Pendulum V: DM: “Vitality, Exhaustion and Fleeting Equilibrium”

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ABSTRACT

Pendulum V: DM

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This dissertation is a score and companion essay to the musical composition, Pendulum V: DM. The full score of Pendulum V: DM is included as the appendix.

The topics covered include the use of physical movement and physical shape as models for musical structure and texture; the relationship of timbre and texture to the cognition of structural complexity; the paradox of difference and repetition; the ambiguity between physical gesture and audible structure; and the use of various characteristics of schizophrenia (considered as a virtual phenomenon, not solely as an actual clinical condition) as a model for the representation of expansion and interconnectivity.

In the essay I discuss the ideas listed above, show how they are related to one another, and demonstrate how in some respects they are all individually analogous to multiple characteristics of one important unifying model for many of my compositions: pendulums. I alternate between technical and aesthetic descriptions of the work, in order to demonstrate how these ideas have been musically integrated. I also refer to other recent compositions of mine (String Quartet No. 3: “lift-tilt-filter-split” and Pendulum VI: “Trigger”) that are closely related, in order to demonstrate how these concepts have been applied in other instrumental contexts.
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“Pendulum V: DM: Vitality, Exhaustion and Fleeting Equilibrium”

Milan Alexander Mincek

Introduction:

"Comment c’est" 1

_Pendulum V: DM_ is a 17-minute work for large ensemble and live electronics. The piece was commissioned jointly by the Wet Ink Ensemble and AMP, with support from the TANK performance space and the National Endowment for the Arts. The piece was premiered on November 10th, 2009 by the Wet Ink Ensemble, under the direction of Carl Bettendorf at the TANK in Manhattan, NY.

_Pendulum V: DM_ is the most ambitious presentation of many concepts that have been critical to my recent musical thinking—namely, the use of physical movement and shape as models for musical structure and texture; the relationship of timbre and texture to the cognition of structural complexity; the paradox of difference and repetition; the ambiguity between physical gesture and audible structure; and the use of various characteristics of schizophrenia (considered as a _virtual_ phenomenon rather than an _actual_ clinical condition) as a model for the representation of expansion and interconnectivity.
In the following essay I will discuss the ideas listed above, show how they are related to one another, and demonstrate how in some respects they are all individually analogous to multiple characteristics of an important unifying model for many of my compositions: pendulums. I will alternate between technical and aesthetic descriptions of the work, in order to demonstrate how these ideas have been musically integrated. I will also refer to other recent compositions of mine (String Quartet No. 3: "lift-tilt-filter-split" and Pendulum VI: "Trigger") that are closely related in order to show how these concepts and practices have been used in other instrumental contexts. Referencing these peripheral works will also demonstrate how my ideas relating to musical form have evolved, and how the fundamental musical materials and processes used within these forms have proliferated.

Additionally, I will reference other important influences (including Gilles Deleuze, Samuel Beckett, clocks, comic-book characters, gestalt theory) in the hopes of getting closer to the broader social meanings embodied by the work. However, as this essay is not a critique of someone else's work, but rather a companion to my own musical composition, the concepts to be referenced and the ways in which they will be defined and discussed are not intended to affirm or contradict how they have been used or understood by others. Instead, they are intended to merely reflect my own understanding of how they helped shape my approach to the composition of Pendulum V: DM. This is not to say that a more objectively critical description of the work is not possible. In fact, it would be welcomed. However, as the composer of the work at hand, I am in the awkwardly unique position of knowing most everything about how and why the work was conceived and put together, but incapable of experiencing the work removed from the knowledge
and experience of its construction. This leaves me incapable of describing exactly what it is, but privileged to describe how it is.

Finally, because many of the ideas and extra-musical models to be described are often referred to as both actual and virtual, and since these terms are used in many fields with varying connotations, it is perhaps useful to present a more clear definition of these terms before moving forward.

My own descriptions of the virtual can be thought of as a hypothetical essence analogous to actual phenomena. The actual happens physically, while the virtual is of the mind and constructed theoretically. It is imagined, or remembered, or expected. Put more simply, the virtual is an image or idea that is not purely physical. The virtual may either attempt to replicate or distort the fundamental characteristics of actual things and events.
I. A Collection of Pendulums

“A body suspended from a fixed point so as to swing freely...Something (as a state of affairs) that alternates between opposites.” ²

Pendulums reveal complex forces through simple movements. A pendulum rests at a position of equilibrium. When it is set in motion, a suspended weight moves away from its initial position until gravity forces it back toward the position of equilibrium. However, because of the weight’s inertia, it moves through and then beyond the point of its initial equilibrium, in the opposite direction, until gravity once again forces it toward its resting position. These oscillations repeat in regular periods unless they are acted upon by other forces.³

There are of course many actual and virtual versions of the above scenario, which are directly linked to a pendulum’s design and environment. For example, a simple gravity pendulum is a theoretical model, which assumes an environment without friction, allowing the pendulum to oscillate with a constant amplitude. Real pendulums, however, operate in environments full of physical resistance, causing the amplitude of their swings to dissipate over time.⁴

Pendulum V: DM (henceforth PVDM) is the fifth part of an ongoing series of pieces inspired by physical, temporal, and spatial phenomena demonstrated by the simple swinging motions of pendulums, along with some of the more complex forces, environments and mechanisms that make the pendulum’s movement continue or dissipate.
While the pieces in this series do mimic literal aspects of pendulum behavior, they are more commonly characterized by the musical representation of abstract relationships between binary oppositions in constant, fluctuating oscillation. Sometimes these oppositions oscillate discretely on a local temporal level, but at other times they are combined, overlapped, or occur across an expanded period of time. The intended result is the creation of a musical environment in which all of the singular musical materials have a direct relationship to both the local and global formal strategies, and can be connected to one another along numerous paths, in as many ways as possible.

Some of the oppositions in *PVDM* focus on the basic parameters of sound and are manifested by simple musical structures. They are intended to be easily recognized. The following list presents a few of these recurring oppositions, along with a musical example of each. I will call this list group A:

*High – Low* (Represented by the opposing register peaks of the contra-bass flute gesture in Example 1).

*Loud – Quiet* (Demonstrated by the opposing dynamic peaks of the saxophone gesture in Example 1.)

*Short – Long* (Demonstrated by the choked cymbal vs. the sustained chord in Example 2, measures 145 and 146.)
Example 1.

\[ \begin{align*}
&= \text{7.2} \\
&\text{(Hermes Alisc) Sim.}
\end{align*} \]

\text{Contr.B.Fl.} \\
\text{Oboe} \\
\text{Bb Bass Clar.} \\
\text{Tmr Sx.} \\
\text{Tgm.} \\
\text{Perc. 1} \\
\text{Perc. 2} \\
\text{Elct. Chr.} \\
\text{Vla.} \\
\text{Vla.} \\
\text{Va.} \\
\text{Cbs.}

\text{Concert. (wo-wo)}
Example 2.
However, there are other oppositional classifications that are represented either by more complex structural relationships, or by metaphorical associations that are more subtle and less easily discerned. The following list is group B:

**Harmonic – In-harmonic:** This is a distinction between sonorities that are closer to the harmonic series and those that are not. (Demonstrated by the oscillating chords in Rehearsal letters D-E of the score and additionally, those chords vs. the electronic sounds).

**Organic – Mechanical:** This is a distinction between smooth continuity and striated periodicity (Demonstrated in Example 1 by the continuous growth and decline of the trumpets vs. the on, off periodicity of the cello).

**Audible – Physical:** This is a distinction between the cause and effect nature of instrumental sound production (I will delay presenting an example here, as this relationship will be the focus of section VI).

**Same – Different:** This is a complex, multi-tiered perceptual relationship between how musical structures are identified and classified in relation to memory and expectation. (Represented by the guitar and perc. 2 vs. perc. 1 in Example 3. This contradiction/paradox will be the focus of sections IV, V and VI).
The distinction between these two larger collections of recurring oppositions, group A and group B, creates a broader dialectic, group C:

*Clear – Ambiguous*

The oscillation between clarity and ambiguity is perhaps one of the most important relationships in *PVDM*. It is demonstrated by various types of exchange and overlap between groups A and B. For example, all of the oppositions in groups A and B can be either singularly articulated or presented in combinations, resulting in variously dynamic textures. The manner in which these materials are connected and combined occurs in three general ways:  

1. "*Connective Synthesis*” in which a selective accumulation of *similar* structures combine to form a larger combination. This is demonstrated by the combination of flute, trombone and electric guitar in Example 1.

2. "*Disjunctive Synthesis*” which connects and combines *dissimilar* structures resulting in disjointed oppositions. This is demonstrated by the combination of strings, flute, trombone, perc. 1 and guitar in Example 4.

3. "*Conjunctive Synthesis*” which combines connective and disjunctive synthesis in a quasi-diffuse manner, allowing the characteristics of both to be concurrently identifiable. This is demonstrated in Example 4 by the disjunctive synthesis of strings, flute,
trombone, perc. 1 and guitar—combined with the connective synthesis of oboe, clarinet, saxophone and perc. 2.

These modes of synthesis are important not only to the connectivity of isolated, singular structures, but also to the connectivity of larger episodic events in the broader formal scheme of the work as well. However, before I go any further in that direction, it is important to momentarily continue discussing the title of the work, so that a broader network of connections may be more easily recognized.
Example 4.
II. DM?

"Schizophrenia is a breakaway into the unstable equilibrium of continuing self-invention."  

While all the pieces in this series have a generic "pendulum" title, indicating that they share some sort of general pendulum theme, most of them also have a more specific subtitle. The subtitles may refer to a particular feature of pendulum behavior that the individual pieces focus on. For example, in another work of mine, *Pendulum VI: "Trigger,"* the subtitle refers to the impulse mechanism in a clock pendulum that is responsible for countering the effects of drag. Sometimes, however, these subtitles offer a more poetic description of the work and may be either closely related to the prevailing pendulum theme or quite tangential to it. *PVD* falls into the latter category.

"DM" is an abbreviation for Doctor Manhattan, a comic book character from a DC Comic book series published in the late 1980s entitled the *Watchmen.* The series was subsequently adapted for film and released in early 2009.

One of the main plot lines in the *Watchmen* involves the crisis, metamorphosis, and simultaneous expansion and decline of a physicist, Dr. Jon Osterman. The following is a brief summary:  

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6. Quoted from the series description.

7. Quoted from the series description.

8. Quoted from the series description.
While working in his laboratory, Dr. Osterman is accidentally trapped in an “intrinsic field subtractor.” This event culminates in his complete physical disintegration. It is implied that the accident has a remarkable effect on his consciousness, which is somehow not destroyed in the accident. In time, his consciousness is able to reconstruct a new physical body (perhaps due to his childhood mastery of watch and clock assembly combined with a highly-advanced understanding of physics). However, his new physical form and mental state are fundamentally different in nature from his previous self. Jon’s new self allows him to completely manipulate all aspects of matter and energy. He also has a complete understanding of the physical world’s construction at the most basic level. This control extends to the complete manipulation of his body. He also has an expanded perception of time, which allows him to perceive past, present, and future events simultaneously. These powers make him an attractive asset to the U.S. military. They call him “Doctor Manhattan.”

Perhaps because of his unique perception of time, energy, and matter, Dr. Manhattan gradually becomes more and more alienated from human concerns. His friends can no longer understand him and he no longer relates to them in the same way. It seems as though his perception of reality becomes so devoid of shared experiences that he eventually becomes incapable of normal human emotions. He almost completely cuts himself off from humanity (he actually spends a stretch of time in self-exile on Mars). He immerses himself in problem-solving and creation.

The types of alienation exhibited by Dr. Manhattan are in some ways characteristic of schizophrenia. For instance, he no longer wears clothes and often seems nearly catatonic. In
fact, even some of Dr. Manhattan’s powers are characteristic of schizophrenia. For example, his ability to manipulate his body often results in the splitting of his self into multiple selves, each operating independently, but all still concurrently, him.

What makes Dr. Manhattan such a compelling character is that the result his schizophrenic alienation manifests both positive and negative attributes. He is not solely debilitated by his detachment. On the contrary, he is motivated to create and discover. As the hero, Dr. Manhattan is an idealized, virtual representation of schizophrenic characteristics considered as positive traits. In many ways, Dr. Manhattan is a portrayal of the schizophrenic as “the enlargement of life’s limits through the pragmatic proliferation of concepts.” He is an intellectually curious, motivated, goal-oriented, albeit emotionally flat character, offering both subtle contrasts and similarities to other portrayals in literature. Consider, for example, Gilles Deleuze’s comments regarding Samuel Beckett’s characters:

“Exhaustion is something entirely different: one combines the set of variables of a situation, on the condition that one renounce any order of preference, any organization in relation to a goal, any signification... Beckett’s characters play with the possible without realizing it; they are too involved in a possibility that is ever more restricted in its kind to care about what is still happening. The permutation of “sucking stones” in Molloy is one of the most famous texts. In Murphy, the hero devotes himself to the combinatorial of five small biscuits, but on the condition of having vanquished all order of preference, and of having thereby conquered the hundred and twenty modes of total permutability.”
Daniel W. Smith suggests a relationship between Deleuze’s remarks and schizophrenia:

“If Deleuze sees a fundamental link between Samuel Beckett’s characters and schizophrenia, it is because Beckett likewise situates his characters entirely in the domain of the virtual or the possible: rather than trying to realize a possibility, they remain within the domain of the possible and attempt to exhaust logically the whole of the possible, passing through all series and permutations of its included disjunctions.”

The distinction between the schizophrenic behavior of Dr. Manhattan and the behavior demonstrated by Beckett’s characters, though not in stark contrast to one another, offers yet another relationship to consider: The realization of specific, preferred possibilities (connective) vs. the exhaustion of all possibilities devoid of an ordering preference (disjunctive).

This dichotomy can be divided into a further binary opposition. The realization of specific, preferred possibilities is positive, in that it progressively imagines and attains goals, but negative, insofar as it is limited to its own goals and excludes other possibilities. Similarly, the exhaustion of all possibilities without an ordering preference is negative, in that it is seemingly aimless, but positive insofar as it is inclusive and experimental, exploring unimagined possibilities.

With these distinctions in mind, Beckett’s characters along with Dr. Manhattan both demonstrate, to some degree, positive aspects of schizophrenia in a virtual context. In doing so,
they both attempt to redeem the overwhelmingly negative aspects of schizophrenia considered as an actual clinical condition.

These schizophrenic distinctions play an important role in how the form of *PVDM* is constructed. The Doctor Manhattan narrative also influences the large-scale form of *PVDM*. However, to perhaps best understand the overall shape of the piece I must return once more to the subject of pendulums.
A pendulum inhabiting a two-dimensional environment swings from left to right. The amplitude peaks in the diagram below (the position of circle 1, and circle 5), symmetrically envelope the position of equilibrium (circle 3), so that the observation of one full period creates a visual palindrome. Hence, the large-scale form of $PVDM$ is in part modeled after a palindrome, inasmuch as it can be applied to the passing of time.
to roughly approximate a palindrome (though only in terms of general character and proportion, not in terms of exact material content).

The third section, the *center*, is also a palindrome and thus a compressed version of the *whole*. However, once I had accepted that I would use compression as a way of embedding the entire form into its central section, I decided to then inject the idea of compression back into the notion of the *whole*. To this end, the second half of the piece, the *mirror*, is a compressed version of the first. I then re-adjusted the *center* to once again reflect the *whole* (i.e. Section 3 also has a compressed mirror).

The idea of palindrome is combined with the representation of the Dr. Manhattan narrative. The first main section (parts 1 and 2) of the piece represents Dr. Osterman. The central section represents his metamorphosis. The third main section (parts 4 and 5), the *mirror*, represents Dr. Manhattan; the new self, fundamentally different in nature from the previous.

The following is a summary and rough musical characterization of each section within the large-scale form:

**Section 1:** Generalized textural activity, leading to factionalized activity.

**Section 2:** Massive electronic *catastrophe* against unified instrumental activity, leading back to factional activity.

**Section 3:** Fragments leading to stillness leading back to fragments
Section 4: Massive electronic catastrophe against factionalized activity (a compressed mirror of section 2).

Section 5: Generalized textural activity, leading to factionalized activity (a compressed mirror of section 1).

Most of these five sections can be divided into yet smaller episodes. The following is an outline of the divisions within each large section:

Section 1 can be divided into four episodes: (1a) Measures 1-12; (1b) measures 13-24; (1c) measures 25-60; and (1d) measures 61-96.

Section 2 can be divided into 3 episodes: (2a) Measures 97-145; (2b) measures 146-155; and (2c) measures 156-188.

Section 3 can be divided into 5 episodes: (3a) Measures 189-196; (3b) measures 197 and 198; (3c) measures 199-216; (3d) measures 218 and 219; (3e) measures 221-225.

Section 4 cannot be divided. It is continuous and stretches from measures 226-284.

Section 5 can be divided into 3 episodes: (5a) Measures 285-314; (5b) measures 315-320; and (5c) measures 321 to the end.

The distinctions arrived at previously regarding the characteristics of schizophrenia also relate to the three modes of synthesis previously discussed in regards to the connectivity of isolated structures and textures. Below is a description of how these modes are re-applied to the connectivity of local and global formal strategies.
(1) **Connective synthesis** links one episode or section to a similar one, usually by way of accumulation or goal-oriented processes. This is demonstrated on a local level by the four episodes of Section 1, which accumulate and filter in a connective manner. It is demonstrated on a more global level by the connection of Section 1 with Section 2.

(2) **Disjunctive synthesis** abruptly connects dissimilar, opposing episodes or sections without the equivalent of a musical explanation. This is demonstrated on the local level by the abrupt shifts between the three episodes of Section 2, and on a more global level, by the abrupt shift from Section 2 to Section 3 (and then from 3 to 4).

(3) **Conjunctive synthesis** combines both connective and disjunctive synthesis, *within* an episode or section, allowing each to simultaneously unfold along separate paths. This is demonstrated in Section 4 by the overlapping of multiple connective, goal-oriented processes.

Connective synthesis is representative of the Dr. Manhattan-like realization of specific, preferred possibilities, while disjunctive synthesis represents the Beckett-like exhaustion of all possibilities devoid of an ordering preference. Conjunctive synthesis combines the two and mediates the positive and negative qualities of both.
IV. Sonic Fields: One and Many; Shape and Movement

"Number may be defined in general as a collection of units, or, speaking more exactly, as the synthesis of the one and the many. Every number is one, since it is brought before the mind by a simple intuition and is given a name; but the unity which attaches to it is that of a sum, it covers a multiplicity of parts which can be considered separately." \(^{14}\)

– Henri Bergson

Perhaps one of the more salient features of PVDM is the presentation of variously dynamic textures. While I have described and categorized the modes of syntheses used in constructing many of these textures, it would be useful now to approach the subject of texture from another angle.

I can best describe the textures in my music as sonic fields. A sonic field is a network of gestures perceived most immediately as a generalized musical texture, but which has multi-stable\(^{15}\) perceptual characteristics as well, allowing the listener to swing back and forth from the recognition of the unique parts and the undifferentiated whole (cognitive pendulum?). These textures also allow multiple views of the individual sonic objects within each field. These multiple views are intended to approach a musical representation of invariance\(^{16}\) in gestalt theory.
Unlike the use of melody in many other types of polyphonic textures, these fields have very little to do with the representation of language. They are not meant to be mimetic of the human voice. A sonic field is more analogous to the physical, visual and tactile. However, it is both the movement in and of the object, considered collectively and separately. It is like a droplet and the rain, a grain and the sand, a tree and the forest. So, instead of expressing narratives with melodies that relate to patterns of speech, grammar, rhetoric, or the syntax of language, this piece uses successions of various dynamic textures to represent complex interactions as they relate to shape and movement.

One of the things I find most interesting about these textures is their ability to absorb repetitions within networks of difference. In Example 5 for instance, the repetitions within each individual part are obscured by the constantly changing relationship of interconnectivity among all the parts considered collectively. Of course when fixing one’s attention on individual parts the repetitive structures are quite clear. However, the timbral profile of individual parts and the ways in which they are distributed collectively plays with the listener’s ability to swing back and forth between the recognition of the one and the many.

In a subsequent work, Pendulum VI: “Trigger,” I use the same idea in different ways. In Example 6, the opening section of the piece subjects a short rhythmic structure to many exact repetitions. However, with each repetition the structure is articulated with a slightly different timbral distribution, rendering the repetition nearly imperceptible within a web of timbral
differences, thus depriving repetition of its two most important characteristics: identity and expectancy.
Example 6.
In another subsequent work, *String Quartet No. 3: “lift-tilt-filter-split”*, I take this idea further still, by adding rotating pitch collections and register relationships, along with dynamic and gestural variations, to the recognition of repetitive rhythmic structures. For instance, in Example 7 the composite rhythm of the four phrases is nearly identical, as is the timbre, pitch and register content. However, the distribution is in constant flux. The result is both always the same and always different, depending on which parameters the listener chooses to identify and how they choose to identify them. It is a complexity of sameness and thus a complexity of difference, embedded in a hidden network of repetition.

Example 7
V. Identity: Difference and Repetition

"Modern life is such that, confronted with the most mechanical, the most stereotypical repetitions, inside and outside ourselves, we endlessly extract from them little differences, variations and modifications. Conversely, secret, disguised and hidden repetitions, animated by the perpetual displacement of a difference, restore bare, mechanical and stereotypical repetitions, within and without us... The task of life is to make all these repetitions coexist in a space in which difference is distributed" 17 —G. Deleuze

In the previous section I talked about the ways in which complex distributions of similar structures, within dynamic textures, can obscure repetition. In this section I'll explore how and why the opposite can and should be realized; how simple distributions of repetitive loops both mute and amplify difference.

Gilles Deleuze’s magnum opus, Difference and Repetition, along with many of his other works, have been and continue to be hugely influential to my work as a composer. It is not my intention to concisely define or describe the numerous concepts Deleuze articulates and the myriad connections among them. The following simply summarizes my interpretations of the ideas most important to my own work.

It is impossible to actually categorize anything as being purely different from anything else. It is also impossible to actually repeat any event identically, which seemingly circles back to
paradoxically suggest a world of difference. There is no actual *pure* difference. There is no actual *pure* repetition. Instead, there are infinite connections, virtual and actual, made possible by the absence of absolutely fixed identities. These connections amount to a network of infinitely distributed positions in fluctuating proximity to both the collective whole of *Being* and the individual sense of *Being*, which can be considered simultaneously as the *Equality of Being* (all things *being equal* since un-fixed identities don’t allow for hierarchical classifications or for distinctions between parts and collections).

"A single and same voice for the whole thousand-voiced multiple, a single and same

Ocean for all the drops, a single clamor of Being for all beings."  

Difference and repetition are significations that attempt to succinctly order and classify according to selective values that disrupt the non-preferential nature of equality (certain differences negate *being equal*, certain repetitions add to it). The idea of repetition is a complex, connective form of *being analogous*, which allows us to assign an approximately fixed identity to an event by dint of accumulated boundaries. The idea of difference is a simple disjunctive form of *not being analogous (being other)*, which plays against the expectancy and identity presented by repetition. However, one cannot exist without the other. Difference and repetition feed into and off of one another. Complex differences hide in simple repetitions, while complex repetitions linger in various states of difference. Identity can be partially described as the navigation between the perpetual divergence and coalescence of these two signifiers in proximity to equality.  

Consider the following examples:
The series (A % & k $ 0 3...) is a simple form of difference, because there are seemingly clear distinctions between each symbol in the series. These simple differences are imbedded in a complex form of repetition, insofar as the series has been seemingly constructed of an evenly distributed accumulation of equal symbols. However, there is a paradox here. We cannot attach individual identities to the symbols within the series without discernable boundaries between them. There is no way to recognize what a part is, since the series can be perceived in any number of groupings considered singular, i.e. ([A%&] k [$ 0] 3...). Hence, the notion of even distribution is obscured, and the complex repetition goes completely unnoticed. Furthermore, difference itself is minimized by this inability to parse the overall series into differing parts. We are left simply to perceive an ambiguously variable assemblage (a ubiquitous feature of many pieces of contemporary music, though not necessarily a bad thing).

Conversely, the series (E E E E E...) is a simple form of repetition. However, it is embedded in a complex form of difference, insofar as E is not *exactly* E, and the E after five E’s is not the seventh E, since none of these E’s can ever occupy the same space at the same time. This form of simple repetition allows us to explain the relation of virtual events to actual events. It demonstrates complex relations between memory, experience and expectation by establishing a sense of periodic boundaries that become more and more recognizable as the series proliferates. In other words, by attempting to replicate an event, an identity of parts begins to materialize.

If, however, a loop characterized by the second series (E E E E E...) is injected into the first series (A % [[;:$ K:] $ 0...), boundaries are established in both. We can perceive the identity of
the loop (§ K) as belonging to a class distinct from the overall series. This in turn establishes expectancy. Once we hear “§” we now expect to hear “K”. If after “§” we do not hear “K” then we more succinctly perceive a simple difference because what we hear is clearly not what we expected to hear.

Repetition establishes identity, which in turn leads to expectancy. Expectancy is crucial to difference. Looping thus clarifies differences within differences, and in turn draws a stronger connection between the simple differences in the first series to the complex differences imbedded within the loop itself (the second series).

With this in mind, my use of repetitive loops has two main purposes: (1) To generate isolated, complex perceptual scenarios that allow the listener to recognize subtlety in the seemingly redundant (E E E E...); and (2) the use of repetitive structures within broader musical contexts full of differences, creating an arrested flow that somewhat paradoxically establishes an organic continuity between the various ways difference and repetition feed into and off of one another (A% [[: $ K : ]] $0@[[: E : ]] ? [: T :]...).

In larger metaphorical frameworks, difference and repetition have many representations in my music. However, there are some general approaches to musical representation that should be considered.

For instance, there are many positive extra-musical concepts that connect well with the
fluctuating ebb and flow of difference and repetition. However, as I have already briefly discussed in regards to schizophrenia, I believe it is vitally important to also connect these concepts to aspects of daily life that are particularly negative, challenging and even oppressive, thus allowing art to not simply reinforce the positive, but to also accuse, re-channel and in some small ways redeem the negative by transposing it into something positive (Bleckner’s series of paintings of various malignant tumors comes to mind).

To this end, difference and repetition in my music can be considered on the one hand, to draw upon aspects of rampant commercialism as an extra-musical model, demonstrated in our daily lives by the repetitive production of “identical” objects for mass consumption and the declines and returns of these repetitions, permutated across widely differing social strata, in an effort to saturate and exhaust the potential for commercial profit and power; and on the other hand, to represent the production of art itself, which allows us to experience endless differences in an overwhelming variety of individually equal handlings of seemingly same subjects; the dialectic being the pure desire for power versus the desire for pure production.

Of course, there are many other extra-musical connections that can be made. Repetition can also be simply considered one’s physical continuation, one’s vitality, one’s life. It is embedded in the difference to physical continuation, the imminence of one’s death. Hamlet might have easily said (with notably less eloquence): “to repeat being, or to differ from being.”

Sounds also live and die. Repetition is the creation of numerous sonic identities and the futile
attempts to fix them in time, to minimize their decline, to not let them die. Difference is what happens next and what happened before. It is the void, or that which unexpectedly fills it with something surprising and new.
VI. Variation: Audible – Physical

"The schizophrenic quickly shifts from one singularity to another, never explaining events in the same manner, never invoking the same genealogy." 21- Daniel W. Smith

In the previous sections I discussed some of the ways in which difference and repetition help shape identity and expectation in structure, form and texture. In this section I will focus on how individual instrumental techniques also contribute to establishing identities and expectations, and how by stretching the boundaries of these identities, a shared space of collectively equal and individually distinct identities is created.

Every instrument has a cause and effect relationship with the production of sound. The player acts upon the instrument and a sound results from that action. In other words, the physical triggers the audible. PVDM plays with the ambiguous relation between how various physical gestures and audible structures feed into and off of one another.

First, physical gesture can be considered a basis for connectivity. For instance, if a small collection of physical gestures is uniformly distributed to all of the instruments, there is a collective sense of doing the same thing. However, since instruments are constructed differently, it follows that the resulting sounds from each will at times be strikingly varied. For example, the idea of physically applying extreme pressure to all the instruments collectively results in a variety of different sounds. More specifically, in Example 8, the physical back and forth arm
motions carried out by the saxophone, trombone, percussionists and bass creates multiple sonic results. Thus, uniform physical gestures are filtered by the designs of the instruments into many similar and different audible structures, creating a sense of individuality within an environment of collective physical unity.

Conversely, audible structure can now be considered as the basis for connectivity. For instance, if a small collection of audible structures is uniformly distributed to all of the instruments, there is a collective sense of *sounding* the same. However, to produce similar sounds the players will have to employ different physical tactics, some subtle, others drastic. For example, glissandi can be produced by all of the instruments, allowing them to sound similar, but requiring them to use different physical actions. In *Example 9*, the flute accomplishes a harmonic glissando using air pressure, while the cello uses hand movement.

Finally, the first two methods can be intertwined by considering how on each individual instrument the slightest variations to physical gesture can cause drastic changes in audible structure (and vice versa). For example, if a violinist slides a finger the length of the fingerboard while pressing the string, we hear a continuous glissando. However, if the player performs the same physical task while lightly touching the string instead of pressing it, we hear a discontinuous series of harmonics. This idea can be transferred to another instrument. For example, if the flutist plays with regular air pressure while sliding the mouthpiece away from his or her embraasure, we can hear a continuous glissando. However, if the player performs the same physical task, while using much lighter air pressure, we hear a discontinuous series of harmonics
("whistle tones"). This idea can then be passed to another instrument, and then another, and another, etc… From these relays, questions arise: which resulting structures best represent the nature of each physical gesture? On what sounds can all the instruments most seamlessly intersect, and at what physical price do they pay for this coexistence? By exploring such ambiguities, it is my hope to demonstrate the futility of succinct classification.
Example 9

A

\( \text{I}=60 \)

\( \text{(Harmonic Gliss)} \)

\( \text{(air)} \)

\( \text{Tr.} \)

\( \text{Ob.} \)

\( \text{Cl.} \)

\( \text{Sn.} \)

\( \text{Timp.} \)

\( \text{Perc.} \)

\( \text{Perc.} \)

\( \text{Gtr.} \)

\( \text{Vln.} \)

\( \text{Vla.} \)

\( \text{Vc.} \)

\( \text{Cb.} \)
VII. Centering: Harmony

There is no single systematic approach to harmony in *PVDm*. In fact, the sonorities in the piece are often the result of contrasting approaches. For example, some sonorities instrumentally synthesize actual and virtual acoustic phenomena (i.e. the overtone series, amplitude modulation, frequency modulation and spectra from actual instruments), but other harmonies result from more abstract intervallic relations. These two approaches are frequently combined.

The acoustic sonorities are more characteristic of timbral relationships in the context of timbre signified as a fused collection of pitches considered as a singular sum. Conversely, while instrumental pitches actually *are* fused sums, in this context the intervallic approach signifies discernable pitches as singular parts, relating more directly to the recognition of isolated pitch structures and voice leading.

The unifying harmonic model for the use of these contrasting approaches is demonstrated by multiphonics. Multiphonics have the unique characteristic of being *quasi-fused* sounds, allowing the hearer to discern multiple distinct pitches that result from various acoustic modulations of fused timbres. In other words, multiphonics are both fused *and* diffuse; they are harmonic *and* in-harmonic. They also relate to the overall form of *PVDm*, insofar as the distribution of their constituent frequencies results from the quasi-symmetric modulating process of addition and subtraction (among others), thus forming palindrome-like sonorities.
In Example 10, three groups can be distinguished:

(a) The electronic sounds.

(b) The combination of woodwinds (minus saxophone), brass, guitar, and percussion.

(c) The combination of saxophone and strings.

However, the above groups are simply the final instrumental distribution. To understand how these sonorities relate to one another, it is important to consider a different instrumental grouping:

(1) The combination of woodwinds (minus oboe), brass and strings.

(2) The combination of oboe, percussion, guitar and electronics.

Group (1) considers the saxophone multiphonic as the central component of a chord constructed of intervalllic relationships. The upper pitches of the multiphonic (Ab, Eb) together with the viola (Ab), trumpets (Eb, F), clarinet (C), violin (Eb, Db), and flute (Bb), combine to form a six note diatonic collection above the multiphonic (Ab, Bb, C, Db, Eb, F). Next, the lowest pitch of the saxophone multiphonic (G) together with the trombone (E), viola (D), cello (G, B), and bass (F#, A) combine to form a six note diatonic collection below the multiphonic(D, E, F#, G, A, B). Thus the multiphonic acts as a central axis connecting two pitch collections symmetrically mirroring one another at the interval of a tritone.
Group (2) is constructed by considering the more acoustic properties of multiphonics, which are synthesized by the electronic sounds and combined with the oboe, guitar and percussion (this relationship will be discussed further in the next section).

The distinction between these two harmonic approaches is demonstrated in more stratified contexts, as well. In Example 11 for instance, the combination of clarinet and saxophone alternates with the trumpets, creating a timbral oscillation on the notes D and D quarter-sharp. The D is approximately the seventh partial of E quarter-sharp, and the D quarter sharp is approximately the seventh partial of F. The fundamentals of these partials can be found in the bass (last measure) alternating with the contra-bass flute (first measure). These sonorities are meant to instrumentally synthesize the overtone series and create harmonic fusion.

However, in the same example a more intervalllic approach can also be observed. In the second and third measure of the example, the contra-bass flute bounces around the tone D by alternating between whole- and half-step intervals in various inversions from above and below. Likewise, the trombone establishes an intervalllic centering of D, by enveloping it symmetrically within the interval of a tritone (F-B). These symmetric intervalllic centerings are intended to represent the swinging motions of a pendulum to and from its position of equilibrium.
VIII. De-centering: "Intrinsic Field Subtractor"

*PVDM* uses Max/Msp to generate electronic sounds. These sounds are intended to expand both sonic and physical instrumental limitations. Of particular interest here are the multiphonic capabilities of wind instruments. Multiphonics can be produced in many different ways and can demonstrate numerous acoustic phenomena. The most common occurrence in multiphonic sounds is amplitude modulation. However, even when the sums and differences of specific modulations produce combinations that would suggest *in-harmonic* sonorities, the prevailing sonic results are often quite *harmonic*. It is not precisely clear why this occurs, but it is more than likely because the carrier and the modulator are not pure frequencies. They are fused harmonic timbres, subject to the design of the instrument. In other words, purely non-harmonic sonorities containing discernable pitches cannot be realized on instruments designed to produce resonant harmonic timbres.

Many of the electronic sounds in *PVDM* are based on instrumental multiphonics. Like multiphonics, the electronic sounds are generated using amplitude and additionally, frequency modulation. However, unlike multiphonics, the electronic part uses pure sine tones as a starting point to generate these modulations, which allows the resulting sounds to be purely *in-harmonic*.

In addition to expanding the in-harmonic range of instrumental multiphonics, the electronic sounds also extend the sustainability of each of these sounds and the dynamic range of each as
well. For example, the electronic part acts as an extremely loud and persistent drone for much of the piece, a task too physically strenuous for instrumental practice.

The following list catalogs all the electronic components and gives a more detailed description of each:

(1) *Harmonic*/*In-harmonic multiphonics*: These sounds are continuous and in constant flux. They are generated by frequency modulation. A clarinet model acts as the carrier. A sawtooth wave is the modulator. However, the timbre of the clarinet sound and the saw wave are in constant fluctuation, as they are randomly being filtered within narrowly set margins.

(2) *In-harmonic multiphonics*: These sounds are not continuous. They are a collection of modulations that rotate periodically at random, within narrowly set margins. The modulations are generated by fluctuating wave forms.

(3) *Sine tone glissandi*: These sounds are also continuous. Four sine tones simultaneously sweep at different speeds, along different trajectories. They are intended to interfere with everything, causing audible beatings among themselves, with other electronic sounds, and with the instruments.
(4) *White noise* and *pink noise*: These sounds are continuous and are intended to blend with un-pitched instrumental sounds. They also are used to create *false* silences.

Beyond the practical function of extending instrumental limitations, the electronics play an extremely dramatic role in the overall shape of the piece. From the perspective of the Doctor Manhattan narrative, the electronic sounds represent the destroyer of Dr. Osterman, the "intrinsic field subtractor." However, they also represent the creator of Dr. Manhattan.

From a broader social perspective the electronic sounds are meant to represent both the awesome power of technology as a positive force for progress and expansion, and the frightening power of technology as a negative force for destruction.
Conclusion

"I have spoken of a voice telling me things. I was getting to know it better now, to understand what it wanted... Does this mean I am freer now than I was? I do not know. I shall learn. Then I went back into the house and wrote, It is midnight. The rain is beating on the windows. It was not midnight. It was not raining." ²²

The fundamental approach to the compositional process of PVDM is one in which all of the musical parameters, and the multiple ideas they represent, are intended to be connected, combined, and ultimately perceived as equal parts of a multi-stable whole. Timbre, texture, harmony, form, structure and gesture are the sum and parts of many collective sonic distributions, variously distributed across time, resulting in a singular musical composition.

It should be noted then, that while the connections between all these categories have been discussed individually in a linear manner, in an effort to make their individual functions more clear, the result obscures the true nature of how these parameters were conceived and intended to function. It would be most useful to describe these parameters all together at once, or at least in multiple coexisting streams (something music attains more easily). It is with this in mind that I return one last time to pendulums.

As a pendulum swings, it repeatedly passes smoothly through all the space and time between extremes without becoming fixed on any single position. PVDM presents a catalog of musical
extremes, but like a pendulum, does not become fixed on any one musical position. Instead, 

_\textit{PVDM}_ represents a refusal to choose any one side. Both sides of multiple polemics are treated as equals and are mediated by alternating in constant succession from one to the other, in an attempt to represent the futile insistence of having both, many, and all at once.
Notes

1 “Comment c’est” or literally “How it is,” is the title of a Samuel Beckett novel. It is also a pun on the French verb commencer, or “to begin.”


3 “What’s a Pendulum Anyway?” www.calacademy.org/products/pendulum/page1.htm


7 en.wikipedia.org/wiki/Watchmen

8 This plot summary is a combination of my own interpretations of the film version of the Watchmen, combined with descriptions about both the film and the comic book series. www.imdb.com/character/ch0060115/bio www.angelfire.com/comics/mooreportal/manhattan.html

9 Symptoms of schizophrenia include: Appearance or mood that shows no emotion (flat affect); Bizarre movements that show less of a reaction to the environment; False beliefs or thoughts that are not based in reality (delusions); Hearing, seeing, or feeling things that are not there; Problems with thinking often occur; Problems paying attention, thoughts “jump” between unrelated topics. www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001925/. Leucht S, Corves C, Arbter D, Engel RR, Li C, Davis JM. Second-generation versus first-generation antipsychotic drugs for schizophrenia: a meta-analysis. Lancet. 2009; 373:31-41. Epub 2008 Dec 6.


15 "Multistability (or multistable perception) is the tendency of ambiguous perceptual experiences to pop back and forth unstably between two or more alternative interpretations. Gestalt does not explain how images appear multistable, only that they do." Steven Lehar, *Gestalt Isomorphism and the Primacy of Subjective Conscious Experience: A Gestalt Bubble Model*. sharp.bu.edu/~slehar/webstuff/bubw3/bubw3.html

16 "Invariance is the property of perception whereby simple geometrical objects are recognized independent of rotation, translation, and scale; as well as several other variations such as elastic deformations, different lighting, and different component features." Steven Lehar, *Gestalt Isomorphism and the Primacy of Subjective Conscious Experience: A Gestalt Bubble Model*. sharp.bu.edu/~slehar/webstuff/bubw3/bubw3.html


Bibliography

Works by Samuel Beckett:


Works by Gilles Deleuze:


James Williams, “*Gilles Deleuze’s difference and repetition.*” Edinburgh University Press. 2003.
Pendulum V (2010)
for large ensemble and electronics

Alex Mincek
**Instrumentation:**

Flute/Contra Bass Flute
Oboe
Clarinet/Bass Clarinet
Tenor Saxophone
2 Trumpets in C
Trombone
2 Percussionists
Electric Guitar
Violin
Viola
Cello
Bass
Electronics: Max/ MSP

**Duration:** 17 Minutes

(Transposed score)
GO.