiences of time, these examples show how process music offers a different approach to the experience of musical time itself. Kramer equates the move away from horizontal time with the departure from tonality as a dominant method of structuring musical composition. Post tonal musics, for Kramer, offer an experience of time that is closer to the “internal temporal processes” of its listeners.<sup>23</sup> This seems to agree with Bergson's statement that, “time does not require to be seen, but to be lived”.<sup>24</sup> In

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<sup>22</sup> Sophie Stone, “As sure as time...”, *SoundCloud* – <https://soundcloud.com/sophiestone27/sets/as-sure-as-time>— accessed on 8<sup>th</sup> August 2017.

<sup>23</sup> Jonathan D. Kramer, “New Temporalities in Music”, op. cit., 544.

<sup>24</sup> Henri Bergson, op. cit., 191.

these examples, lived and embodied experience is a vital part of the perception and performance of duration: this can be seen in the role that the body takes in determining duration in Zaldúa's work, the individualised approach to determining sound and action in Spahlinger's music, the decision-making process that enacts the process of Gisby's music live in its performance and in Stone's unequal iterations which deny predictability to those who experience the events in her series.

In each piece, units of duration are clearly perceptible, but the experience for the listener is that of the work as a whole rather than a series of individual, durational actions. Bergson writes, "real duration is made up of moments inside one another and when it seems to assume to form of an homogenous whole, it is because it gets expressed in space".<sup>25</sup> The units of duration described in the case of each work here are the expression of duration in space, and these persist in the documentation of the works as scores or recordings. Conversely, in performance, it is their homogenous whole to which attention is drawn: an experience of the "vertical time" or extended moment of each work. In so doing, they invite the listener to consider the temporal nature of the music itself.

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<sup>25</sup> Ibid., 232.

## Summary

This article explores the way that the performance of temporal processes in recent contemporary music reveals something about the nature of musical time. While varying definitions of time and time in music could be offered, the authors focus on the experience of time passing in music. Process music offers excellent case studies for such an investigation as it deals with time as a part of its material, offering the opportunity to experience time as time: the expression and experience of units of time that are defined by, and enclose, processes, in works whose forms are defined by their durations. This experience of musical time has been described by Jonathan D. Kramer as ‘vertical time’ (1981/1988): the extended perception of a single moment. Such an experience can be identified in Steve Gisby’s *Iterative Music* (2014 – ) and Alistair Zaldua’s *foreign languages* (2013–17). The moment-to-moment sonic details of the works are undefined and are discoverable only as they unfold, highlighting the unpredictability of sometimes highly prescriptive music.

Henri Bergson’s (1889;1910) *Time and Free Will* outlines the distinction between time as units of duration and ‘real duration’, which is the experience of time passing in the present. In the latter case ‘several conscious states are organised into a whole, permeate one another, gradually gain a richer content.’ (1910, p.122). The duration of Mathias Spahlinger’s *eigenzeit* from *vorschläge* (1992–93) is determined by its processes, which are undetermined until they are enacted. Sophie Stone furthers this in “*As sure as time...*” (2016 – ) by imagining each performance as a unit of duration in a theoretical meta-performance. These pieces show how the performance of temporal process makes concrete the quantitative nature of duration and shifts the focus of the listener to ‘vertical time’. By examining the nature of time in these works, this article outlines how such works invite the listener to consider the temporal nature of the music itself.