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Gesture in Steve Reich's Music and its Signification: A Referential Approach to His Process, Stylistic, and Postminimalist Works

Martin Ross, *The University of Western Ontario*

Supervisor: Cuciurean, John, *The University of Western Ontario*
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Abstract

When listening to minimalist music, one will more than likely notice the scarcity of materials. Small motifs and repetition pervade the surface, and one might be inclined to interpret such scarcity as mere redundancy of materials with seemingly few meaningful layers underneath the surface. When analyzing minimalist music, one will notice a similar pattern of scarcity. Music-theoretical scholarship on minimalist music, especially formalist analyses, primarily investigates the rhythmic and melodic connections spanning the entire work. The analytical uncovering of such scarcity through formal means has resulted in few novel analytical approaches and, consequently, an attitude that minimalist music itself is resistant to analysis.

This dissertation, both in its methodological basis and applied analyses, reconceptualizes minimalist composer Steve Reich's music such that it deemphasizes the quantifiable properties in favour of its qualifiable ones. The works themselves serve as representations of Reich's compositional activity. One way to conceptualize this activity is "energetic shaping," the definitive quality behind Robert Hatten's theory of musical gesture (Hatten 2004). This dissertation explores the signification underlying Steve Reich's music, primarily through a semiotically grounded theory of musical gesture.

Three different eras in Reich's compositional output will be examined. His early works of the 1960s focused on bringing an audible process to the listener's attention. In the 1970s, Reich focused on the rhythmic pattern as he developed his musical style. In the 1980s, the works began sharing similar compositional attributes. These three decades make up his process music, "stylistic" music, and postminimalist music, respectively. The gestures found in these eras are represented by a definitive feature of the work and

inferred by the subject of interest. Concerning the former, Reich's unique musical processes, the rhythmic pattern, and previous analyses are the representative features of interest. Concerning the latter, the listener, performer, and analyst are the ones to deduce the significance underlying each era. The result of this dissertation is an improved understanding of Reich's music and a new referential perspective that shows minimalist music being open to analysis rather than resistant to it.

Keywords: Steve Reich, minimalist music, postminimalist music, process music, referentialism, gesture, semiotics.

Summary for Lay Audience

Minimalist music emerged as a novel, American compositional practice in the 1960s. Its use of scarce musical material and repetition resulted in long works subjected to gradual change. One of the first composers to contribute to this practice was Steve Reich (b. 1936). His early works of the 1960s focused on bringing an audible process to the listener's attention. In the 1970s, Reich focused on the rhythmic pattern as he developed his musical style. In the 1980s, the works began sharing similar compositional attributes. These three decades make up his process music, "stylistic" music, and postminimalist music, respectively.

Previous music-theoretical scholarship on Reich has focused on connecting underlying elements spanning the entire work, especially rhythmic development. The minimal use of constantly repeating and gradually changing materials has led scholars to similar findings. Subsequently, because of the lack of novelty in analyses using similar methodologies, some scholars have considered Reich's music, and minimalist music as a whole, to be resistant to analysis. What has not been considered to the same extent is Reich's musical elements and how they influence musical subjects, including the listener, performer, and analyst. These musical influences are significant, meaning that elements of the music are able to signify other things for musical subjects to infer.

This dissertation investigates the signification in Reich's process, stylistic, and postminimalist music through musical gesture, a concept that Robert Hatten describes as the "energetic shaping" throughout the music (Hatten 2004). The signification behind these musical gestures will be explained through semiotics, which studies signs by their representation and subsequent interpretation. The significant attributes found in Reich's

musical elements reveal a composer who uniquely developed his compositional practice over three decades.

Dedication

To my grandmas, Mary Ann Goodman and Mary Jane Ross.

Acknowledgements

I would first like to acknowledge the Anishinaabek, Haudenosaunee, Lūnaapéewak, and Chonnonton, whose traditional territories are where this research was produced. This land continues to be home to diverse Indigenous Peoples (First Nations, Métis, and Inuit) whom I recognize as contemporary stewards of the land and vital contributors of our society.

My sincerest gratitude goes to my advisor, Dr. John Cuciurean. Your instructions to "just give me something that's logical" when beginning this dissertation gave me the freedom to explore different avenues of research, and your validation of my ideas following such avenues gave me the confidence to continue exploring. Much like the subject matter of this work, I deeply appreciate the pragmatism in your edits, advice, and guidance.

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As the saying goes, perhaps the real PhD is the friends made along the way, but I think the academic requirements with a dissertation to cap it off would contest that. Nevertheless, I want to thank Mitch Glover, Steve Janisse, Emily McCorkle, Mark McCorkle, Andy McTaggart, April Morris, Mary Blake Rose, Adam Roy, and Diana Wu for their support and for keeping me entertained through school coffee trips, board games, tabletop RPGs, recreation leagues, fantasy leagues, and all other get-togethers. Thank you also to Kristen Wallentinsen for encouraging me to consider Western for a PhD and for checking my work on the contour side of things. Finally, a special thanks goes to Chantal Lemire for her unwavering support, encouragement, feedback, and sincere enthusiasm in my work.

My final thanks goes to my family. This document would not have been possible without your support, encouragement, and love. Mom, Dad, Katie, Brandon, Annie, Eddie, Miles, Matt, Bill, Hanna, and Sloane: you have been in my thoughts throughout my studies and will continue to be in my future endeavors. The same gratitude goes out to my extended family—I would like to name you all, but unfortunately there is a word limit to this section. Thank you for everything and I love you all.

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Chapter 1

Introduction: On Minimalist Music, Analysis, and Approach

When listening to minimalist music, one will more than likely notice the scarcity of materials. Small motifs and repetition pervade the surface, and one might be inclined to interpret such scarcity as mere redundancy of materials with seemingly few meaningful layers underneath the surface. When analyzing minimalist music, one will notice a similar pattern of scarcity. Music-theoretical scholarship on minimalist music, especially formalist analyses, primarily investigates the rhythmic and melodic connections spanning the entire work. However, when an entire work contains only a few elements slowly developing for a significant amount of time, such as rhythmic shifts and harmonic sonorities, a formalist analysis uncovers the scarcity. The result of such music-theoretical scholarship spanning over thirty years is two-fold. First, so as not to reinvent the analytical wheel, it is rare to find articles, save for a few contributions, that follow up from previous methodologies. Second, this leads to only a few novel analytical approaches. Such an absence of novelty within the interpretation of minimalist music leads to scholars describing the genre as resistant to analysis.

In his article explaining the "problem" of minimalist music, Jonathan Bernard states, "An analytic approach to minimal music might be viable if it were less exclusively bound up with exactitudes."[1] My dissertation, both in its methodological basis and applied analyses, reconceptualizes Steve Reich's music from the 1960s to the mid-1980s

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[1] Jonathan W. Bernard, "Theory, Analysis, and the 'Problem' of Minimal Music," in *Concert Music, Rock, and Jazz since 1945: Essays and Analytical Studies*, edited by Elizabeth West Marvin and Richard Hermann (New York: University of Rochester Press, 1995), 266.

such that it deemphasizes the quantifiable properties in favour of its qualifiable ones. At the basis of each work is a representation of the compositional activity. One way to conceptualize this activity is "energetic shaping," the definitive quality behind Robert Hatten's theory of musical gesture. Thus, to avoid analyses "bound up in exactitudes," this dissertation explores the signification underlying Steve Reich's music, primarily through a theory of musical gesture. Before getting into the dissertation proper, this introductory chapter will discuss the factors which motivated me to take a different approach to Reich's music over a formalist one. I then give two detailed examples of referentialism, which will lead to a preliminary summary of a Peircean semiotic approach, which will aid in my application of musical gesture. Lastly, I will give a brief overview of the chapters that follow.

1.1 Literature Review: Favoured Towards Formalism

My research is primarily motivated by previous analytical and critical scholarship of minimalist music. Analytically, there has been a larger influx of formalist analyses compared to referential analyses. Formalist analyses inquire about structural events of a work and seek to quantify the findings numerically and categorically. Formal maps, schemas, formulae, reductions, and the like are used to represent an analyst's perceptual observations of the work.

Although there are many analyses to choose from on the formalist side, which can be found in my bibliography, the most notable analysis given its impact and rigor is Richard Cohn's 1992 article on Reich's *Violin Phase* (1967) and *Phase Patterns* (1970). Cohn not only found a new application for David Lewin's transformational networks in rhythmic space in the form of beat-class sets, but a newfound potential in analyzing

Reich's works and those of other minimalist composers. Following Cohn's research on

Reich, Roberto Saltini's 1993 article explored further use of beat-class sets, specifically

Union, Intersection, and Independent sets; and Gretchen Horlacher's 2000 analysis

explores the effects of superimposed meters. The common thread through all these

analyses is the presence of theorems, integers, nodes, and formal networks.[2]

The issue is not the formalism, but its overuse: somehow theorists have gone from

explaining Reich's music through networks and the like to saturating its compositional

representation with slight methodological nuance. Take Reich's well-known work

Clapping Music (1972) as an example and ask how you want it represented. Is your

interest in inherent syncopations and similarities with the West African Yoruba pattern?

Justin Colannino, Francisco Gómez and Godfried Toussaint cover this through a network

of phylogenetic graphs. Are you still not satisfied? Turn to Adolfo Maia Jr.'s similarity

measures using statistical analysis to quantify complexity. Not enough math? Joel Haack

tries to answer *Clapping Music*'s combinatorial problem. Perhaps you are satisfied at this

point but still want to inquire further. If so, then Jason Yust's recent analysis applies

discrete Fourier transform (DFT) to Reich's 3+2+1+2 rhythm, and though Yust's aim is

to describe the rhythmic qualities, it takes a lot of quantifying to achieve it.[3] In no way is

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[2] Richard Cohn, "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music" *Perspectives of New Music* 30/2 (1992), 146–77; Robert Antonio Saltini, "Structural Levels and Choice of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Intégral* 7 (1993), 149–78; Gretchen Horlacher, "Multiple Meters and Metrical Processes in the Music of Steve Reich, *Intégral* 14/15 (2000), 265–97. See also Ian Quinn, "Fuzzy Extensions to the Theory of Contour," *Music Theory Spectrum* 19/2 (1997), 232–63, and John Roeder, "Beat-Class Modulation in Steve Reich's Music," *Music Theory Spectrum* 25/2 (2003), 275–304.

[3] Justin Colannino, Francisco Gómez and Godfried Toussaint, "Analysis of Emergent Beat-Class Sets in Steve Reich's 'Clapping Music' and the Yoruba Bell Timeline," *Perspectives of New Music* 47/1 (2009), 111–34; Joel Haack, "Clapping Music–A

it my intention to disparage these authors and their outstanding, thorough research. My point is that with a substantial amount of literature aimed at approaching Reich's works with similar formal representations, it is likely to arrive at similar interpretations. As stated in the opening, coming up with novel formalist analyses of Reich's music, and even minimalist music in general, feels like reinventing the analytical wheel. Thus, a different approach to the same music would yield new insight and a wider array of interpretive results.

1.2 Referentialism

Referentialism focuses on describing the qualities of the work and its meaning by relying on extra-musical frameworks to ground the analysis itself. Such frameworks to apply in a referential analysis include psychoanalytic, semiotic, and narrative. Examples using such frameworks in minimalist music include analyses by David Schwarz, Joshua Banks Mailman, and Naomi Cumming.[4] Though speculation is more inherent in this approach, referentialism can conceivably have more diverse interpretations of the same work because of the diversity in frameworks. Although I have presented formalism and referentialism as contrasting approaches, it is important to note that one will always be

Combinatorial Problem," *The College Mathematics Journal* 22/3 (1991), 224–27; Adolfo Maia Jr., "Clapping Music: Complexity and Information in Reich's Rhythm Space," *Perspectives of New Music* 58/1 (2020), 91–121; Jason Yust, "Steve Reich's Signature Rhythm and an Introduction to Rhythmic Qualities," *Music Theory Spectrum* 43/1 (2021), 74–90.

[4] David Schwarz, "Listening Subjects: Semiotics, Psychoanalysis, and the Music of John Adams and Steve Reich," *Perspectives of New Music* 31/2 (1993), 24–56; Joshua Banks Mailman, Agency, Determinism, Focal Time Frames, and Processive Minimalist Music," in *Music and Narrative Since 1900*, edited by Michael L. Klein and Nicholas Reyland (Bloomington: Indiana University Press, 2013), 125–43; Naomi Cumming, "The Horrors of Identification: Reich's 'Different Trains,'" *Perspectives of New Music* 35/1 (1997), 129–52.

present and considered as secondary to better explain the primary approach.

My approach in this dissertation will be primarily referential with a particular focus on the signification in Reich's music. Aspects of the music will refer to things within the music or outside of it entirely. Rather than strictly focusing on the building blocks, my interest is how the subject—be it composer, listener, performer, or analyst—infers meaning to the work. Different types of meaning can be inferred depending on the approach taken. To further elaborate on such approaches, I will consider the following two hypothetical situations by Mariusz Kozak and Naomi Cumming that show opposing types of referentialism. Whereas both seek to infer meaning, specifically from the signifying factors of an object, Kozak does so in real time (temporal) and Cumming in the abstract (atemporal). These examples provide context to the reader in how to conceive the type of signification used in their approaches.

1.2.1 Kozak's rock-as-paperweight

In his recent book *Enacting Musical Time*, Mariusz Kozak explores how musical meaning is acquired in real time by a real, living subject. To give an example outside of music, Kozak presents the reader with a high school teacher, Mary, who is grading papers outside on a windy day:

> At first just a breeze, Mary realizes that an unexpected gust would send her papers flying into the air. Visually scanning the space around her, turning her head this way and that, and shifting her body's weight forward and back, she notices a rock, slightly larger than the size of her fist. She reaches out for it, and, feeling its heft, she deems it up to the task and places it atop the stack.[5]

In this scenario, the rock is deemed significant because, given the windy conditions of the

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[5] Mariusz Kozak, *Enacting Musical Time: The Bodily Experience of New Music* (New York: Oxford University Press, 2020), 43.

environment, Mary found that it suited her needs to weigh down the papers. The rock can take many forms of significance; as an example, Kozak cites its composition (i.e., mineral, chemical), a prominent feature for many objects. However, the type of rock, or even knowledge of past things that can be deemed a "rock," though perhaps relevant to Mary's understanding of the object situated before her, were not of concern to her. Instead, its size and weight solved the potential issue of her papers versus the weather at that moment in time.

With a previous (implied) knowledge of rocks, Mary knew that the specific rock was one that was applicable. In other words, she knew that she could "handle" the rock. For her, the object created an affordance to act upon. Like its tangible, commodified application, an affordance implies value and potential—we can afford something if we have the means and the desire to do so. For Kozak, tying affordance into general signification means that the value of an object is determined by a subject's interactions with its environment. This also means that things can present themselves as significant yet cannot afford to be. For example, a rock that was too big or too heavy could not be applicable (i.e., "affordable") to Mary and thus would be deemed insignificant for her in that moment.

Affordances inhere when a subsequent "system" is created by such an interaction. This system contains the body's perceptual and the self's social and cultural understandings. The bodily engagement allows the signification to manifest itself (for Kozak, the signification being time) through "a particular form" of experience known as enactment.[6] This leads Kozak to assert, "Affordances manifest in the actions that an

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[6] Ibid., 40.

organism performs in response to some aspect of its environment. Given this premise, significance is embodied, enacted, and situated."[7] Kozak's branch of referentialism thus operates at the level of the real, physical body in a realm of temporality he defines as "lived time." Like affordances, lived time is enacted and "only exists as part of the unfolding dynamical system that emerges between an embodied consciousness and the world."[8] Rather than qualifying events as occurring "before" and "after," a subject's positioning and enactment towards their environment presents a tense to their time: "past" and "present" are situated on a singular, linear understanding of time.

1.2.2 Cumming's kangaroo sign

This second approach to referentialism is atemporal and semiotic: it puts distance between the subject and the object of interest. This means that during (observing (outside)) the subject's inference of signification is an act of mediation between an object and its representation. This mediation is typically the act of interpreting. I will be taking this approach in this dissertation, and the following example from Naomi Cumming will show an extensive yet necessary overview of her methodology.

In her book, *The Sonic Self: Musical Subjectivity and Signification*, Cumming provides an example of a subject semiotically engaged with an object (i.e., engaged in the act of semiosis). She presents the reader with a road sign typically found in the Australian countryside. It is diamond-shaped and has a silhouette of a kangaroo (i.e., black in colour) with a reflective gold background. To uncover the signification behind this kangaroo sign, Cumming presents three main questions tied to semiotician Charles

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[7] Ibid., 48.
[8] Ibid., 34.

Sanders Peirce's three trichotomies of signs, which I will discuss in more detail following this section.

The first question is, "**What is doing the signifying here?**"[9] Of the attributes given, the one that grabs the driver's attention is the kangaroo silhouette. Cumming, in a first-person narrative voice, inquires further about the inherent qualities, the things that pertain to the sign "in itself":

> "[. . .] is it a singular thing, a unique occurrence?" "No," is the immediate reply, "it is a replica of the same shape used everywhere in the road system to convey 'kangaroo.' It would be uneconomical for the municipal authorities to exercise greater originality than that."[10]

In other words, is this presentation/depiction of a kangaroo a "one-off" occurrence? While citing governing bureaucracies, Cumming answers in the negative and explains that multiple presentations of the sign (i.e., different kangaroo silhouettes) would not be ideal when trying to convey the same message.

The second question concerns how the signified thing presented to the subject represents the "object" in question:

> The black silhouette conveys the idea "kangaroo" as its immediate object. **How does it do so?** By presenting a schematic likeness of some brute features of a kangaroo's shape (erect posture, long tail, large hind legs, small paws, ears pricked forwards). These features allow it to present "kangaroo" irrespective of whether any actual kangaroos happen to be in the area at the moment when the sign is noticed by a particular driver.[11]

The object, then, is a kangaroo. Further, in order to appropriately present the subject with something that directs them towards inferring a kangaroo, the shape of the silhouette is

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[9] Naomi Cumming, *The Sonic Self: Musical Subjectivity and Signification* (Bloomington: Indiana University Press, 2000), 80, emphasis added.
[10] Ibid., 81.
[11] Ibid, emphasis added.

that of a kangaroo. Cumming describes this as "the ground of signification, able to hold true quite apart from the position of the road sign in the countryside, or the existence of any real kangaroos."[12] Thus, in lieu of an actual kangaroo pinned to a sign, which would be morally reprehensible, presenting a shape conveying a likeness to a kangaroo suffices. Again, the same shape is used for all similar road signs.

Cumming's third question is, "**How should a driver then 'take' this sign?**"[13] This question not only addresses the driver in question, but also addresses others who could have a shared agreement in their taking of the same sign. In typical Peircean fashion,[14] Cumming posits three subsidiary questions: (1) Does the sign represent a possibility? (2) Does it point to a fact, which can be asserted as true? or (3) Should it be taken as pointing to a general rule?[15] Question (1), for Cumming, is the only one that can be answered in the affirmative. Like the first question (is this a "one-off") this subsidiary question addresses its occurrence:

> No particular kangaroo has to present itself in order for the road sign to convey its idea of possibility, through its own characteristic shape. It represents a "possible object," not a particular, factual occurrence. If, however, kangaroos on highway signs were no more than an invitation to bored drivers to contemplate the idea of possible kangaroos, they would be of little use. This way of "taking" the shape, as a primary signifying element, has missed its relationship to other aspects of the sign.[16]

The road sign represents a "possible object," meaning it is possible for a kangaroo to be in the vicinity and one does not need to present itself for it to convey this possibility.

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[12] Ibid.

[13] Ibid., emphasis added.

[14] By this, I mean how Peirce's semiotics works in threes. I will discuss this in more detail in the next section.

[15] Cumming 2000, 81.

[16] Ibid.

Thus far, we can surmise that the sign shows a representation of a kangaroo (silhouette in the likeness of it) with the intent to convey the possibility of kangaroos in the area. Furthermore, there is an understanding that there are other kangaroo signs like this elsewhere and this is just not a one-time occurrence of the sign itself. However, there are two attributes still left that have potential signification: its diamond shape and the reflective gold backing. Although the silhouette was favoured when addressing what is doing the signifying, the shape and colour still serve a crucial purpose when taking a sign as a whole.

The shape and colour of the kangaroo sign are the "vehicles" of the sign, which are defined by David Lidov as "the material phase of an external representamen."[17] The materiality of the kangaroo sign is given to the driver in physical form. In other words, the road sign is explicit.[18] Further, diamond-shaped, gold-coloured road signs in Australia have been conventionally established as attributes to warn drivers. Therefore, not only does the road sign signify the possibility of kangaroos in the area, but it also warns the driver to be alert. Rather than convey a message such as, "enjoy the possible sighting of kangaroos in the area," the vehicles of this road sign convey the message, "be cautiously on the lookout for kangaroos in the area."

Having discussed its presentation and purpose, the last consideration is its position. Cumming explains:

> The expected behavior of drivers in the "bush" does not depend only on recognizing the kangaroo icon, and contemplating kangaroos as an abstract possibility, but on noticing the sign's position. The recurrent appearance of such

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[17] David Lidov, *Elements of Semiotics* (New York: St. Martin's Press, 1999), 105.
[18] Implicit representamen exist and their material phases are known as "images" (Ibid.). Implicit road signs, where one would have to imagine all the warnings, laws, codes, etc. while driving, would cause absolute chaos.

signs at moments of entry into forest suggests that drivers might slow down (especially if driving at night) and thus avoid colliding with the animals. The message is "(possible) kangaroos *ahead*" not "think of a generic kangaroo now!" The sign's position indexes a location where kangaroos are known to appear, and requires a response as if the object were a fact.[19]

Due to laws stipulated by the municipal authorities, it is expected for drivers to adapt their behaviour according to the road sign's placement and message. This adaptation is done through acts of semiosis.

1.3 Semiotics

The inquiries from Cumming's referential approach (i.e., what makes something meaningful) are explained through semiotics, which, broadly speaking, is the study of signs and signification. To deem an object significant is not simply to deem it meaningful, but rather to inquire how the object is represented (i.e., signified), who or what does the representing, and consequently create signification from such a representation.

My approach to musical gesture led me to use Charles Sanders Peirce's branch of semiotics when analyzing signification. Peircean semiotics works in threes: there is an overarching triad of signification as well as three different categorical trichotomies, consisting of three signs within each trichotomy. The triad of signification includes a Representamen, Object, and Interpretant.[20] Peirce explains, "A *Sign*, or *Representamen*, is a First which stands in such a genuine triadic relation to a Second, called its *Object*, as to be capable of determining a Third, called its *Interpretant*, to assume the same triadic

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[19] Cumming 2000, 82, emphasis in original.

[20] These labels are capitalized in the context of the triad, but they can also be lowercase.

relation to its Object in which it stands itself to the same Object."[21] In other words, a Sign or Representamen represents or signifies an Object, leading a subject to create an Interpretation. The mediated act of interpreting a signified object is unique to Peircean semiotics. Along with Peirce, Ferdinand de Saussure's branch of semiotics has been adapted for music-analytic purposes.[22] Broadly speaking, rather than conceiving of the semiosis in three parts, Saussure uses a two-part, signifier-signified framework. In his book on markedness in Beethoven, Robert Hatten explains three advantages Peirce has compared to Saussure. First, conceiving in threes "avoids a behavioristic (stimulus and response) reduction of the relation between vehicle and meaning." Second, having the added interpretant rather than a signifier-signified dichotomy "promotes greater attention toward the way a sign is 'meant to be taken' or toward meaning as 'meaning-for' someone."[23] This is evident in Cumming's third line of questioning from the previous section. Finally, interlinking interpretants through semiosis "avoids the simplistic or mechanical one-to-one mapping of a rudimentary code."[24] In sum, factoring in interpretation with Peircean semiotics, without its reliance on linguistics, allows for more subjective influence rather than Saussure's signifier-signified branch of semiotics.

Peirce's representamen can be categorically labeled as one of nine individual signs, which are grouped together in three trichotomies. The first trichotomy consists of a

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[21] Charles Sanders Peirce, *The Philosophy of Peirce: Selected Writings*, edited by Justus Buchler (London: Kegan Paul, 1940), 99–100.

[22] See Kofi Agawu, *Playing with Signs: A Semiotic Interpretation of Classic Music* (Princeton: Princeton University Press, 1991). Further, Jean-Jacques Nattiez, Raymond Monelle, and Eero Tarasti are known for their work in music semiology.

[23] Robert S. Hatten, *Musical Meaning in Beethoven: Markedness, Correlation, and Interpretation* (Bloomington: Indiana University Press, 1994), 244.

[24] Ibid.

qualisign, sinsign (singular sign), and legisign; the second trichotomy consists of an icon, index, and symbol; and the third trichotomy consists of a rheme, dicent (dicisign), and argument. As discussed above, Cumming was implicitly putting the three trichotomies to work in her lines of questioning. Each broad question had three different options, the third one being the most explicit in this regard. The third question produced three subsidiary questions, each one applying to the signs in Peirce's third trichotomy of rheme, dicent, and argument. Cumming concludes that the road sign was rhematic, a sign meant to show possibility.

Depending on the inquiries of the subject and the context of the object, typically one representata from each trichotomy is applied to the object. This does not mean objects are limited to a single sign from the same trichotomy. For example, Cumming describes the kangaroo sign not to just be exhibiting a likeness to a kangaroo (icon), but also as directing a driver's attention (index).[25] To designate one sign from each trichotomy will depend on the aspects of the object that the interpreter is interested in. Its presentation and purpose, which is addressed in the three broad questions, brings Cumming to conclude that the kangaroo sign contains the representamen of legisign, icon, and rheme. Finally, Cumming's scenario shows how semiotics studies the aspects of things around us that are seemingly obvious. In other words, one does not have to always think about "things" being signified because one's culturally embedded intuitions do the work already. However, new meanings and perspectives can emerge when bringing attention towards "the obvious."

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[25] Cumming 2000, 81.

Figure 1.1 shows a table from Chapter 3 in Cumming's book on the broad lines of questioning previously mentioned as well as the signs pertaining to each one.[26] My dissertation will primarily make use of Peirce's second trichotomy, which creates connections between the object and its representation.

Figure 1.1 Cumming's questions on Peirce's three trichotomies of signs.

Table 3.4. **Bringing the questions together**			
	First	**Second**	**Third**
What is the item that represents, taken alone? (Representamen)	*Qualisign* A quality, colour, timbre.	*Singular Sign* a) An individually occurring item or event; b) a token of a type	*Legisign* A conventional representation; a type.
What is the ground of signification? What connects the Representamen and its Object?	*Icon* a) An aspect of the presentational form giving rise to: b) A putative likeness to some object (either naturally' or by convention.	*Index* A 'causal' or directional connection to the object, established by context.	*Symbol* A conventionally stipulated relation (as in most words), requiring knowledge of the convention for its interpretation
How is the sign to be "taken"? (How does the sign look from the point of view of an interpretant?)	*Rheme (rhematic sign)* The sign of a possibility.	*Dicent (Dicisign)* The sign of an actual occurrence.	*Argument* The sign of a set of conventions.

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[26] Ibid., 97.

From this semiotic, atemporal perspective, Kozak asserts, "An approach that regards the intimate link between performer and listener as a mediating illusion—one that listens to the piece, as it were, from the comfortable distance of semiosis—would not create a sufficiently rewarding listening experience."[27] Rather than an intimate link between performer and listener, which is still important, the link between the work and reader needs addressing. The work-reader link can infer signification; for my purposes, this will be established through a semiotically grounded theory of musical gesture. In other words, the analytic mediation comes not from its enactment in real (lived) time, but from observing and understanding the music, which leads to engaging with it. Thus, the act of understanding must be addressed before moving towards real-time engagement.

I believe this is the central problem in current music-theoretical scholarship on Reich. Given the aforementioned over-saturation of formalist approaches, the analyst—and, consequently, the reader, listener, and performer—has overlooked what is significant (i.e., what elements of the music signify its development) and therefore has misunderstood what Reich is trying to convey. Semiotics will greatly help in this regard because minimalist music brings attention to the absence of many musical ideas in favour of simpler ones. Thus, like semiotics, approaching minimalist music can seem like approaching "the obvious," yet there is still a great amount of signification yet to be uncovered. Through subjective interpretations of Reich's works, this dissertation aims to fill in the missing gap of preliminary understanding and thus opens up Reich's music, and other minimalist music, to more approaches of the same type.

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[27] Kozak 2020, 22.

1.4 Chapter Summaries

My analyses will determine what represents the music, either as a whole or through specific attributes, such that material (musical object: process, pattern, analytical labels) can be deemed significant. Deeming attributes of the music to be gestural, and thus significant, will offer better understanding to what underlies minimalist music. Three body chapters, 2–4, cover different periods of Reich's compositional development. Each one aligns with Timothy Johnson's three descriptors to help qualify minimalist music: an aesthetic, a style, and a technique.[28]

Chapter 2 examines gesture in Reich's process music. This music falls under Johnson's minimalist aesthetic, which is primarily concerned with the "development of new listening strategies in order to fully appreciate the works."[29] Elaborating upon Jonathan Bernard's critique of analyzing minimalist music, I discuss how the apparent design of process itself is so straightforward that Reich's music of the 1960s has been mischaracterized as static, directionless, hypnotic, and inherently objective music. Much of this has to do with an underlying feature of process music, namely, form and content are fused together, continuously informing one another. Rather than one musical element being conceived as the object of gestural interpretation, process itself is signified. Because process is self-referential, its representation lies in the sound. When the sound (representamen) represents process (object), gesture emerges (interpretant). The sound can be further qualified as semiotic icons, or signs that exhibit a likeness to its object. Thus, the sound exhibits a likeness to process itself. The one to identify such likeness and

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[28] Timothy A. Johnson, "Minimalism: Aesthetic, Style, or Technique?," *The Musical Quarterly* 78/4 (1994), 742–73.

[29] Ibid., 745.

subsequently gestural emergence is not the performer, who is usually the one to infer

gesture, but the listener. A listening subject who adopts attentive awareness, a term by

Cumming which involves a listener being attentive towards the sound and its quality, can

interpret the sound as gestural. How the sound is likened to process will be explored in

my analyses of *Melodica* (1966), *Pendulum Music* (1968), and *Four Organs* (1970).

Chapter 3 examines gesture in what I call Reich's "stylistic" works of the 1970s,

spanning from *Drumming* (1970–1971) to *Music for 18 Musicians* (1974–76). These

works fall under Johnson's minimalist style. Elaborating on Robert Pascall's definition of

musical style, these minimalist works develop formally, texturally, harmonically,

melodically, and rhythmically.[30] Along with bigger ensembles, an emphasis on acoustic

instruments, and longer works that separate form and content, the most significant change

in Reich's stylistic works was the pattern. Though patterns were present in his process

works, the patterns in Reich's stylistic works were longer, more salient, and they were

employed such that they could be stacked, built up, and indexed. The stronger focus on

the pattern can be attributed to Reich's exposure to non-Western music. According to

Reich, having studied A.M. Jones's works on West African music and going to Ghana in

1971, the influence—or, in his words, the confirmation of what he was doing before—

comes through in the sound.[31] While noting that Reich is "deeply aware of the ethical and

aesthetical issues involved" in his encounters with non-Western music, Kofi Agawu

explains that the composer's use of African patterns, known as time lines, "support a

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[30] Robert Pascall, "Style," *Grove Music Online* (2001),
<https://doi.org/10.1093/gmo/9781561592630.article.27041>.

[31] Steve Reich, *Writings on Music: 1965–2000*, edited by Paul Hillier (New York: Oxford University Press, 2002), 67.

mode of expression that is listener oriented and composer centered" rather than applied to the more traditional dance use in West African music.[32]

This chapter also discusses performance practice in Reich's music, primarily citing Russell Hartenberger's scholarship on the subject. Hartenberger, an original member of Steve Reich and Musicians, considers two performative elements to be crucial in performing Reich's works. The first, and arguably most important element, is even, unaccented attacks. Such consistency allows for more rhythmic ambiguity, consequently creating more interpretive possibilities for the listener. The second is the physiological awareness of the performer. Hartenberger discusses being so comfortable with the patterns to the point of detaching himself from the physical action and at the same time concentrating on interlocking with other parts.[33] The combination of consistent attacks and physiological detachment allows players to hear the patterns and appropriately communicate and execute the material. These elements will be covered in analyses of *Music for Pieces of Wood* (1973) and *Drumming*.

Chapter 4 focuses on Reich's postminimalist works in the 1980s. These works are equated to Johnson's minimalist technique, which extends the five stylistic attributes and "[allows] the affinities between related pieces to be recognized."[34] *Music for 18 Musicians* marked the culmination of Reich's compositional development up to his postminimalist period. Following this, much of Reich's techniques become codified and would be seen in multiple works. Reich's early postminimalist works such as *The Desert*

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[32] Kofi Agawu, *The African Imagination in Music* (New York: Oxford University Press, 2016), 322.

[33] Russell Hartenberger, *Performance Practice in the Music of Steve Reich* (New York: Cambridge University Press, 2016), 32.

[34] Johnson 1994, 751.

Music (1983), the *Counterpoint* works (1982, 1985, 1987), and *Different Trains* (1988) share several compositional attributes, including a dynamic swell gesture, contrapuntal organization, and build-ups. The gestures in these chapters are represented by symbols, defined by Lidov as "an articulate arrangement of articulated materials, that is, the relations of arrangement as well as the materials are abstract types."[35] Further, the symbol is the "furthest removed from the body," meaning that its inference lies not in its physical likeness or an indicated response, like the icon and index do respectively, but from an outside conventional source, be it a law, convention, or rule.[36] Identifying symbolic gestures is a component of this chapter, but not the main focus. Whereas the listener and the performer were the subjects of interest in Chapters 2 and 3 respectively, the analyst is the subject of Chapter 4. Thus, the focus of this chapter is on previous analytical representations of Reich's postminimalist works, and the goal is to reinterpret formalist analyses by John Roeder and Ian Quinn on a meta-theoretical level to show the efficacy of a referential perspective.

Finally, Chapter 5 serves as the conclusion of the dissertation. First, I review how I applied musical gesture to Reich's music spanning from his process works of the 1960s to his postminimalist works of the 1980s. Next, I discuss how my findings potentially impact the music-theoretical scholarship on minimalist music and semiotics. Finally, I consider future applications of my research to music of other composers and by other referential means as well as suggest avenues for research that are of potential interest to the reader.

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[35] David Lidov, "Mind and Body in Music," *Semiotica* 66 1/3 (1987), 73.
[36] Ibid.

Chapter 2

The Minimalist Aesthetic: Gesture in Reich's Process Music

"A process cannot be understood by stopping it. Understanding must move with the flow of process, must join it and flow with it."

The First Law of Mentat
Frank Herbert, *Dune* (1965)

Contrary to the avant-garde composers in the 1950s and early 1960s wanting complete control of the music, minimalists pursued an opposite objective: deterministic, autonomous works generated through a process involving repetition and gradual shifts. In his 1968 seminal essay, "Music as a Gradual Process," Steve Reich defines slow and gradual process as an audible and perceptible phenomenon, predetermined in construction, synthesizing form and content, and rejecting improvisatory actions and/or events. The composer of process music has personal control over a process (referred to by Reich as "*it*") by the act of simply establishing its parameters and letting it play out. This "playing out" subsequently relinquishes control of the process to the listener, and this control is exerted through the perception and recognition of minute details within the overall process. Therefore, the listener's undivided attention invites participation into the process's own construction.

Steve Reich ends his essay by stating that a gradual musical process can make the listener participate "in a particular liberating and impersonal kind of ritual."[37] Even the mentats, a hyper-intellectual order of Imperial citizens in Frank Herbert's science fiction novel *Dune*, understand that process itself requires a participatory role of joining and

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[37] Steve Reich, *Writings on Music: 1965–2000*, edited by Paul Hillier (New York: Oxford University Press, 2002), 36. The essay was initially published in *Anti Illusion: Procedures/Materials* (New York: Whitney Mus. Amer. Art, 1969), 56–57.

moving with a "flow" of process—an idea so compelling to them that it is codified as law in Herbert's fictional universe. Whereas Reich and other scholars suggest that the listener passively engages in process music (i.e., in an impersonal manner), I believe that a deeper understanding of process music is achieved through active participation. This subsequently implies the likeness of musical qualities as atemporally and indirectly related to the qualities of process. In other words, active participation invites the listener to interpret musical events as significant, subsequently creating gestural interpretations within the music. Developing new listening strategies to better engage with the musical process is one of the defining features in Timothy Johnson's "minimalist aesthetic."[38]

This chapter explores how gesture is realized, identified, and confirmed in Steve Reich's process music by discussing gesture through both a semiotic lens and a stylistic lens. The semiotic identification explores how a listener interprets the sounds in process music to represent process itself. I will show how the listener infers meaning in process music through actively participating in the music using Naomi Cumming's concept of "attentive awareness."[39] Peircean semiotics will further explain how an attentive listener can infer gesture from sound's iconic representation of process.

The stylistic identification of gesture discusses how process music creates perceptually salient events based on Reich's compositional style. Robert Hatten discusses this in detail in his book on musical gestures in common-practice music.[40] Although

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[38] Timothy A. Johnson, "Minimalism: Aesthetic, Style, or Technique?," *The Musical Quarterly* 78/4 (1994), 745.

[39] Naomi Cumming, *The Sonic Self: Musical Subjectivity and Signification* (Bloomington: Indiana University Press, 2000), 61.

[40] Robert Hatten, *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert* (Bloomington: Indiana University Press, 2004).

Hatten's original application of gesture is centered toward the music of Mozart, Beethoven, and Schubert, this chapter explores musical gesture in Reich's early works. Hatten's theory moves from the structural components of gesture to the typology of topics and tropes through stylistic consideration and strategic compositional intention. Both semiotic and stylistic perspectives of gestural identification will lay the groundwork in how to approach Reich's music following his process works.

2.1 Process Music

Rather than write an entire historical overview of the shift from the music of the abstract expressionist composers—particularly John Cage, Morton Feldman, and George Brecht—into the early minimalist works, I will discuss two writings: "Changes" by Cage—one of his three "Composition as Process" lectures from 1958—and Reich's "Music as a Gradual Process." This section explores how each composer addresses their compositional processes, with Reich moving away from indeterminacy and chance operations and onto a style of composing that drastically differed from Cage's.

2.1.1 Composer and determinacy

"Changes" discusses Cage's compositional changes that spanned over a decade, citing works from *Construction in Metal* (1939) to *Music for Piano* (1953).[41] The "compositional activity" of his early music, with the former *Construction* as an example, was the integration of the rational order of the mind, made up of structure, method, and material, and the irrational spontaneous actions of the heart, made up of method, material, and form.[42] Cage's perspectives on structure and method affected his approach to

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[41] Other works bearing the title *Music for Piano* were written until 1962.
[42] John Cage, *Silence: Lectures and Writings* (Middletown, CT: Wesleyan University Press, 1961), 18.

composition, and what began as a dichotomy between the opposing mind and heart, the

rational and irrational, shifted from works determined by structural processes to works

determined by indeterminate chance operations.

The structure, which involved dividing the work into parts, was the deciding

factor of the beginnings and endings of his early compositions. However, Cage realized

that indeterminate methods could determine the structure rather than a predetermined

division of parts. Consequently, structure was foregone in *Music for Piano* and

subsequent works. Cage elaborates:

> It became clear, therefore, I repeat, that structure was not necessary. And, in
> *Music for Piano*, and subsequent pieces, indeed, structure is no longer a part of
> the composition means. The view taken is not an activity the purpose of which is
> to integrate the opposites, but rather of an activity characterized by process and
> essentially purposeless.[43]

For Cage, method involved the note-to-note procedures in his music, or, how the music

progressed.[44] Thus, the methodological "how" determined the structural "what" in his

compositions. However, the indeterminacy of his chance compositions was determinate.

Chance operations, indeterminate in quality, can in fact determine how the piece begins

and ends. As much as Cage resisted structure, predetermined beginnings and endings

were inescapable. That was the compositional process, the means that which influence

the result, that Cage moved towards in *Music for Piano* and other subsequent works.

Thus, the compositional process in his works following *Music for Piano* is indeterminate

in method via chance operations. Further, the structural design shifted from qualifying its

organization of the work to qualifying the organization of sounds.

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[43] Ibid., 22.
[44] Ibid., 18.

Whereas Cage's works served as a reflection of the composer, Reich's process music served as a reflection of process itself. To quote Reich's first sentence of "Music as a Gradual Process," "I do not mean the process of the composition but rather pieces of music that are, literally, processes."[45] For Reich's process music, structure was predetermined by his choice in process, which was always a literal process musically realized. The method of executing Reich's processes began with tape and later with live musicians. The most important difference between the processes in Reich's music and Cage's is that Reich's process is audible. Reich wants the listener to hear the gradual process in motion. K. Robert Schwarz, in describing the "inventio" of Reich's composing, surmises that "it is only in the working out of the musical processes that [Reich's] personal statement becomes evident."[46] The process in process music is worked out beforehand and then realized in performance. In Reich's words, "once the process is set up and loaded it runs by itself."[47] Both composers relied on a type of determinacy to execute the processes in their works: Cage relied on indeterminate methods and Reich relied on predetermined structures. The former resulted in a compositional process determined by chance operations, and the latter resulted in compositions employing audible processes.

2.1.2 Form and content

The predetermined structures and objective performative execution of Reich's process music suggested form and content have a novel relationship not seen in Western

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[45] Reich 2002, 34.
[46] K. Robert Schwarz, "Steve Reich: Music as a Gradual Process: Part I," *Perspectives of New Music* 19/1–2 (1980), 379.
[47] Reich 2002, 34.

music. According to him, "Material may suggest what sort of process it should be run through (i.e., content suggests form), and processes may suggest what sort of material should be run through them (i.e., form suggests content)."[48] Material is prescribed in order to describe process, and, at the same time, process is prescribed in order to describe material. The result of this is a style of music where form and content continuously inform one another.

Because of this fusion, process music does not contain any hidden compositional devices. Reich informally describes this as having "all the cards on the table."[49] Any irregularities stem from the perceptions of the listener:

> The use of hidden structural devices in music never appealed to me. Even when all the cards are on the table and everyone hears what is gradually happening in a musical process, there are still enough mysteries to satisfy all. These mysteries are the impersonal, unintended, psychoacoustic by-products of the intended process. These might include submelodies heard within repeated melodic patterns, stereophonic effects due to listener location, slight irregularities in performance, harmonics, difference tones, and so on.[50]

Compositional mysteries, contrary to hidden compositional devices, can exist in this music. Whereas their existence might draw the attention of the listener, Reich's intention remains the same: wanting listeners to be aware of the process. Semiotically, the qualities within the intended process will emerge from the music as gestural, and such qualities result from Reich's intended compositional techniques.

2.1.3 Reich and phase-as-process

In his process music, Reich employs two techniques to convey process: phasing (or phase) and augmentation. Because phase was Reich's compositional breakthrough, I

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[48] Ibid.
[49] Ibid., 35.
[50] Ibid.

will discuss it in detail, including its employment through tape and by live performers.

Reich's augmentation procedure will be explained analytically later in this chapter. The

act of phasing involves a minimum of two voices or parts beginning in unison. One of the

parts acts as a constant that maintains the original unison pattern: a set pattern of beats

and rests or, in the case of his spoken-word tape compositions, a small piece of dialogue

with inherent rhythmic inflections. The other part moves forward incrementally to arrive

at a rhythmically transposed version of the initial unison pattern. Said transpositions

almost always operate by shifting one note or beat ahead of the previous pattern. This

new pattern is known as a phase relationship, or a composite pattern.[51] The result is a

complex, quasi-polyphonic canon of multiple, overlapping simultaneities. This

compositional technique can be conceptualized formally as orbital in nature, where a

constant voice is juxtaposed against an orbital voice. First there is a beginning "unison,"

implying that there are two voices, at minimum, present at the same points in time.[52] In

the context of the listener of Reich's tape works *It's Gonna Rain* (1965) and *Come Out*

(1966), this will mean hearing "it's gonna rain" or "come out to show them,"

respectively, without any shifts or deviations. As the shifts occur over time, there will be

an exact point where the orbital voice will be at the furthest distance away from the

constant. The listener will hear consecutive iterations of the text without any overlap

(e.g., "it's gonna rain – it's gonna rain"; "come out to show them – come out to show

them"). The completion is heard as a "unison," one that had to undergo change through

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[51] Unison and composite patterns are adopted from Russel Hartenberger of Nexus
Percussion, an original member of Steve Reich and Musicians. See Russell Hartenberger,
Performance Practice in the Music of Steve Reich (New York: Cambridge University
Press, 2016).
[52] Reich's *Come Out* (1966) moves from two, to four, and finally to eight phasing voices.

phase to get to its final destination.

The ending or completion of these tape works is important in understanding a type of narrative in Reich's early use of phase. With time as an agent, the shifting part always moves forward. However, after achieving the complete cycle of arriving at a second unison at the end of the work, one might assume that this is done by the second voice simply returning. In other words, the second voice moves forward by going back. Although the music starts to create simultaneities following the "halfway point," the shifting pattern creates new simultaneities, not exact repetitions or reiterations of previous material. Therefore, the cycle is achieved by the orbital voice always speeding up until there is a point of opposition moving toward a point of unison. Using implicit, unfixed time, phase in Reich's tape works marked his first significant compositional technique that exemplified how a slow and gradual process can be realized musically.

Reich further developed phase by moving from the use of tape to live instrumental music. *Piano Phase* (1967) was Reich's first work played by live musicians. Like the tape works, *Piano Phase* has two musicians each with a part: one is assigned to be the constant and the other incrementally shifts forward. The difference is that Reich must make explicit instructions for time to be a reference. The second performer must move in approximate time points to move a sixteenth note ahead to create its offsets. The beginning six measures of *Piano Phase*, provided in Example 2.1, references Reich's specifications.

Example 2.1 Steve Reich, *Piano Phase*, mm. 1–6.

2.1.4 Misconceptions

The novelty of Reich's process music stems from fusing content and form, further qualifying it as self-referential. Subsequently, there are several misconceptions that have been attributed to process music and to minimalist music in general. I outline four misconceptions pertaining to process music that directly affect the listener's experience. The first misconception is the conflation of Reich's musical process to process music as a whole. In his book on minimalist music, Wim Mertens asserts:

> American repetitive music is an objective music in that, since no physiological tension is created, there is an ambiguous relationship with the listener. The music exists for itself and has nothing to do with the subjectivity of the listener.[53]

If one were to take process music as existing for itself, offering no subjective input in its signification, then it would certainly be objective if left on its own. Thus, whereas process itself is objective, process music has everything to do with the subjectivity of a listener as long as they understand and engage with the musical process. This will be discussed later in the chapter.

Subjectivities can be found in every work and process music is no exception. As I discussed earlier, Reich specifically makes this distinction in what is intended and not intended in process music. He intends for the process to be a process: it is impersonal, predetermined, self-referential, and, above all, audible. However, this does not take away from the fact that musical mysteries are inevitable. What Reich avoids are prescribed, intentional mysteries planted within the music because Reich believes there is nothing mysterious about that and his listeners must be aware of this.

The second misconception is Elaine Broad's claim of a complete absence of

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[53] Wim Mertens, *American Minimal Music* (London: Kirk & Averill, 1983), 90.

directionality in minimalist music that consequently defaults one to a passive mode of listening. Elaborating on Mertens's assertion of the lack of physiological tension, Broad explains, "In one sense the listener is only a witness to the process in a passive way; yet, because the music is without directionality, this allows him/her room for *personal experiential interpretation*."[54] First, if the listener is only passively involved, then all of the misconceptions that I discuss will hold up as true. Second, every listening experience will have personal implications whether the listener is active or passive in their listening. However, because process music is self-referential, directionality of the process that guides the music has nothing to do with the listener's experience; the process will be realized regardless, reflected musically as the work progresses and reaches its end. As Reich claims, the process is "set up" and then "runs by itself."[55] There is direction to that, albeit very minimal by design. However, the scarcity of materials is the entire compositional point in minimalist music; it is a feature, not a flaw. The work running by itself is the directionality, and the listener must be attentive to this.

With a combination of no physiological tension and lack of directionality, along with the compositional use of repetition and very slow rhythmic and harmonic movement, one can misconceive minimalist music to be static. Jonathan Bernard describes it as a myth, saying that to hear minimalist music as static "is to take at face value, and therefore rather superficially, the facts of extensive use of literal repetition and of the stringent limits placed upon the total repertoire of material."[56] Again, the limits

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[54] Elaine Broad, "A New X? An Examination of the Aesthetic Foundations of Early Minimalism," *Music Theory Forum* 5 (1990), 60, emphasis in original.
[55] Reich 2002, 34.
[56] Jonathan W. Bernard, "Theory, Analysis, and the 'Problem' of Minimal Music," in *Concert Music, Rock, and Jazz since 1945: Essays and Analytical Studies*, edited by

made are the use of such few compositional materials. There is a goal in mind, for the

musically realized process to be executed, and composers like Reich accomplish this in a

slow and gradual way. Therefore, for it to be slow and gradual, there must be devices

such as repetition and slow rhythmic and harmonic movement.[57] One who claims

minimalist music is static is not paying sufficient attention or does not understand the

means by which the work is performed. That said, a slow and gradual process can build

anticipation if the listener remains active. For example, one who listens to *Piano Phase*

with a knowledge of how phase works can feel the anticipation of the music moving

away from a composite pattern and into phase. This anticipation subsequently creates

tension in the process.

The fourth misconception concerns how time is affected by the listener's

experience. Bernard describes a type of accusation that minimalist composers write a

type of "trance music," using aural tricks "designed to confound ordinarily attentive

ears."[58] With Reich claiming his process music contains no intentional mysteries, it

would be illogical to suggest that he composed with the intention of tricking his listeners.

However, Reich has no control over the listener's reaction to the aural effects process

music produces. Therefore, there is the possibility of process music's effects embodying

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Elizabeth West Marvin and Richard Hermann (New York: University of Rochester Press, 1995), 262.

[57] This is contrary to Lewis Rowell's first "law" of musical stasis, "ostinato repetition," which he defines as stasis motivated by "continuous 'loops' of sound" which "dominate the musical activity and fill one's field of hearing." Lewis Rowell, "Stasis in music," *Semiotica* 66/1 (1987)186.

[58] Bernard 1995, 263. Eero Tarasti shares a similar sentiment by describing some process music to be "psychological tests expanded to Kafkaesque proportions, whose innocent objects the listeners are forced to be." Eero Tarasti, *A Theory of Musical Semiotics* (Bloomington: Indiana University Press, 1994), 281.

aural tricks or psychological tests. The scholars that suggest process music is trance music might also suggest that is the only way process music is presented. However, if one conceptualizes the music as a subject, they may find that there are alternative ways process music can be presented.

Furthermore, the assertion that a listener can feel "out of time" while listening to minimalist music, thus creating the sensation of trance music, seems dubious. Time can certainly feel different in different listening contexts. For example, due to the listener's familiarity with the music, one passage of phase might feel longer in one place than it does in another. However, the listener will know that phasing helps transition from one event to the next, and expecting the next event to arrive (i.e., a new composite pattern) will ground the listener's concept of time. Therefore, the assertion that aural tricks are used to "confound ordinarily attentive ears" is moot because minimalist music requires attentive listeners to participate.[59] As long as the listener understands the process and is attentive to it, then they would not register the processes as aural tricks.

2.2 The Listener

Process music presents a potential dilemma in its inference of gestures. The most common function of gesture is a communicative one, and the most common subject to musically communicate a gesture is the performer. However, performers of process music should be in service to the process. Any inflections, articulations, or somatic events will come from the process inherently, not from the performer. Thus, regardless of the medium, performative actions in process music cannot infer signification. There are no

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[59] Bernard 1995, 263.

specific moments the performer can indicate where they believe gesture to be located, which subsequently means the process can remain autonomous.[60]

Therefore, because the performer's function is to realize Reich's intentions rather than express personal nuances in process music, the listener is the sole arbiter of gestural inference. In this section, I explain how a listener can confirm and qualify these qualities given their inherent perceptual faculties of intuition, consciousness, and introspection. After discussing these qualities, I turn my attention to a type of listening strategy involving active participation from the listener.

2.2.1 Defining a listening subject

There is not one universal listener. Every person will approach a piece of music with different biases and prejudices derived from their own experiences, education, preferences, and so on. The only universal quality listeners share is that they are all different. However, there are caveats to consider for a shared experience to be possible. Specifically, three perceptual faculties most humans possess—intuition, consciousness, and introspection—can wildly vary in any individual. These faculties are in part what make a listener a subjective subject.

2.2.1.1 Intuition

Intuition is a type of knowledge characterized by the immediate cognitive process involved. Thus, the concept of intuition can seem effortless. For example, our cognition of an object is intuitive when our understanding of it feels engrained in us. This has led

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[60] The only exception, and perhaps even an anomaly, is *Violin Phase* (1967), where Reich instructs the violinist to inflect certain rhythms within a composite pattern (i.e., played separately, not emphasized through accents). This is known as a resulting pattern. This technique will be discussed in detail in Chapter 3, during the period in which Reich uses it the most.

Peirce to believe that "we seem to *feel*" that we have intuition, thus the "immediate"

feeling of having intuition is itself a mediate cognition as determined by one or more

cognitions.[61] This suggests that intuition is associated with cognitions outside of our own

inherent cognitions.

However, our intuition is a product of constant exposure to different experiences,

education, and stimuli over time. The more adept we are to experiences, the more adept

the cognitions feel to us and subsequently manifest in our actions. In other words,

exposure builds up our understanding of things into cognitions that can ultimately lead to

actions involving previous cognitions being "instinctive" in quality. The same can be said

with learned knowledge. One exploring a new subject, for example, will have a better

grasp of the material from the outset if they have some familiarity stemming from similar

subjects.

Musically speaking, Naomi Cumming defines the listening subject's intuition as

"the learned capacity to make discriminations of sounds and its signification."[62] The

learned capacity of musical intuition, again, stems from constant exposure over time. For

example, a professional clarinetist might listen to a piece they have not heard before but

still might be able to identify whether the clarinetist in the recording is playing a Bb

clarinet or an A clarinet due to each instrument's differing qualities (e.g., timbre, range,

fingerings, etc.). The ability to identify such things is not a purely innate quality. It is

something that is developed over time to the point in which the actions that seem intuitive

come to feel innate.

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[61] Charles Sanders Peirce, "Questions concerning certain Faculties claimed for Man," *The Journal of Speculative Philosophy* 2/2 (1868), 103, emphasis in original.
[62] Cumming 2000, 55.

2.2.1.2 Self-consciousness

One's consciousness reflects reactions to objects to which they have or have not had exposure. We are most self-conscious with an object, cognition, or experience with which we have less familiarity. Such objects call upon one to consciously make sense of it through familiar means. Cumming explains as such:

> A failure to encompass some experience in familiar terms, or adequately to predict it, leads to a knowledge of the "self" as one who is over-against something (or someone) in the environment. The "self" becomes apparent as one who had a will to organize things in a way known to it, that will being drawn to attention only by being resisted.[63]

Thus, in unfamiliar circumstances, we rely on familiar circumstances to interpret the unfamiliarity, rationalize the unfamiliar into something familiar, and effectively learn more about ourselves in the experience. Cumming notes that such actions taken come from a "will" of the self, which becomes apparent by unfamiliar circumstances creating resistance. Self-conscious behaviors manifest when one acts upon this will.

Cumming also notes that experiences become intelligible when they are directed towards an object. When listening to process music, for example, the listening subject must be conscious of the process for it to be an intelligible experience. A potential issue can arise when the listener accepts the default control that the composer has in the process but does not consciously engage with the process at work, as was discussed previously. This is an unintelligible experience because the listener is not directing their attention towards the object. Consciousness, therefore, plays a critical role in the type of awareness and engagement directed towards music, which will be discussed in detail later.

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[63] Ibid., 56–57.

2.2.1.3 Introspection

Introspection, according to Peirce, is "a direct perception of the internal world, but not necessarily a perception of it *as* internal."[64] One's internal world is filled with content derived from the external. Introspection is thus the act of inferring external facts in internal cognitions, perceptions, etc. Like intuition, introspection relies upon previous experiences and knowledge gained. We use introspection to derive content from our self-consciousness, which is informed by our external world.

As with the lack of consciousness towards an object, the opposite can also occur where the listening subject mostly relies on their own cognitions when experiencing the process. Cumming explains the problem of an introspective analysis:

> It would, however, be mistaken to pursue an analysis introspectively, seeking to discern the difference between varying degrees of felt strangeness, as if they could be recognized independently of attention to the musical effects that bring them about. The danger in doing this would be to fall back on the presumption of an intuitive capacity to distinguish one's own state of consciousness, apart from their objects.[65]

The subject, in this case, the analyst, can possibly alter their own perception because of the reliance on their intuition, or cognitions determined by other cognitions, to determine the inference of an external object. This results in inferences that are inherently biased. A listening subject must maintain a balance when interacting with an object. Too much introspection leads to loss of consciousness toward the object and therefore loss of attention. For example, when listening to process music, one might be inclined to occasionally infer what they are externally hearing from something internal.

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[64] Peirce 1868, 110, emphasis in original.
[65] Cumming 2000, 57–58.

2.2.2 Hermeneutic significance (listening attitudes)

The previous section outlined the perceptual faculties that a listening subject possesses. I now turn my attention towards the hermeneutic identification of meaningful material. Before discussing what is and is not meaningful, one must first consider how a listening subject can identify meaningful material. In process music, the listener is tasked with not only distinguishing meaningful material, but also participates in the construction of the music. Thus, the listener must not only be aware of the music, but they must be an active participant. This next section outlines the significance of actively participating in the music, which involves not only the role of the listener but also the role of the work.

2.2.2.1 "Play"

Any work of art can be viewed as an object by default, thus making the ontological "being" nothing more than a tangible piece for observation. Lawrence Ferrara describes this being as providing viewers "with a certain amount of inevitability."[66] Thus, by default, the viewer is presented with the composition of the art: paintings are collections of brushstrokes, sculptures are chunks of mineral that have been physically manipulated, music is arrangements of sound that have been categorically organized. Of course, categorizing a work of art by just its basic composition does not encompass all the work's ontological being. Although the work never undergoes a physical change to accommodate for different perspectives, its being is not a stagnant modality.

To understand how an object becomes aesthetic in quality, thus engaging the viewer, consider Hans-Georg Gadamer's concept of "play," where the mode of being in a

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[66] Lawrence Ferrara, *Philosophy and the Analysis of Music: Bridges to Musical Sound, Form, and Reference* (New York: Greenwood Press, 1991), 37.

work of art becomes experiential through the subject's attitude.[67] Think of the work of art

being equated to a game. When one plays a game, Gadamer asserts that one can only

successfully play with serious possibilities. If one considers the opposite results, where a

player in a casual game does not make any attempts to try to play can lead to another,

more serious player to ask, "Are you even playing?" Thus, the work, like a game, is

subject to different experiences based on how one approaches it. Process music engages

in play by subjecting the listener into participating in the process. The listener not only

hears the musical qualities, but also recognizes the construction of the musical work's

inevitabilities.

2.2.2.2 Active participation

The work's subjectivity means nothing without the subject actively participating.

Whereas common practice music, for example, has compositional attributes to which the

listener can refer if they become inactive (i.e., cadences, rests, silence), process music

relies on fewer, more subtle cues. Reich elaborates:

> I begin to perceive these minute details when I can sustain close attention and a
> gradual process invites my sustained attention. By "gradual" I mean extremely
> gradual; a process happening so slowly and gradually that listening to it resembles
> watching a minute hand on a watch—you can perceive it moving after your stay
> with it a little while.[68]

Close, sustained attention—which characterizes active participation—not only allows

Reich to perceive minute details, but he also suggests that actively participating plays a

crucial role in the music's temporal organization.

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[67] See Hans-Georg Gadamer, "Play as the cue of ontological explanation," in *Truth and Method*, 2nd rev. ed., trans. by Garrett Barden and John Cumming (New York: Seabury Press, 1975), 91–119. Originally published in 1960 as *Wahrheit und Methode*.
[68] Reich 2002, 36.

In his recent article on Reich's *Violin Phase* paired with choreography by Anna Teresa De Keersmaeker, Mariusz Kozak's aim of "explicating a particular temporal trajectory" in Reich's work is done through the active listener.[69] When presenting a rebuke to Jonathan D. Kramer's conception of "vertical time" in *Violin Phase*,[70] Kozak explains that the listener runs a risk if they adopt a strategy of "task-based listening" because when a listener is "saddled with mapping out the temporal terrain," then they will "[deflect] the point of contact with the music to some moment that is not explicitly given" to their own consciousness.[71] In other words, they will not attend to the present nor will they be engaged with the immediacy that the present brings. Another risk is engaging with prescribed conceptions of time and temporality, specifically Kramer's temporal categories of linearity and nonlinearity. Kozak elaborates:

> By positing different temporalities as characteristic of musical materials and systems governing how these materials are organized, Kramer paints himself into a corner in which the listener needs to conform to those temporalities if their experience is to be meaningful. Missing from Kramer's account is the recognition of the potential of the listener to effect one or the other strategy and what might fall out of the listening situation if this potential were actualized. By contrast, active listening is a process in which the relationship between the agent and the music undergoes constant change. Active listening to nonlinear music—even of the "uncompromisingly vertical" variety like *Violin Phase*—with a linear strategy does not have to be boring or frustrating; the piece does set up its own expectations, and these expectations are useful in guiding the experience of the listener, even if the nature of this experience is of a different kind than what interests Kramer.[72]

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[69] Mariusz Kozak, "Anna Teresa De Keersmaeker's *Violin Phase* and the Experience of Time, or Why Does Process Music Work?" *Music Theory Online* 27/2 (2021), [3.2]. Because dance is a vital component to Kozak's strategy, the listener's observations expand to include sight along with hearing.

[70] Jonathan D. Kramer, "Time and Timelessness," in *The Time of Music: New Meanings, New Temporalities, New Listening Strategies* (Schirmer Books, 1988), 375–97.

[71] Kozak 2021, [2.4].

[72] Ibid., [2.6].

Engaging with immediacy means that the listener must consider the type of temporality to apply to the music. Kozak even suggests attending to a "nonlinear" work like *Violin Phase* with a linear strategy. However, prescribing temporality can run the risk of a rigid interpretation (i.e., an expected outcome). Thus, a listening strategy that invites different experiences has the potential to lead to multiple valid interpretations.

2.2.3 Attentive awareness

Now with the understanding that the listening subject must actively participate in process music, we can further qualify what kind of active participation is appropriate when a listener engages in Reich's process music. Kozak's strategy is a viable option, but my inquiries into gestural signification in process music primarily focuses on the sonic qualities rather than engaging in real-time experiences. With this in mind, Cumming describes three types of awareness that can be adopted as a listening strategy: attentive awareness, awareness of sound as "other," and alternative revisions to sound and/or their signification.[73] I assert that attentive awareness is the most suitable type of participation needed to be actively engaged in process music.

According to Cumming, attentive awareness involves "an attentiveness to quality, which continues for the duration of the sound."[74] The ultimate quality in process music for which a listener music be attentively aware is the perceptible process. Again, what separates minimalist music from the preceding abstract expressionist music is that, whereas both rely on a process, one can hear the process occurring in process music. Phase, Reich's most common compositional technique used in his process music, affects

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[73] Cumming 2000, 61.
[74] Ibid.

the quality of the sound, becoming aurally identifiable to the listener. A listener adopting attentive awareness in a phase-as-process work can indicate when the music is in moments of phase, when the music arrives at a different pattern, and when the music departs into another moment of phase.

Attentive awareness must also be an unselfconscious act. Cumming explains that "a full attention to the sound precludes a deflection of thought to the self during the act of perceiving."[75] Self-consciousness typically arises in moments of unfamiliarity and thus the self attempts to rationalize such moments to be familiar. If a listener approaches unfamiliar music with attentive awareness, their attention is focused on the musical qualities rather than themselves. The listener must avoid defaulting to a self-conscious attempt to organize the works through personal prejudice and allow the musical qualities to unfold. Of course, there are some caveats. Cumming does recognize that distractions occur, self-reflection can occur in retrospect, and moments of awareness can be broken. Adopting this listening attitude raises a question: is there only one correct way to listen to process music? Because of the specific attitude involved in the act of listening, one might be inclined to answer in the affirmative. However, listening will affect what one hears, and thus the back-and-forth between what one hears due to how one listens determines the outcome.

In its purest form, according to Cumming, "no explicit awareness of the self will occur" in attentive awareness.[76] In other words, this act is impersonal, which is exactly what Reich wants listeners to strive for. Not only has he described listening to a gradual

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[75] Ibid.
[76] Ibid.

process as an impersonal kind of ritual, which can be equated to Cumming's use of "unselfconscious," Reich claims that "listening to an extremely gradual musical process opens my ears to *it*," which is "that area of every gradual (completely controlled) musical process, where one hears the details of the sound moving out away from attentions, occurring for their own acoustic reasons."[77] Such a result, which includes moments of patterns moving in and out of phase, are only possible as long as the listener actively participates.

2.3 Gesture

Consider Paul Epstein's thoughts on the ontology of Reich's process music as it pertains to the listener:

> In experiencing process music, the listener's task is also one of discovery—of the physical laws embodied in the process and of the psychological laws affecting the listener's interaction with the process. It is in this interaction that the coming together of impersonal and personal takes places that forms the key experience of process music.[78]

This key experience is further described by Galen Brown as an aesthetic experience, where the listener's objective involves "exploring what inherently aesthetically interesting sonic results arise" from the musical process.[79]

Most analyses of minimalist music are limited in their ability to reveal aspects that pertain to the personal role of the listener, focusing primarily on the impersonal side of the composition. I say this not as a rebuke. Structural, systematic analyses of the impersonal in process music have found interesting, quantifiable attributes. However, to

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[77] Reich 2002, 35, emphasis in original.
[78] Paul Epstein, "Pattern Structures and Process in Steve Reich's 'Piano Phase,'" *The Musical Quarterly* 72/4 (1986), 494.
[79] Galen H. Brown, "Process as Means and Ends in Minimalist and Postminimalist Music," *Perspectives of New Music* 48/2 (2010), 187.

investigate the personal, psychological, and subjective side requires adopting a different analytical lens. This lens must incorporate the listener's role while still addressing the compositional aspects of the music. It must also be capable of inviting multiple subjective interpretations. Although speculative in nature, such an approach gives validity to the listener's experience and acknowledges Reich's philosophy and original intentions.

One of the most effective concepts to apply in this vein is musical gesture. In his book on gesture in common-practice music, Hatten asserts that gesture relies upon "the ability to recognize the significance of energetic shaping through time."[80] Identifying this energetic shaping will involve several analytical considerations such as musical forces and their impact, the effect of compositional techniques on the listener, qualifying their subjective experience, and semiotically identifying how areas of the music signify energetic shaping through time. Identifying, qualifying, and explaining gesture as such will result in a new analytical discourse that covers the listener's overall experience in minimalist music.

2.3.1 Hatten's theory of gesture

Before I discuss the theory of gesture and its musical application, Hatten cautions analysts against adopting an overly simplified use of gesture:

> Ultimately a theory of gesture entails, and demands for its relevance to analysis, a stylistic theory of expressive meaning. Unless we are committed to interpretation and explanation of more than the syntax of a work, we really do not need a rich theory of musical gesture, and we can default to the category of "motive" as a more abstract stand-in for gesture.[81]

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[80] Robert S. Hatten, *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert* (Bloomington, Indiana University Press, 2004), 93.
[81] Ibid., 123. Cumming similarly explains in her analysis of Bach's "Erbarme Dich" that gesture is not "a fanciful labelling of something that could be more accurately labelled using a structural term." Naomi Cumming, "The Subjectivities of 'Erbarme Dich,'" *Music Analysis* 16/1 (1997), 9.

Whereas there has been a seemingly ubiquitous application of gesture as a structural term in music, there must be an extra-musical and significant use in gestural analysis for it to be properly labeled as such. For Hatten, musical style is integral to the extra-musical context of musical gestures. When an analyst does not make these considerations, gesture defaults to a more colloquial definition that is a synonym to a structural detail or segmented collection of notes. For example, in her book *On Repeat: How Music Plays the Mind*, Elizabeth Margulis had subjects listen to excerpts in a study that focus on recognizing "three- or four-note elements that repeated within changing eight- or ten-note gestures."[82] Without any significant context for these so-called gestures, the three- or four-note elements are simply embedded within a pattern.

Hatten's theory of musical gesture is derived from foundational attributes of human gesture. He explains that recognizing the significance of energetic shaping through time touches upon competencies that are fundamental to our existence. Competencies crucial to the performance and interpretation of human gesture include functional coherence, intermodality, perceptual integration, and intersubjectivity. Functional coherence focuses on the understanding of our sensorimotor system, our ability to perceive, enhance, or manipulate objects, and our physical interaction with the environment. The intermodal competency is based on continuity and consistency of actions. In other words, it reflects the shared representation of events. Two different people playing the same musical work, for example, will have an intermodal connection because both performers rely on similar biological systems in their interpretations.

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[82] Elizabeth Hellmuth Margulis, *On Repeat: How Music Plays the Mind* (New York: Oxford University Press, 2013), 38.

Perceptual integration expresses the stages of the perceptual synthesis of events based on their imagistic patterns and temporal continuity. This will be the most crucial competency in our understanding of process music. Lastly, intersubjectivity focuses on perceiving the expressiveness of others, a phenomenon known as alteroception. Listeners and performers rely on these competencies for appropriate gestural interpretations of the music at hand.

2.3.2 Gestural signification

Finding the significance of energetic shaping involves more than qualifying meaningful attributes. Whereas significance from a hermeneutic perspective explores this, significance from a semiotic perspective explores how something is signified and interpreted such that it is deemed meaningful. Cumming describes the principal value of a semiotic theory as "the guidance it gives to the process of interpretation itself."[83] Thus, a semiotic framework can explain how process is represented such that one can create gestural interpretations. Musical gesture recognizes the shortcomings of musical notation, as notation, according to Hatten, "cannot adequately represent the continuities of gesture."[84] This is especially true with process music, as the scores in Reich's performative works are used as instructions more than anything else. Gesture beyond notation leads the analyst to consider several approaches to the music including embodiment, energetics, intertextuality, and semiotics. For the purposes of studying process music, I will consider the semiotics behind the listener listening to music and participating in the act of "hearing as." This entails listening to the qualities of sounds

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[83] Cumming 2000, 80.
[84] Hatten 2004, 113.

and interpreting them as signs.

As discussed in Chapter 1, Peircean semiotics consist of a fundamental division of signs, divided by into the semiotician's representamen-object-interpretant triad. To put it succinctly, Peirce's triad lays the foundation for one to express an interpretation of an object and its representation. Furthermore, said representation can be broken down further into other qualifiable signs. Musically, Cumming explains that gesture acts as the semiotic interpretant, which "allows *x* (the 'representamen') to represent *y* (the 'object')."[85] The musical gesture will be the interpretant, which will allow the sounds of process music, the representamen, to represent process, the object.

2.3.3 Perceptual salience and repetition

Phase-as-process music invites the listener to discern between the unison pattern, moments of phase, and arrivals/departures of the composite pattern. Such a differentiation is crucial in not only identifying structural markers but also in identifying gestural emergence. Per Hatten, gesture relies on the listener's identification of two distinct gestalt representations:

> A prototypical gesture is a relatively short temporal gestalt that generally occurs within the temporal frame of the experiential present, or working memory (ca. 2 seconds). Typical gestures are thus advantageously positioned to take advantage of two major forms of representation in the brain: the immediate or imagistic, so crucial to identification of faces (and their emotive character), and the sequential or temporal, so crucial to the identification of individuals through their movement.[86]

The listener actively participates by immediately recognizing how the energetic shapes are grouped into an imagistic gestalt and how a temporal gestalt continuously takes shape

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[85] Cumming 1997, 8.

[86] Hatten 2004, 101. Although it is a German noun, I adopt Hatten's use of gestalt as lowercase.

through the piece's literal movement.

Hatten further elaborates that gestures, which synthesize the immediate imagistic gestalt and mediate temporal gestalt together, are perceptually salient.[87] In other words, the gesture itself is a perceptually distinct entity. In common-practice music, the combination of pattern recognition and continuation is more discrete because the music contains perceptual rests and breaks. This includes formal themes, harmonic cadences, and rests. Process music, on the other hand, is continuous in one direction to ensure the process sets up and goes, and the continuity is prolonged through repetition. Thus, in a general listening setting, one might observe that there are no perceptual breaks in process music.

However, this does not mean process music lacks salience. On the contrary, repetition is needed to establish perceptual salience in process music. If the listener successfully distinguishes pattern and phase, they will discover that the former differs from the latter due to its repetitive structure. This leads to an important occurrence found in process music: composite patterns become settled and discrete events away from phase through repetition. Margulis asserts that repetition functions in an oblique manner that "gives rise to some impression that registers as an expressive quality, rather than as explicit recognition of repetitiveness." [88] Margulis makes two important points. First, the impression of expressive quality is certainly subjective. The listener in process music must recognize that the repeated unit's function is to express salience. Second, in recognizing repetition as an expression of the unit in process music, the listener realizes

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[87] Ibid., 102.
[88] Margulis 2013, 35.

the temporal signification that salient units are recognized as a means of following the process. The unit is not repetitive for the sake of being repetitive, but for the sake of recognizing gestural salience or its function is to express salience. A perceptually salient gesture in process music is found in the pattern, established through repetition, and emerges through the listener's interpretive competencies.

Perceptually salient gestures come not from its identification on the score, as the score, especially in process music, is mostly intended as a reference, but from the listener's own identification within the music. Thus, there is one further consideration to better suit perceptually salient gestures found in process music, and that is the describing of the type of repetition used. In his studies on popular music, Richard Middleton defines a spectrum of repetition strategies with short, musematic repetition on one end and large-scale, discursive repetition on the other.[89] Musematic repetition is made up of "musemes," defined as "the smallest meaningful units within a system."[90] In her article on categorizing minimalist works into different types of tropes, Rebecca Leydon asserts that "willful effort" is required in using Middleton's discursive repetition in order to project hierarchy.[91] However, I assert that willful effort (i.e., active participation in the form of attentive awareness) is required in musematic repetition for gesture to emerge. This allows for units in process music to both contain small units while still ascribing to a unique form of perceptual salience.

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[89] Richard Middleton, "'Lost in Music'? Pleasure, Value and Ideology in Popular Music," in *Studying Popular Music* (Open University Press, 1990).

[90] Rebecca Leydon, "Towards a Typology of Minimalist Tropes," *Music Theory Online* 8/4 (2002), [7].

[91] Ibid, [8]. Further qualifying interpretations through troping is a promising analytical avenue. For my intents and purposes, I will forego using Leydon's minimalist tropes in my analyses. See Chapter 5 for further elaboration.

2.3.4 The musical subject

Along with Leydon's focus on the character of the musical subject, which is detailed by different tropes of repetition found in minimalist music, she is also focused on the intention of the character.

> I draw on the work of these scholars to reinforce the notion that a palpable sense of volition in a musical work has something to do with our awareness of hierarchies in the music. This suggests that, depending upon whether an ostinato is more "discursively" or more "musematically" oriented, repetition can tell very different kinds of stories about the musical subject. The internal structure of an ostinato itself, as well as its interaction with other lines or other ostinato, can suggest a subject with particular kinds of volitional attributes.[92]

I share Leydon's assertion that the types of repetition will affect the listener and their interpretation of the work. What is mischaracterized in process music, however, is that the ongoing use of short musemes means the type of progress is lesser in quality than in, for example, large-scale forms found in common-practice music. On one hand, common-practice music is more harmonically, melodically, and formally explorative, allowing the listener's intuition to better systematize its structure. On the other hand, the simplicity of process music gradually moving from one place to the next has long been viewed as lesser in aesthetic quality. Repetition certainly plays an influential role in this.

Because some scholars have mischaracterized process music to be an objective music—or a music where subjectivity is lost in its compositional qualities like repetition—I posit that the most pertinent musical subject to study in process music in relation to its gestural qualities is the subjectivity of the work itself. One must understand that process music's volition is predetermined because the outcome is, by default, predetermined by the process prescribed to each work. That should not take away from

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[92] Ibid., [9].

the aesthetic valuation of intention it presents to the listener, and the listener should not sacrifice attention because of the work's simplicity in its hierarchy.

2.4 Listening to a Gradual Process in *Melodica*

Having established that a listener adopting attentive awareness is the sole arbiter of meaning in process music and therefore can ascertain musical gestures, I will now show two analyses—one representing Reich's phase-as-process works and another representing his augmentation-as-process works—that demonstrate gestural iconicity.[93] This first analysis seeks to uncover the signification behind the sounds of the process in Reich's final tape work, *Melodica* (1966). A better understanding of Reich's intention behind the work's phase-as-process and the listener's function will greatly benefit an analyst's understanding in both tape and live process music. I will consider the individual sonic qualities, Reich's musical process, and gesture, and how they fit the Peircean representamen-object-interpretant trichotomy respectively. Emerging from this synthesis is an understanding that musical gesture allows particular musical qualities to represent Reich's musical process. I will also show Hatten's stylistic identification of gesture with subjective reinterpretations of the score.

2.4.1 The object: process

In its broadest definition, an object is an observable thing. It can be tangible or intangible, present or absent. Assigning musical process as our object may be peculiar, as it is neither a present nor tangible entity. However, because Reich has a particular

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[93] Works that are not analyzed include *Slow Motion Sound* (1967), *My Name Is* (1967), *Pulse Music on The Phase Shifting Pulse Gate* (c. 1969). Moving into the next decade, *Phase Patterns* (1970) skirts the line between its use of phase as a musical process versus it being the underlying process. I will discuss in the next chapter in further detail.

definition and application in how it is created and employed, process is observable on the score and, more importantly, in the sound. Thus, the first step is to properly identify process as the object. This includes what it entails, how it functions, who is behind it, and who or what makes it significant. As I have discussed already, what it entails and how it functions are mutually inclusive due to content and form determining the other simultaneously. Example 2.2 shows the score for *Melodica*. The work consists of eight measures, with unison patterns in mm. 1 and 4 and subsequent composite patterns in the other six measures. As with other process works, the patterns themselves (i.e., how they are initially presented and subjected to process) directly correlate to their placement— form suggests content, and content suggests form.

The work begins with a four-note unison pattern divided into a pair of two-note onsets separated by rests. As is typical of Reich's composing, the rhythmic structure of this unison pattern is syncopated. However, a listener's continuous attention towards the offbeats can be altered as the work moves forward; this is a matter of awareness and familiarity. As with every phase-as-process work, patterns are formed after one part slowly moves one note ahead of the constant part until it arrives at the predetermined composite pattern. After two phase shifts, the composite pattern found at m. 3 is "reset" as a new unison pattern in m. 4. What was initially a four-note pattern now has twice as many onsets. This pattern is subjected to four more phase shifts until it arrives at m. 8, where Reich instructs the measure to be played for more than two-and-a-half minutes. Said pattern is confirmed as a salient entity through musematic repetition.

Example 2.2 Steve Reich, *Melodica*.

Although it is a tape work, the realization of process in *Melodica* is the same as

Reich's instrumental phase-as-process works. In other words, performers playing process

music should adhere to the instructional score parameters in the same way Reich

manipulates tape. In both instances, the composer has control in how the process is

realized. The mediums simply need different instructions to get the same results. Thus,

the function of the performer is not a matter of nuance, inflection, and the like, but rather

strict realization of the process. The performative mediation involved (i.e., actions

embodying the potentialities of what is written on the score) is foregone. This assertion is

not made to diminish the effort it takes for one to perform process music. *Piano Phase*

and *Violin Phase*, for example, require an immense amount of concentration, maturity,

and technique in order to capture Reich's original intent: setting up the process and

letting it go. However, the instrumental phase-as-process works still follow the same

treatment of its material as Reich's earlier tape works.

Melodica provides an interesting bridge from tape to musician. The score instructs

that the first unison pattern is performed by "the composer," then looped, and finally

subjected to the process through tape. Does this suggest, then, that the performer is the

composer? Considering the factor of control, I am inclined to suggest that it does not.

However, the performer's role is tightly knit with the composer due to the fact that Reich

has specific intentions in how the process is realized in order to get the desired outcome.

In this case, the composer could be Reich providing the beginning unison pattern as a

recorded loop. It could also be the performer "composing" the loop by recording the

pattern themselves. It is a minute but important distinction, and in this case the quality of

the beginning loop should not affect the process being realized so long as the loop serves as the foundation for which the performer phases into composite patterns.

2.4.2 The representamen: sounds of process music

What makes the music significant in process music is that the qualities of the sounds evoke a likeness to process itself. In semiotic terms, these sounds act as the representamen, specifically, iconic signs, to the object of process. In describing the significant emergence of sound, Cumming explains:

> The sound, in its potential to signify, has many attributes which a practitioner needs to be able to discriminate in order to correct for poor sound production: scratchiness, unevenness, lack of resonance through being "forced," and so on. The quality which it actually signifies, its metaphorically described "object," is an emergent property of the sound-as-heard, irreducible to any of its individual characteristics.[94]

The sound-as-heard in process music is immediate due to its compositional design. The signification of inflection, nuance, and the like from the performer is foregone in favour of the process being realized. Thus, the immediacy of what one hears in the sounds can be attributed immediately to the object. Further, as discussed, the one to directly attribute the sound to the object is a listener adopting attentive awareness.

Following the identification of process as the object, the next step is to consider how the music, or, more explicitly, the sounds of process, create a feeling or representation of process itself. Consider the First Law of Mentat from *Dune* cited at the beginning of the chapter: "A process cannot be understood by stopping it. Understanding must move with the flow of process, must join it and flow with it." [95] Like Reich's

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[94] Cumming 2000, 77.
[95] Frank Herbert, *Dune* (Philadelphia, Chilton Book, Co. 1965) [Reprint: London: Penguin Books Ltd., 1987], 50.

processes, the First Law's process is continuous by design. This is implied by its caution

of stopping it. Understanding is imperative—process music moves on its own just fine,

but engaging with the flow of the process introduces a mode of signification that is not

present. Thus, signification emerges from proper understanding, and in the case of

process music, it is crucial for the listener to avoid aural stops and engage with the flow.

There are two actions in achieving a successful understanding of the process:

moving and joining. Joining is self-explanatory, as it is achieved through engagement

starting from the beginning. The listener is then responsible for how the music moves, be

it following the process, participating in its own construction, or a combination of both.

They will be the ones to infer a "flow" within the process. The "flow of the process" is

analytically significant. In our semiotic account of an experience, according to Cumming,

flow provides a potential quality of process which will create an interpretive response.[96]

In process music, such a response can be as simple as, "this process flows." Thus, the

signification of flow operates insofar as it becomes the quality that represents process.

It is up to the attentive listener to ascribe sounds that bring to mind the "flow" of

process. The sounds in process music are all in service to a slow, perceptible process. In

Melodica, we can see on the score and hear in performance the patterns moving in and

out of phase.[97] The realization of process through the fluctuation of phase and pattern is

slow and gradual, just as Reich intended. These sounds present a likeness to our object of

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[96] Cumming 2000, 113.

[97] For a recording of *Melodica* see penguinistan, "Steve Reich – Melodica," February 21, 2015, YouTube video, 8:16, https://www.youtube.com/watch?v=bcHZZKgkiWw. I want to thank Ryusuke Koarashi and penguinistan for allowing me to use their recording.

musical process. The sonic representamina of the object are further qualified as icons,

defined by Peirce as such:

> An *Icon* is a sign which refers to the Object that it denotes merely by virtue of
> characteristics of its own, and which it possesses, just the same, whether any such
> Object actually exists or not. It is true that unless there really is such an Object,
> the Icon does not act as a sign; but this has nothing to do with its character as a
> sign. Anything whatever, be it quality, existent individual, or law, is an Icon of
> anything, in so far as it is like that thing and used as a sign of it.[98]

What garners significance from the sounds is the listener conceptualizing them as

indirectly signifying certain attributes of the object. Further, icons only gain significance

from the listener's inference of the process's realization. This is why the performer is

relegated in their role: if they do anything but realize the process, then the listener can

potentially focus on other irrelevant details and infer a type of signification that does not

properly reflect the intention behind the musical process. The onus is on the listener to

infer the iconicity behind process.

2.4.3 The interpretant: musical gesture

With an understanding of the representamen's signification, the listening subject

can create an interpretant in the form of a musical gesture. Cumming explains that the

interpretant "[allows] a very important distinction between what the sign conveys in the

moment of its presentation and what constitute the preconditions of its being

understood."[99] Having already discussed the latter, the remainder of this analysis seeks to

identify what the music conveys in moments of gestural activity in *Melodica*.

The question remains, where can one identify gesture in process music? Two

schools of thought, one stylistic and the other semiotic, were discussed previously. In this

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[98] Peirce 1940, 102, emphasis in original.
[99] Cumming 2000, 75.

analysis thus far, I have talked about the emergence of gesture based on the sounds signifying the process. From this perspective, so long as there is recognition of the signifying in action, gesture can be identified where the listener creates the interpretation in real time. The other perspective is a stylistic one. For Hatten, gestures (in common-practice music) are perceptually salient, lasting no more than two seconds in length. In discussing the latter perspective, the salience can be identified in *Melodica* by recognizing the difference between phase and pattern. It is the most recognizable event for the listener, and it allows the process to maintain its autonomy.

In connection to perceptual integration, Hatten describes gestures as "perceptually *synthetic* gestalts with *emergent* meaning, not simply 'rhythmic shapes.'"[100] This is significant because works like *Melodica* appear to be just rhythmic shapes subjected to a process. The synthetic gestalt Hatten speaks of consists of a bifurcation of an imagistic gestalt and a temporal gestalt. Qualities found on the immediate grain or texture are grouped into patterns belonging to the imagistic gestalt, and qualities found in sequential and continuous events are mediate and belong to the temporal gestalt.

Both gestalten will create different sonic properties for the listener. The imagistic gestalt emphasizes immediacy. Figure 2.1 shows the emergence of the imagistic by splitting channels one and two in *Melodica* as upper and lower staves respectively. With this separation, one can follow the interactions of the separate parts. This includes how they diverge, how they come together, how the meter is affected, and so on.

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[100] Hatten 2004, 94, emphasis in original.

Figure 2.1 The imagistic gestalt realized in *Melodica*.

The temporal gestalt emphasizes continuity. The representation in Figure 2.2 shows a combination of the interplay between the constant channel one and the ever-shifting channel two. In other words, this shows a subjective reinterpretation of the composite patterns. For example, with twice the number of onsets, mm. 5–8 augment the interplay within the texture. Each composite pattern has a new contour that emerges— one high part, one low part—and a new rhythmic pattern from the addition of a new note that results from channel two's phasing. Notated in the upper and lower contours in mm. 5, 6, and 7 are pairs of five-note, six-note, and seven-note onsets respectively. The final composite pattern in m. 8 shows the ultimate convergence of the high and low parts alternating each sixteenth note. Whereas the imagistic representation focuses on the immediately identifiable attributes in *Melodica*, the temporal representation triggers different types of patterns based on how said patterns emerge to the listening subject.

Figure 2.2 The temporal gestalt realized in *Melodica*.
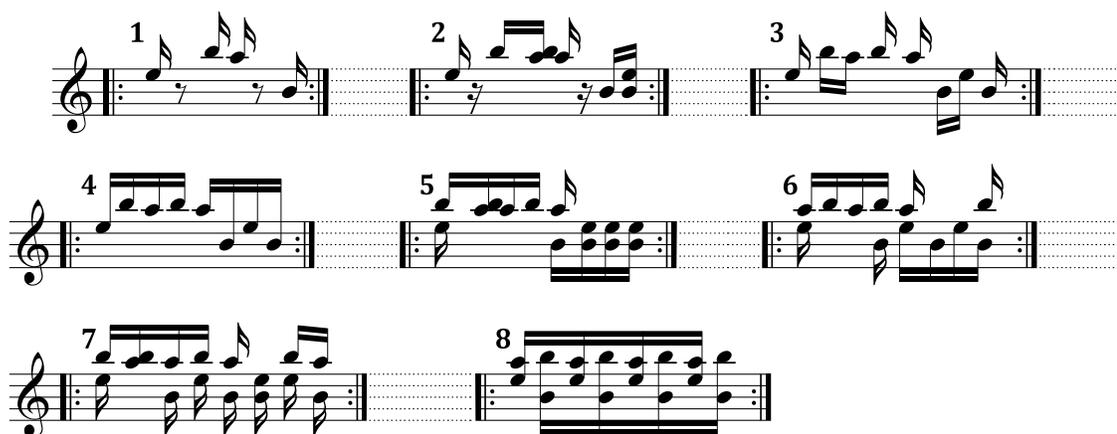
These representations are my subjective interpretations of the gestalten in *Melodica*. The more one agrees with a reading such as mine, the more the representation, and thus the gestural inference, becomes intersubjective. However, intersubjectivity can still be obtained if listening subjects share common ground in the interpretation of the musical gesture. In process music, this means agreeing that the iconic representamen signify the process as the object.

From these two gestalten comes a synthesis within the texture. Inferring gesture is as much about the differentiation of parts as it is the perception of the patterns. The representations shown in Figures 2.1 and 2.2 illustrate a type of perceptual process that the listener takes on as part of their attentive awareness to the music. However, for Cumming, our semiotic interpretant that is musical gesture is not about perceptual processes but rather the interpreted outcome.[101] The gestalten representations I have shown are not objective representations, nor the only interpretations, but rather ones that determine the type of interpretation. From a structuralist perspective, the mode of

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[101] Cumming 2000, 112.

representation given to the object will thus directly affect the interpretation. This is how the question, "Is there only one way to listen to process music?" can be answered in the negative: attentive awareness will determine the results of a listening subject's interpretation of the compositional activity. This means that different inferences of musical gesture are a possibility. For process music, what one deems as the activity (i.e., the sound qualities and their textural interactions) signifying the flow of process is what will determine the interpreted outcome of a gesture.

2.4.4 Closing

In phase-as-process works, it is not about whether the sound is process, but whether the sound has an indirect likeness or representation to process. If Reich's intention as the composer of process music is creating "a compositional process and a sounding music that are one and the same thing," then the listener's intention must be to infer the sounding music eliciting a likeness to a compositional process.[102] This is how gestural emergence can operate in music not centered on a performer's input, as they, in the case of process music, cannot interfere or create a disservice to the underlying process. In the case of *Melodica*, as well as other phase-as-process works, the synthesis between individual and grouped sounds constitute a sonic likeness to the flow of process.

2.5 Musical Forces: *Pendulum Music* and *Four Organs*

As I discussed previously, there are two notable early works that do not use phase to convey process: *Pendulum Music* (1968) and *Four Organs* (1970). The former literally realizes the physical phenomena of gravity and inertia through swinging microphones, and the latter musically represents the effects of the same physical forces. While

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[102] Reich 2002, 35.

Pendulum Music augments the length of individual tones over time, *Four Organs* augments a dominant eleventh chord by longer time signatures composed as the work progresses. Due to their seemingly straightforward design, these "augmentation-as-process" works tend to receive less analytical attention from scholars than the phase works for which Reich is better known. This analysis demonstrates how the sounds (i.e., iconic representamen) signifying process are expressed through literal and metaphorical forces. Because I assert *Four Organs*, realized through score, to have an equivalent process to *Pendulum Music*, realized through instruction, I will rely upon animated representations of the compositional activity rather than score.[103]

2.5.1 *Pendulum Music*

The first work, *Pendulum Music*, requires two to four performers to pull back two to four microphones "like a swing" and release them at the same time, thus creating a pendular motions in each microphone.[104] Reich specifies in his notes that "Each microphone's cable is plugged into an amplifier which is connected to a speaker."[105] After the performers release the microphones, they are instructed to slowly turn up the amplifier so that the feedback from the microphone being in close proximity with the speaker is audible. *Pendulum Music* serves as a musical realization of a physical phenomenon (e.g., an object, fixed to a fulcrum, being dropped from a distance), with the motion of the microphones being analogous to pulling back a swing or pendulum. Reich makes this readily apparent in "Music as a Gradual Process" when he says that listening

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[103] The example captions will provide a video link to each animation.
[104] Steve Reich "Pendulum Music" © Copyright 1980 by Universal Edition (London)Ltd., London / UE 1655
[105] Ibid.

to and performing process musically resembles "pulling back a swing, releasing it, and observing it gradually come to rest."[106]

Pendulum Music is unique because the work functions without the presence of live musicians or tape to realize the process. The musicians' objective is finished after they release the microphones; their function is more of initiating than it is of performing. In being analogous to musical performance, I assert that the force of gravity and inertia act as unseen performers, and that their function is integral for the process to be successfully conveyed. In the physical motion of a pendulum, gravity pulls it down to "its most stable position," according to Steve Larson, and inertia continues the motion beyond the point of stability.[107]

Video 2.1 is an excerpt of *Pendulum Music* shortly following the work's initiation.[108] This video is coupled with four pendulum animations that show the motion of each pendulum. My pendulum animations correspond to the order in which the video's microphones are shown from left to right. Each microphone will have its own pendulum animation that shows the middle arrivals and directionality. The former is represented by an orange node and the latter is represented by an arrow.

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[106] Reich 2002, 34.

[107] Steve Larson, "Musical Gestures and Musical Forces: Evidence from Music-Theoretical Misunderstandings," in *Music and Gesture*, edited by Anthony Gritten and Elaine King (Burlington, VT: Ashgate Publishing, 2006), 63.

[108] Phillipe LANGLOIS, "Pendulum Music Steve Reich 1968," May 8, 2014, YouTube video, 1:15–1:29, https://www.youtube.com/watch?v=fU6qDeJPT-w&t=5s.

Video 2.1 Steve Reich, *Pendulum Music*, opening excerpt. ([Video](#))
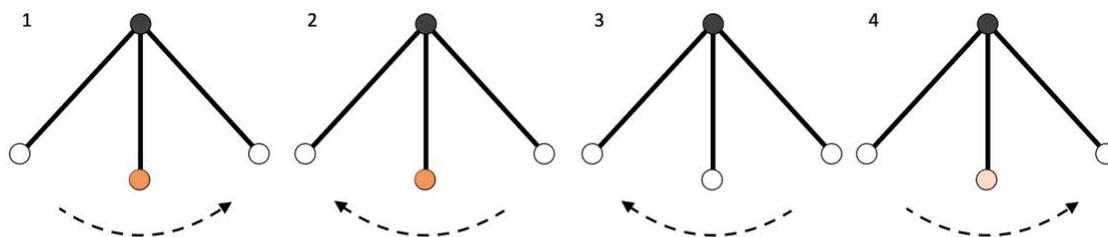
Video 2.1

Martin Ross
University of
Western Ontario

With gravity and inertia at work, there are two notable effects that occur when the microphones come into close proximity with the speakers. The first has to do with the length of a singular sound (i.e., one microphone). The duration of the sound is determined by the microphone's distance from their own speaker and the speed at which they are swinging. The sounds are short to begin and gradually become longer until the microphones come to a halt. The second effect has to do with the number of sounds. When multiple microphones are dropped, multiple sounds are made and subsequently form composite rhythms.

Regarding the singular sounds in this excerpt, all four microphones are moving at approximately the same speed and therefore their feedback is approximately the same duration. This is shown in Video 2.1 as the length of the orange dot. Each orange dot is qualified as an onset. There are three individual onsets for every repetition: microphone 3, then 4, then 1+2. In this performance, microphones 1 and 2 move in opposing

directions, but their speed and timing are aligned so that they make one onset that is approximately the same length as microphones 3 and 4. Furthermore, I interpret this composite pattern as a "short-short-long" rhythm. Although the onset durations are all approximately equivalent, I view the 1+2 onset as a long rhythm because there is a longer period between their onset and the arrival of microphone 3's next onset. Figure 2.3 shows a representation of this rhythmic grouping.

Figure 2.3 Steve Reich, *Pendulum Music*, opening rhythmic grouping.
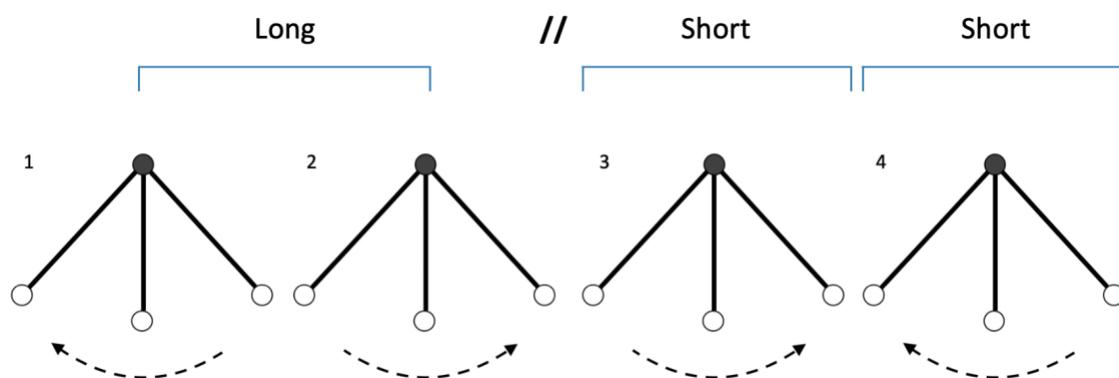
Gravity and inertia conceptualized musically in *Pendulum Music* elicits the iconic representation of process, thus creating an interpretation that is gesture. Rather than the signified process in Reich's phase-as-process works, which perpetually move forward through incremental phase shifts, the signified process in the augmentation-as-process works use musical forces to demonstrate the work slowing down. As Larson points out when speaking of forces:

> One could say that we do not directly experience physical forces. Rather, we experience the effects of forces—that is, we do not experience gravity but we experience its effects when we fall. Likewise, we do not directly experience musical gravity, but we experience its effects when we hear a melody as "falling."[109]

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[109] Steve Larson, *Musical Forces: Motion, Metaphor, and Meaning in Music* (Bloomington: Indiana University Press, 2012), 83.

For Hatten, the gestural application of Larson's model is not a direct use of gesture, but that the forces are an "implied *source* of gestural energy," meaning that the forces contribute to the energetics behind the gesture.[110] In other words, there can be an energetic component to the sounds in gesture in the form of musical forces. As is evident in *Pendulum Music*, the sounds this augmentation-as-process works are motivated through the literal forces of gravity and inertia.

2.5.2 *Four Organs*

The other augmentation-as-process work is *Four Organs*, which Reich composed with the idea that one sonority would gradually get longer as the work continued. As the name suggests, the work requires four organists as well as a performer on maracas providing a constant eighth-note pulse. The organists all play the same E dominant eleventh chord, beginning with a measure consisting of 11 notated beats and ending with 156. The opening is shown in Example 2.3. The effect of this, as described by K. Robert Schwarz, is of the listener being "constantly drawn toward anticipating the next step in the augmentation procedure, producing a sense of directionality that none of the early phase pieces possess."[111]

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[110] Hatten 2004, 115, emphasis in original.
[111] K. Robert Schwarz, "Steve Reich: Music as a Gradual Process: Part II," *Perspectives of New Music* 20/1–2 (1981), 230.

Example 2.3 Steve Reich, *Four Organs*, mm. 0–1.

Steve Reich, "Four Organs"
© Copyright 1980 by Universal Edition (London)Ltd., London / UE 16183

The process in *Four Organs* is metaphorically equivalent to the process in *Pendulum Music*. Both works share the musical quality of tones beginning with short attacks that slowly undergo temporal augmentation. Whereas the former augments the length of individual tones, the latter augments a single chord. From a referential perspective, I believe there are two sections in *Four Organs*: one that prepares the augmentation and the other realizing the augmentation itself. The first area presents an E

dominant eleventh chord through several differing articulate events. Once this is completed, the full dominant eleventh chord is then subjected to the process of temporal augmentation, where the material metaphorically "slows down" as the measures get longer. The following scoreless, animated analysis demonstrates how the musical forces of gravity and inertia create musical gestures.

Four Organs metaphorically demonstrates the effects of gravity and inertia that *Pendulum Music* does in three different stages. When an object is released from on one end of the pendulum, it accelerates into the middle point. This is the first stage: Reich creates an initial rhythmic pattern with the maracas to make its way towards a middle point. This is realized by the maracas in m. 0 of the work. Through "rhythmic gravity"— a term Larson defines as a quality attributed to rhythm "that reflects the impact physical gravity has on the physical gesture onto which we map that rhythm"—the object arrives at the middle point.[112] Reich, in fact, begins the work this way by introducing the full chord.

Following the arrival at the middle point, the object does not simply stop. Due to its inertia, the object continues in the same direction, subsequently moving away from the middle point and arriving at the opposite end. Musically, Larson describes this as "the tendency of a pattern of motion to continue in the same fashion, where the meaning of 'same' depends on how that pattern is represented in musical memory."[113] The opposite end is then accentuated by a full attack of the chord at the beginning. Finally, after the second attack of the chord, the third stage involves the gravitational force pulling the

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[112] Larson 2012, 149.
[113] Ibid., 96.

music back towards the middle point, thus changing the directionality of the music and repeating the process as well as creating new gestures.[114]

The majority of my gestural animations are from the first section, which prepares the augmentation section by progressing through different ways in which Reich can articulate the materials. These progressions are expressed through a metaphorical pendulum. Further, a new gesture can be considered each time Reich develops a new way to develop the material. To maintain the symmetry in the pendulum metaphor, each gesture should be conceptualized as their own separate pendulum. Thus, each respective representation can be further qualified as Peirce's singular signs, or "sinsigns," where, according to Cumming, events are heard "*as* X (described in metaphoric terms)," with our metaphor being the pendulum.[115] The focus, however, is still on the sonic iconicity of the work setting up the augmentation and realizing it.

Video 2.2 represents the beginning gesture in *Four Organs*. The recording used to mark time points in each example is performed by Bang on a Can from the 2005 Nonesuch Records album.[116] Modeled after a pendulum, the three nodes, two outer and

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[114] While expanding upon Larson's musical forces, Hatten suggests several types of virtual agencies in his 2012 *Music Theory Online* article. In particular, he speaks of an "initiatory energy" that creates "implicative momentum," the latter of which is needed to "imply" a musical inertia. For Hatten, musical inertia not a force but rather "an acknowledgement that momentum from a virtual agent will tend to continue." While there is merit to consider virtual agency, I will limit the scope to only considering metaphor for my intents and purposes. Robert Hatten, "Musical Forces and Agential Energies: An Expansion of Steve Larson's Model," *Music Theory Online* 18/3 (2012), [17] (Figure 1).

[115] Cumming 2000, 84, emphasis in original.

[116] Steve Reich, "Four Organs," in *Works 1965–1995*, with Michael Gordon, Lisa Moore, Mark Stewart, Evan Ziporyn, and James Preiss, Nonesuch Records, 603497092666, 2005, compact disc. For an in-depth look on the instrumental choices and their subsequent effects to the sound in *Four Organs*, see Sumanth Gopinath, "'Departing to Other Spheres': Psychedelic Science Fiction, Perspectival Embodiment, and the

one in the middle, represent three areas where musical material is articulated. I have labeled the middle node sounding the full chord as "attack x" and the outer nodes sounding the full chord as "attack y." For it to be a full attack, the complete dominant eleventh chord must sound. Attack x is the first attack of the work and will always be at the middle of the pendulum. The motion to get to x is possible due to gravity, the direction of which is dictated by the arrow. The continuation into the second attack, y, is possible through musical inertia.[117] Upon arrival at y, gravity moves the arrow in the opposite direction to begin another set of attacks. In sum, this gesture shows how *Four Organs*, like other phase-as-process works, has an initial presentation of an idea which, in this case, is predominantly rhythmic and is subjected to a process.

Video 2.2 Steve Reich, *Four Organs*, opening gesture, 0:00–0:18. ([Video](#))
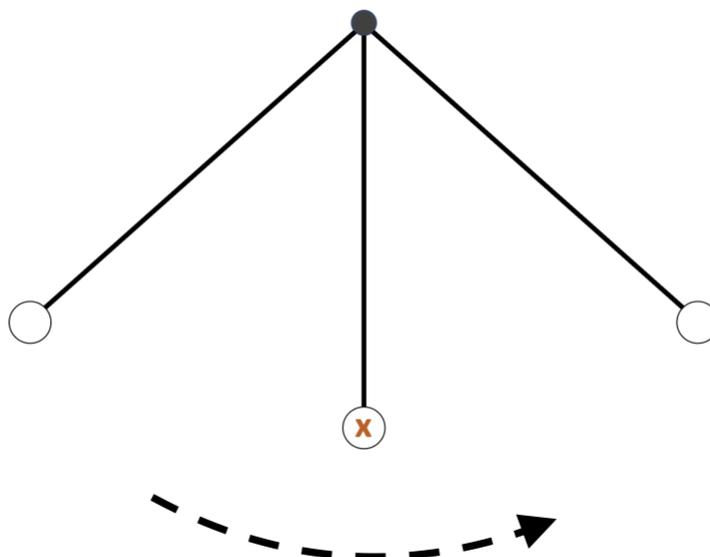
Video 2.2

Martin Ross
University of
Western Ontario

Hermeneutics of Steve Reich's *Four Organs*," in *Rethinking Reich*, edited by Sumanth Gopinath and Pwyll ap Siôn (New York: Oxford University Press, 2019), 19–52.

[117] Larson 2012, 143.

New material is introduced as remnants from the full dominant eleventh chord from attack x continues into y. Because the chord is not held entirely from x to y, the orange nodes become more transparent and disappear as the music rests. Notice how, in Video 2.3, x continues to remain when the nodes appear and disappear. Due to inertia, the nodes belong to x and thus x only disappears when y appears.

Video 2.3 Steve Reich, *Four Organs*, material introduced from x to y, 0:18–0:31. (Video)
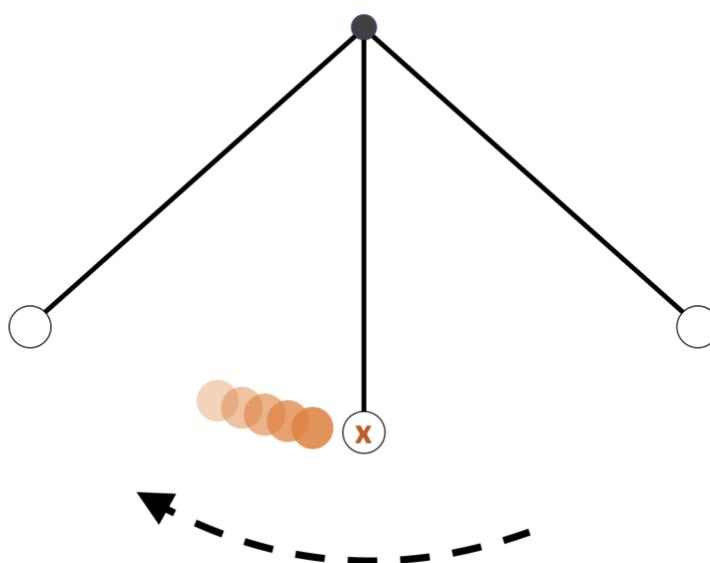
Video 2.3

Martin Ross
University of
Western Ontario

As y disappears and the direction changes, nodes appear before x to show notes being added to prepare for the full arrival at x. Video 2.4 shows new material added between y to x. Following this, Reich staggers the time points with the material between y to x, as shown in Video 2.5. This allows the opportunity for each separate entrance to be augmented later in the work. Video 2.6 shows the same type of motion from y to x. However, attack x is longer, and the x-to-y material following is closer in proximity to attack y.

Video 2.4 Steve Reich, *Four Organs*, new material from y to x, 0:43–0:55. (Video)
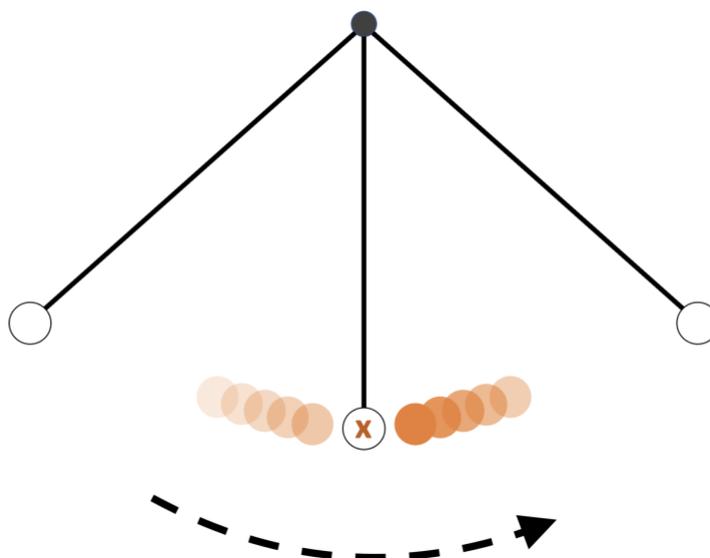
Video 2.4

Martin Ross
University of
Western Ontario

Video 2.5 Steve Reich, *Four Organs*, staggered entrances from y to x, 1:27–1:37. (Video)
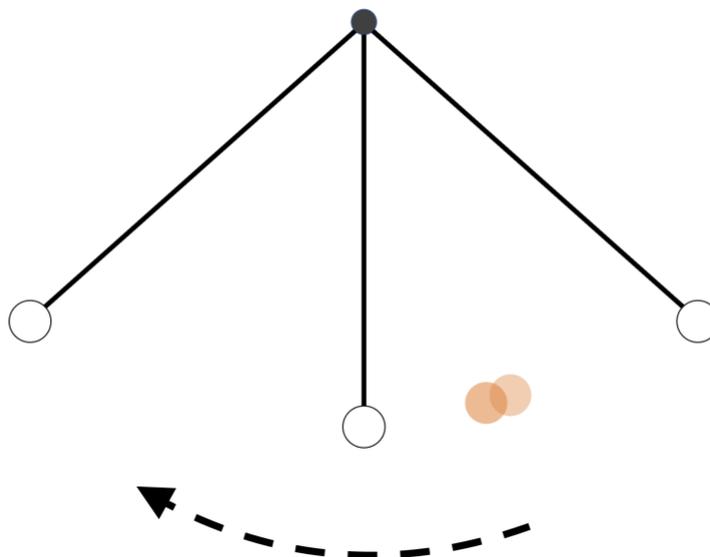
Video 2.5

Martin Ross
University of
Western Ontario

Video 2.6 Steve Reich, *Four Organs*, attack x is longer and x material is closer in proximity to y, 1:37–1:50. ([Video](#))
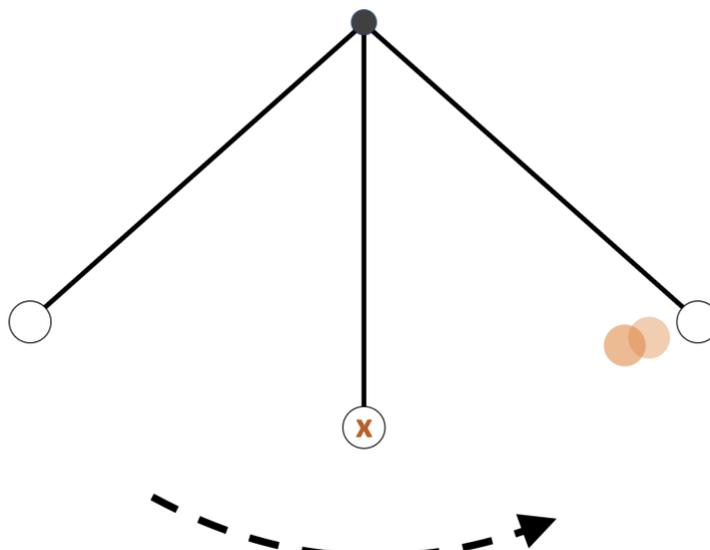
Video 2.6

Martin Ross
University of
Western Ontario

The next significant change occurs when y is no longer fully articulated, as shown in Video 2.7. In other words, Reich only relies on one attack of the full chord to continue the process. However, the formal location can still be surmised through the release of attack x; again, x disappears when y appears. Thus, "implied (y)" shows the disappearance of x and the change in direction. As a result, implied (y)'s location is more formally ambiguous because it is less aligned with the directionality than it was previously with its y proper counterpart.

Following the removal of y, Reich lengthens attack x, thus making the time between implied (y) to x shorter. There is also no remnant material from x to implied (y). Rather, it is just the full chord. This makes the formal area implied (y) even more ambiguous. However, as shown in Video 2.8, the implied (y)-to-x material coupled with the downward gravitational pull helps rationalize the change in direction.

Video 2.7 Steve Reich, *Four Organs*, attack y is removed, 2:10–2:23. ([Video])
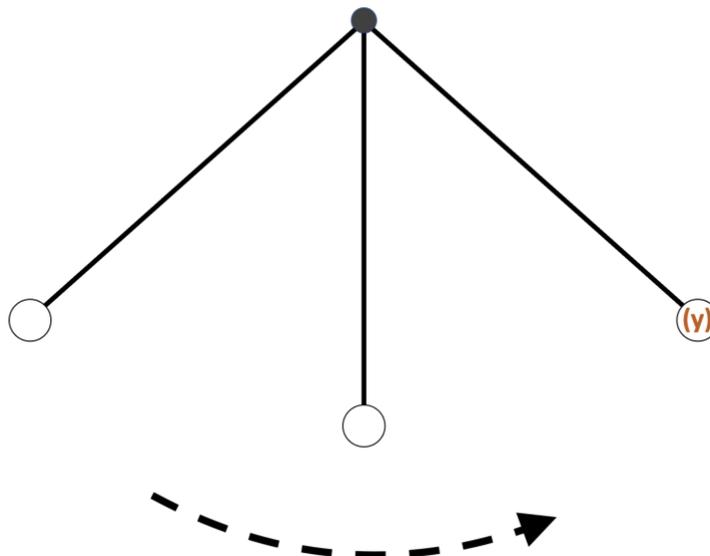
Video 2.7

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University of
Western Ontario

Video 2.8 Steve Reich, *Four Organs*, attack x is lengthened and the time span between (y) to x is drastically shorter. No clear presence of (y), 3:56–4:07. ([Video])
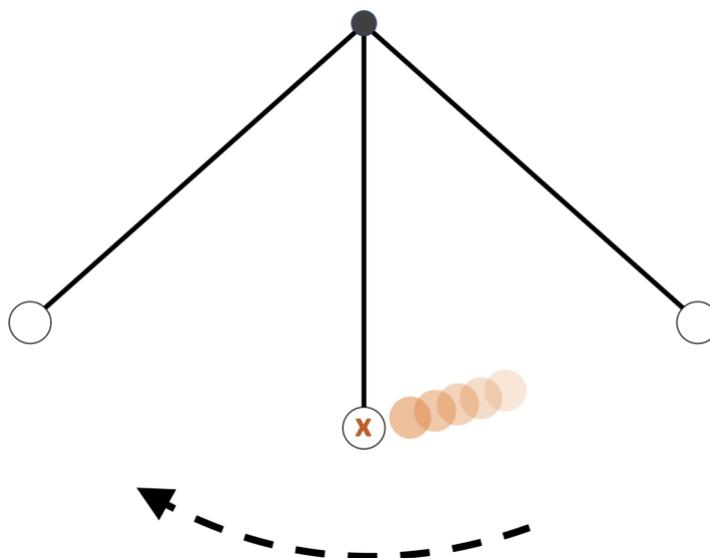
Video 2.8

Martin Ross
University of
Western Ontario

All the compositional steps to this point have prepared for the second large-scale section of *Four Organs*. The remaining material, and thus the remaining gestures, operate as such: additive notes lead into the full chord x, the full chord is played, and then the notes are removed until arriving at an E–A dyad before repeating the same process. This is where the work is subjected to temporal augmentation and will undergo the steps metaphorically equivalent to *Pendulum Music*'s. Because Reich's goal in *Four Organs* was to create "a sort of slow-motion music,"[118] the metaphorical pendulum must slow down just as it does literally in *Pendulum Music*. This is shown in Figure 2.4, where the outside nodes move closer to the middle.

Figure 2.4 Pendulum augmentation.

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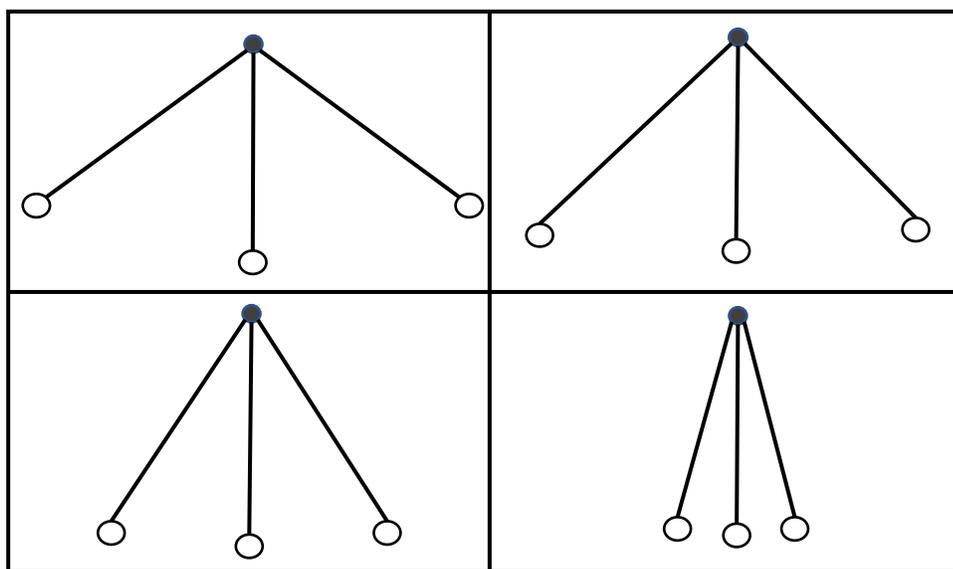
[118] Reich 2002, 50. Analytically, this work and *Pendulum Music* function in Byron Almén and Hatten's "slow-motion time," a type of "dissolution of temporality" defined by "extremely slow but otherwise unperturbed [stylistically constrained sequences] that nearly exceed our capacity to recognize them" as such. Byron Almén and Robert S. Hatten, "Narrative Engagement with Twentieth-Century Music: Possibilities and Limits," in *Music and Narrative Since 1900*, edited by Michael L. Klein and Nicholas Reyland (Bloomington: Indiana University Press, 2013), 66–69.

However, to keep the same formal and articulate representation, the metaphorical

pendulum will show the same distance of the outside nodes as was shown in the gestures

from the first part. As shown in Figure 2.5, this will be done by "zooming in" on every

moment the pendulum slows down. This allows the reader to conceptualize the pendulum

slowing down as well as keeping the same pendulum representations (i.e., same distance

between the nodes).

Figure 2.5 Metaphorical "zoom-in" of the pendulum.
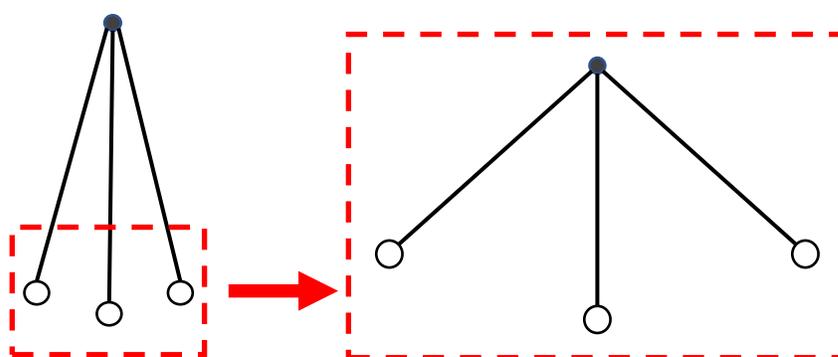
In the previous gesture (Video 2.8), the entrances were in close proximity and the

releases were evenly spread out. Figure 2.6 shows how temporal augmentation

metaphorically operates in *Four Organs*. Before the augmentation proper begins, Reich

first spreads out the lead-ins to approximately match the same rate of the releases (2.6a–

c). As both sides of x become evenly distributed (2.6c), the rate at which the lead-ins and

releases gradually slow down (2.6d). In actuality, Reich begins by slowing down the

release of x rather than its lead-in. However, the lead-in material is slowed down soon

after. In other words, Reich varies how the augmentation is distributed on either side of x,

yet the outcome is still equivalent to its literal pendulum counterpart. This representation

generalizes the music's temporal augmentation to match the same effect in *Pendulum*

Music.

Figure 2.6 Temporal augmentation.
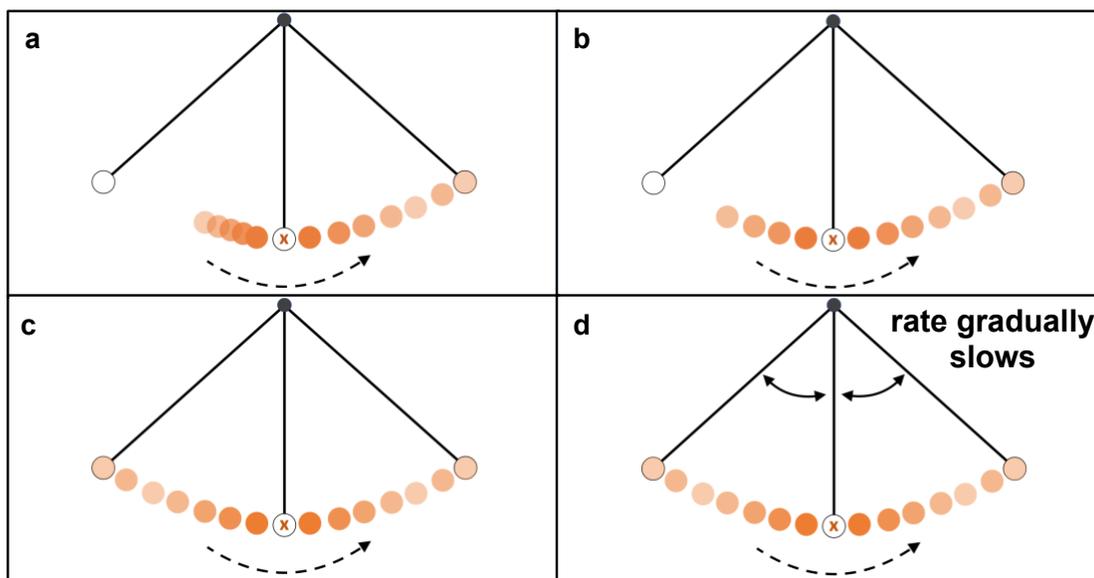
Video 2.9 shows the beginning of the temporal augmentation process, which is represented best by Figure 2.6a. Everything is considerably longer and there are very few temporal rests. The significant point of interest is the means by which Reich changes the direction at the respective outer node and moves back into x. The last remnant of attack x, an E–A dyad, not only acts as material arriving at the outer node, but it also acts as the beginning of the lead-in material to x. This clever elision by Reich makes it such that he can take the slightest break from the dyad and reintroduce the lead-in material to x. It also assures that the downward gravitational pull changes the directionality. The remainder of *Four Organs* consists of Reich augmenting the material further. Therefore, the same gesture found in Video 2.9 is a representation of the remaining music with the understanding that the work gets longer as the process moves forward. The lead-in to x becomes longer such that both sides are equivalent in length during one pass, and finally the notes augment on either side of x until Reich deems the work finished.

Video 2.9 Steve Reich, *Four Organs*, temporally augmented gesture, 5:48–6:15. ([Video](#))
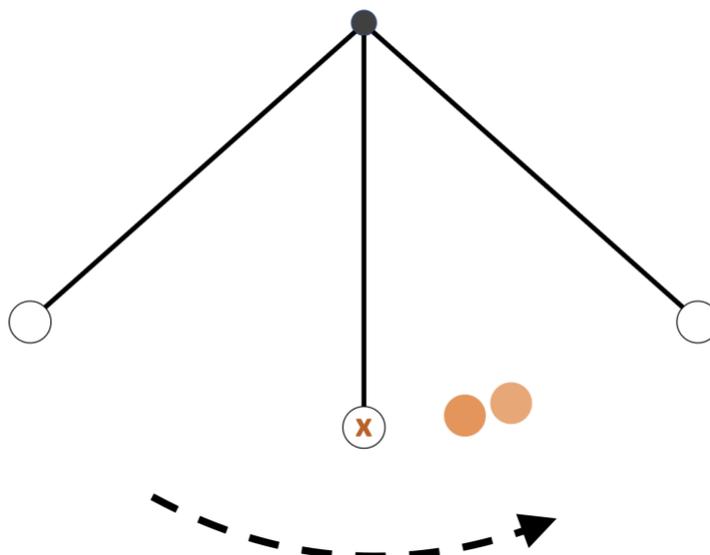
Video 2.9

Martin Ross
University of
Western Ontario

2.5.3 Closing

My animated representations of the gestures in *Four Organs* create a parallel to the process found in *Pendulum Music* by demonstrating how the musical forces of gravity and inertia guide it. This includes its movement from one end to the other, arrivals from the middle to opposing ends, and returning to the middle. To equate the process of a swing coming to rest, Reich began with two full iterations of the chord, followed by separate parts of the chord leading into either full iteration, and finally one full iteration undergoing a process of temporal augmentation. That said, there are two significant areas in this work's process: one is to set up the material to undergo temporal augmentation and the augmentation itself. Whereas the sounds in phase-as-process works can signify a flow in order for gesture to emerge, the sounds in *Pendulum Music* and *Four Organs* rely upon literal and metaphorical forces to signify the process. The animations to represent

the metaphorical qualities demonstrate the possibility of gestures emerging without the reliance of a score.

2.6 Conclusion

Reich's process music enables the listener to perceive the musical process through the music itself. Therefore, in the composer's own words, "I don't know any secrets of structure that you can't hear."[119] Naturally, such conditions are not appealing to the musical analyst who is driven by the challenges presented by "hidden" structures in music. Indeed, most writers point out the inadequacy of analysis for phase-shifting music and thus limit themselves to a mere description of process. This vein of writing depicts Reich's phase-shifting music as static, lacking in directionality and climax, and resistant to meaningful analysis. I recognize that an analyst looking for hidden structures in process music will encounter difficulties, especially since Reich explicitly states that they are not present. I hope my analyses, which might be equated to Roberto Saltini's perspective of an experiential type of analysis, demonstrates process not just as a "mere description," but as an element of a semiotic framework that can be used to gesturally interpret the process.[120]

Lastly, a referential framework reveals how the assertions previously discussed, some of which Saltini cites, are misconceptions. With the proper ontological understanding of process music, referential analyses can reveal significant attributes to Reich's early works that have not been considered. If one accepts that process music, not the musical process itself, is self-referential then it is no surprise that listeners and

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[119] Ibid., 35.

[120] Roberto Antonio Saltini, "Structural Levels and Choice of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Intégral* 7 (1993), 150.

scholars alike qualify process music as impersonal and directionless. Most analysts stop there due to associating the process music's own shortcomings with their own subsequent analysis. The stylistic novelty of process music stems from the fusion of form and content, but that fusion should not be construed as the only aspect of process music to merit analytical inquiry.

Moving on from process music, Reich began to create works with form and content as their own significant entities. Although he continued to use patterns, repetition, and the manipulation of parts against the meter to create rhythmic ambiguity, Reich works in the 1970s reveal a different composer. The next chapter will discuss the shift from a minimalist aesthetic to a minimalist style, and will present an agent of gestural signification absent from process music: the performer.

Chapter 3

The Minimalist Style: Articulate Gestures in Reich's Stylistic Works

Like many composers, Reich's compositions evolved. Starting in the 1970s, this included eliminating the form-content fusion at the foundation of his process music. No longer were his works rigidly predetermined and, more importantly, performers were no longer the agents of realizing the process. Because of the expanded role of the performer, Reich's works in the 1970s saw the beginning of a performance practice specifically tailored to Reich's needs. Thus, along with composing for larger ensembles, moving away from electronic to acoustic instruments, and focusing on the intricacies behind the pattern, the 1970s saw the beginning of a new minimalist style.

In this chapter, I discuss how the changes in Reich's compositional development subsequently affected the signifying roles of the composer, performer, and listener. Furthermore, with the new change in content, most notably with a focus on the pattern, comes new gestural interpretations. Whereas the preceding works were continuously developed, what I call Reich's "stylistic" works, a term deriving from Timothy Johnson's "minimalist style," were more formally articulate.[121] Finally, my analyses demonstrate how the performer is introduced as a component of gestural communication.

3.1 Reich's Minimalist Style

Although Reich moved away from process music, the underlying techniques followed him into the 1970s. Such techniques were adapted and refined for new types of

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[121] Timothy A. Johnson, "Minimalism: Aesthetic, Style, or Technique?," *The Musical Quarterly* 78/4 (1994), 748. Although all of Reich's works have individual stylistic tendencies, as does most music when broadly conceived, the works in this chapter are labeled in as "stylistic" because of Reich's efforts to establish a formative minimalist style.

applications. A common thread found in minimalist music scholarship is the discrepancy in terminology relating to Reich crossing over into a new style of composing. Some scholars will follow what Reich has said, some adopt terms from other methodologies, and some create new terms altogether. The result of this has been a misunderstanding of the terms with their subsequent mislabeling. Take the word "process" as an example. As Reich points out in "Music as a Gradual Process," he strived to create music in the 1960s that was literally comprised of processes. Thus, the term "process music" is defined as music guided by a process, with the main compositional formula to be a synthesis of predetermined form and content. Moving into the next decade, process is applied not by its use as a compositional formula but an explanation of the qualities behind his compositional techniques. In his discussion of *Drumming* (1970–71), for example, Reich explains that the work was the "final expansion and refinement of the phasing process," and that one of the four new techniques included "the process of gradually substituting beats for rests (or rests for beats)."[122]

An example of terminological discrepancies is found in Robert P. Morgan's analysis of *Music for Pieces of Wood* (1973), a work that uses Reich's build-up technique where rests are gradually substituted with beats. Morgan suggests that the work represents another stage of Reich's phase works and thus another process work. Rather than continuous phase shifts, the work consists of more salient, "abrupt phase shifts."[123] The salience is true, but the shifting is not reliant upon phase, which is a specific

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[122] Steve Reich, *Writings on Music: 1965–2000*, edited by Paul Hillier (New York: Oxford University Press, 2002), 64.
[123] Robert P. Morgan, ed., *Anthology of Twentieth-Century Music* (New York: W.W. Norton & Company, 1992), 435.

compositional technique to gradually shift a part against a constant to form a composite pattern. Next, according to Morgan, the work "is based on a constructive mechanism that, once set in motion, generates essentially automatically both the note-by-note succession and the overall form."[124] Reich's build-up technique involves the substitution of beats and rests. One of the main traits of Reich's phase-as-process works is that the note-to-note succession is literally consecutive: a shifting part gradually moves one note ahead in every moment of phase. This establishes a predictable, deterministic musical process. The build-up technique, by contrast, does substitute beats for rests, but it is not done in a literal, consecutive manner. The note additions, or new onsets, are chosen at different points within the measure in order to create new rhythms for every note addition. Therefore, the build-up technique does not share the same literal generative quality that phase possesses. In sum, Morgan's choice in terminology can affect the reader's understanding of *Music for Pieces of Wood* and consequently their understanding of its placement in Reich's compositional output.

3.1.1 Phase, resulting patterns, and compositional process

Another confusion lies in the distinction between processes guiding the work and techniques with their own inherent processes. Reich's *Violin Phase* (1967) was one of his first phase-as-process works for live instrument along with *Piano Phase* composed in the same year. However, *Violin Phase*, which uses a combination of live performance and tape, differed from *Piano Phase* because it had an additional component: the performer is instructed to bring out separate patterns within a composite pattern. Patterns derived from the composite pattern and played separately from them are known as resulting patterns.

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[124] Ibid.

As I discussed in Chapter 2, the performer's role in process music is to realize the process without any personal, subjective input so that an active listener can attend to the musical process. Given this, it is peculiar to have patterns that would inflect what Reich would consider "psychoacoustic by-products" in a work whose main purpose is not to explicitly contain them.[125]

Using resulting patterns along with his phase-technique in *Violin Phase*, Reich laid the groundwork for a bridge between his process music and his music beginning the 1970s. If we consider the two compositional elements, phase and resulting patterns, we will see that Reich shifts from its reliance on phase as *the* compositional process to simply *a* compositional process. For this reason, *Violin Phase* fits within Reich's process works because phase still motivates the underlying process. On the other hand, there are two works composed not long after *Violin Phase* that primarily use resulting patterns with phase as a compositional technique: *Phase Patterns* (1970) and *Drumming*. These works moved away from the rigidity of process music and began exploring new ways in which to bring more attention to the pattern, including more use of resulting patterns than phase. Instead of phase being used to go from one composite pattern to the next in an underlying process, Reich's phase-technique allowed new composite patterns to determine new resulting patterns.

Example 3.1 shows the beginning measures of *Phase Patterns*. Given its apt namesake, the work brings more attention to the treatment of the pattern than Reich had done previously. The patterns in this work are paradiddles which alternate left (L) and right (R) hand strokes: LRLLRLRR and RLRRLRLL.

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[125] Reich 2002, 35.

Example 3.1 Steve Reich, *Phase Patterns*, mm. 1–8.

Steve Reich "Phase Patterns"

Through phase, Organ 2 shifts its paradiddle by an eighth note in m. 4 and creates a new composite pattern with Organ 1 in m. 5. In the following two measures, Organs 3 and 4 enter with resulting patterns to play with the composite pattern.

I consider these three works as "stylistic hybrids," blurring the line between when Reich's process music ended and what follows. I will go into further detail of the significance behind the resulting pattern in my analysis of *Drumming*. The next section will explore the attributes that contribute to Reich's music being formed into what is deemed by Timothy Johnson as a minimalist style.

3.1.2 Five stylistic attributes

Robert Pascall defines describes musical style as a phenomenon in terms of its formal, textural, harmonic, melodic, and rhythmic attributes.[126] In defining the minimalist style, Johnson considers these five attributes to bring common ground among minimalist composers, developing their music "under one rubric."[127] In the context of Reich's music of the 1970s, I believe his style is established through several identifiable techniques that are not only found across several works, but also codifies them as recognizable attributes in his works moving into his postminimalist period.

Johnson describes the formal characteristics of the minimalist style as "primarily contiguous, often in the shape of an unbroken stream of rhythmic figuration from the beginning of the piece until it ends."[128] Reich's process music was contiguous and followed an unbroken stream of rhythmic variation, which might suggest that developing

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[126] Robert Pascall, "Style," *Grove Music Online* (2001), <https://doi.org/10.1093/gmo/9781561592630.article.27041>.
[127] Johnson 1994, 748.
[128] Ibid.

his music formally saw little change. However, the most striking formal attribute in Reich's music of the 1970s is one so nuanced that scholars still blur the line between where process music stops and new music begins: works were not dictated by one compositional process. Reich did not rely on the canonic use of phase relationships, for example, to dictate the directionality and outcome of the entire work. His only significant use of phase in this period was in *Phase Patterns* and *Drumming*. Form and content were disbanded to emphasize different kinds of changes, and such changes were still gradual in each work's development through the heavy reliance on repetition. However, the changes were not in service to an underlying process which determined form and content.

Due to the energetic activity that phase-as-process works exhibit, including multiple canons, contrasting rhythms, and contours from the composite patterns created, the dense texture in process music could be achieved with few instruments. While process works usually needed only two performers at most for a performance, Reich's music in the 1970s called for a variety of different types of ensembles.[129] In terms of instrumentation as it affects texture, the main shift from Reich's minimalist aesthetic in process music to a style found in the 1970s was the confirmation of using live performers who specifically used acoustic instruments instead of electrical instruments. Again, each of Reich's works moving into the mid-1970s had its own unique ensemble of the number of musicians needed, and most of the works required more members than the preceding process works of the 1960s.

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[129] This was in part determined by the group members of Steve Reich and Musicians. See William Duckworth, *Talking Music: Conversations with John Cage, Philip Glass, Laurie Anderson, and Five Generations of American Experimental Composers* (New York: Schirmer Books, 1995) [Reprint: New York: Da Capo Press, 1999], 306.

For Johnson, harmony in the minimalist style was limited to diatonic collections and the presentation of uncomplicated sonorities to a slow harmonic rhythm.[130] As the previous chapter showed, *Four Organs* was the only notable work in Reich's process music to employ a harmonic sonority, and it was limited to a single dominant eleventh chord. In his 1970s works, Reich shifted his harmonic vocabulary from a singular employment to plural. When discussing the harmony in *Music for 18 Musicians* (1974–76), which had the most harmonic activity and considered the stylistic culmination of what he did previously, Reich states that there is more harmonic movement in the opening *Pulses* section than in any of his previous works.[131] This harmonic movement is, however, limited to shifts in register, inversion, and general revoicing. The harmonic activity in *Music for 18* far from suggests a tonal syntax found in European common-practice music, but it does show progressions going from one vertical sonority to the next in a short period of time—a technique dating back hundreds of years yet never seen in previous works by Reich.

Johnson relegates the importance of melody in his explanation by summing it up in one line: "extensive melodic lines are entirely absent."[132] What would be the closest semblance of melody in Reich's stylistic works are determined more so by their rhythmic characteristics than they are by the combination of duration, contour, accents, and so forth. Melody can be considered in terms of how Reich chooses the notes in his rhythmic patterns for pitched instruments. This would include, for example, the marimba and glockenspiel parts in *Drumming*, and the winds, strings, piano, and marimbas in *Music*

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[130] Johnson 1994, 748.
[131] Reich 2002, 87. Henceforth abbreviated as *Music for 18*.
[132] Johnson 1994, 748.

for 18. However, their parts are very conservative in their voice leading, usually stepwise motion, and in their range, usually one octave of music. Again, this suggests that the focus is on the rhythmic, not the melodic, aspect of the pattern.

Finally, Johnson characterizes rhythm as ubiquitous repetitive patterns, and their organization, combination, and individual shapes provide the primary points of interest in the minimalist style.[133] As discussed in the previous chapter, the change in rhythms in process music, either by phase or augmentation, was the primary focal point. They relied on fixed, relatively short rhythms or patterns to convey the process realization. Moving forward, Reich's patterns became longer, which made them more susceptible to different compositional techniques. The choice and configuration of patterns (i.e., the organization of attack onsets and rests) were in part due to his exposure and study of West African drumming music, as discussed below, where a fixed bell pattern (played by a *gankogui* or *atoke*, for example) would accompany fixed clapping patterns and looser lead drum patterns. Works including *Clapping Music*, *Music for Pieces of Wood*, and *Drumming* all follow a longer pattern that are derived from a bell pattern. Again, both pitched and unpitched rhythm remained the primary attribute in Reich's music.

Although Johnson's descriptions of the stylistic attributes are meant to encompass the style of multiple composers, they shed light on how Reich adapts and shifts from the rigid procedures of process music into the development of works with more formal, textural, harmonic, melodic, and rhythmic variety. Rhythmic patterns became longer, the music was not subjected to an overall process, a plural usage of harmonic sonorities was employed, and primarily acoustic instruments were used in Reich's minimalist style. This

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[133] Ibid.

laid the groundwork to what would be the conventionalized techniques that are abundant in works later to come.

3.1.3 Non-Western music

In his book *The African Imagination in Music*, Kofi Agawu cites four components of ensemble playing that illustrate "the motivations for ensemble performance and the contributions of different media and techniques."[134] These include handclapping, time lines, polyrhythmic textures, and lead-drum narratives. Agawu further explains that Reich's works—most notably *Clapping Music*, *Drumming*, *Music for Pieces of Wood*, and *Music for 18*—qualify as "African" music and primarily use time lines as the main "process" that motivates these works. Agawu defines the time line as "a short rhythmic pattern normally entrusted to the bell (or castanet, sticks, or stone) and played as an unvarying ostinato throughout a particular dance drumming."[135] The time line is also known as a bell pattern, guide, phrasing referent, or *topos*.

Compositionally, time lines, in the form of patterns, and their development, offered Reich a longer form of ostinato than was previously used in his process works. As discussed in the shift from aesthetic to style, process works were driven by shorter patterns that were either determined by Reich himself, such as *Melodica*, which was thought of in a day, or by the emergence of rhythm found in speech. Longer patterns gave Reich the means to take a potentially equal, 12-beat section of music, set up an initial pattern of onsets and rests, and subject it to phase or phase shifts, build-up or removal, composite patterns, and an additional layer of rhythmic patterns resulting from composite

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[134] Kofi Agawu, *The African Imagination in Music* (New York: Oxford University Press, 2016), 169.
[135] Ibid., 172

patterns.[136] Lastly, patterns allowed Reich to conceptualize the potential for multiple

downbeats or meters, effectively creating rhythmic ambiguity.

West African drumming undeniably played a role in the development of Reich's

minimalist style.[137] The question still arises as to the degree to which West African

drumming played a role. Was it influence, borrowing, or appropriation? Reich has made

it clear in his writings that the exposure and study of West African music confirmed his

intuition that acoustic instruments, specifically percussion instruments, would provide a

richer texture than electronic instruments. Furthermore, Reich was interested in

implementing the structural components of non-Western music into his Western

compositional practices:

> One can study the rhythmic structure of non-Western music and let that study lead one where it will, while continuing to use the instruments, scales, and any other sound one has grown up with. This brings about the interesting situation of the non-Western influence being there in the thinking, but not in the sound. This is a more genuine and interesting form of influence, because while listening one is not necessarily aware of some non-Western music being imitated. Instead of imitation, the influence of non-Western musical structures on the thinking of a Western composer is likely to produce something genuinely new.[138]

Reich's perspective suggests that his implementation of West African music is found

primarily in the underlying structure of his music. His thinking was encouraged and

confirmed by West African music, but the sound produced was Western.

Reich's *Drumming* and West African drumming also share a similar communal

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[136] Removal, where beats are substituted with rests, is equivalent to Hartenberger's term "deconstruction." See Russell Hartenberger, *Performance Practice in the Music of Steve Reich* (New York: Cambridge University Press, 2016).

[137] Balinese gamelan was also a music from which Reich drew influence, using Colin McPhee's book *Music in Bali* as a resource (Reich 2002, 106). See Colin McPhee, *Music in Bali* (New Haven, CT: Yale University Press, 1966).

[138] Reich 2002, 71.

function through ensemble performance. The difference is that West African drumming,

rhythmically speaking, has all four components that Agawu cites. There are layers of

rhythm that range from strict patterns to freer "narrative-driven" patterns. What Reich

does instead is focus on the time line. If Agawu is correct in that Reich's music is

"instructed by African materials," which I agree with, and that the primary material

which Reich's music of this time is built upon is time lines, then it would not be

unreasonable to say that Reich's style was truly minimalist in that the sole, structural use

of time lines in the form of patterns was intentional.[139]

    Although the choice to primarily adopt time lines in his structural thinking might

suggest "cherry picking" from another culture for his music, Reich was aware of West

African drumming's cultural significance. This included choosing not to use African

instruments in his works because such instruments "[had] their own history and purpose,"

and the "exportable" structures of African (and Balinese) music could be applied to

Western instruments.[140] Furthermore, Agawu points out that Reich's choice to subject

West African structures to his own "marked structures or tactics" is meant to be "put on

display for all to see."[141] Again, Reich believed that the influence in the form of the

structure over the sound was more genuine.

3.2 Performance Practice in Reich's Music

    Although Chapter 2 revealed that the listener infers gesture in process music,

scholars like Naomi Cumming, David Lidov, and Robert Hatten cite the necessity of a

performative element in gestural emergence. A gestural result from a performer, for

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[139] Agawu 2016, 322–23.
[140] Reich 2002, 106–107.
[141] Agawu 2016, 322.

Cumming, is "a middle point that reflects both the performer's characteristics as a musically trained 'mover' and also enacts the subjective potentialities of the shaping observable in the score."[142] In defining gesture through its communicative function, which applies to the performer, Lidov plainly states, "Gesture is a temporal shape set by an instantaneous condition."[143] Finally, in Hatten's perspectives of musical gesture as a concept, he states musical gestures "have meaning that is both complex and immediate, and often directly motivated by basic human expressive movements."[144] All of these characteristics are driven by the human element of expressing gesture. All three scholars write about the importance of movement within the gesture. This section will outline the necessary qualities in which a performer must consider in order for their actions to be deemed significant and therefore can successfully convey gesture.

As the composer relinquished control to the listener when inferring gestural emergence in process music, the performer now takes over such responsibility. Thus, the question arises: what does performative control look like in Reich's stylistic works? In his book on performance practice in Reich's work, original Steve Reich and Musicians member Russell Hartenberger discusses the nuances that performers should consider when approaching Reich's works, primarily in the 1970s. Hartenberger's book provides a first-hand perspective of the decisions that went into performing works in Reich's minimalist style.

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[142] Naomi Cumming, *The Sonic Self: Musical Subjectivity and Signification* (Bloomington: Indiana University Press, 2000), 137.

[143] David Lidov, "Mind and Body in Music," *Semiotica* 66 1/3 (1987), 77.

[144] Robert S. Hatten, *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert* (Bloomington: Indiana University Press, 2004), 94.

Hartenberger considers two different elements in his playing that differed to the traditional Western canon. The first was the consistency in his attacks:

> As I discovered, this kind of control and consistency of strokes was extremely important in performing repetitive music on percussion instruments. Part of the virtuosity in playing Reich's music is in keeping the attacks consistent on each instrument and throughout the piece. This allows the listener and the player to hear patterns that are repeated for an extended period of time in different ways and creates the interest in pulse-based repetitive music.[145]

Striving for evenness and consistency is important because Reich's type of composing, especially in *Drumming*, has an inherent sense of ambiguity. The patterns on their own are of little interest, as the initial presentation of a pattern functions as the presentation of a constant. However, a layer of resulting patterns above a composite pattern, for example, provides rhythmic variety that does not need accents and dynamics to cloud, hide, or conceal where the ultimate downbeat is. Arthur Morris Jones, whose work Reich studied before going to Ghana, discusses the effects of unaccented notes in African music:

> The claps carry no accent whatever in the African mind. They serve as a yard-stick, a kind of metronome which exists behind the music. Once the clap has started you can never, on any pretext whatever, stretch or diminish the clap values. They remain constant and *they do not impart any rhythm on the melody itself*. The rhythm of the melody is derived partly from the rhythm of the words as they would normally be spoken, and partly from the rhythm naturally produced by imitative sequences and, as in the West, by the whole build of the tune.[146]

The value of the clap is unchanging and thus does not affect strong or weak placements in any part of the melody. For Reich, an even value in his attack thus leaves the patterns to their own natural rhythmic devices: patterns are layered in such a way to provide their own rhythmic ambiguity without the need for accents.

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[145] Hartenberger 2016, 32.

[146] A.M. Jones, *Studies in African Music*, vol. 1 (London: Oxford University Press, 1959), 21, emphasis in original.

The second significant element to Hartenberger's performance practice was the physiological awareness of his playing:

> While performing *Drumming*, I also found that I had to be comfortable enough with the rhythmic patterns to the point of detachment from the physical action of playing while concentrating on interlocking precisely with the other part. I discovered ways to relax and to shift energy away from points of tension in order to continue playing at a consistent volume for a sustained period of time. These were physical tools that I developed in order to have the proper technique to perform the music.[147]

The idea of physical detachment to one's playing can interpreted as a potential disruption to the performance and thus the communication to the listener. As discussed in Chapter 2, the listener can best infer gesture if they adopt a mode of listening, specifically attentive awareness, that allows for gestures to emerge from the music. A performer like Hartenberger can maintain enough control, which consists of disregarding any accents or phrasing when performing patterns, to the point where they not only play their part consistently, but they also listen for the relationships to other parts. What may seem like a detailed way of describing knowing one's part has more meaning given the fact that it is in service to Reich's compositional style.

The physiological detachment also allows players the ability to hear what patterns are coming through. This is especially applicable to resulting patterns, something I will discuss in further detail in my analysis of *Drumming*. Thus, playing composite patterns not only should be even in the sound but also clear. This allows for the other patterns to emerge from the texture and be audible for both the performer and the listener.

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[147] Hartenberger 2016, 32.

3.3 Gesture

One of the most significant shifts in Reich's move towards a minimalist style is the performer's role in the work's gestural activity. Whereas the minimalist aesthetic in Reich's process music could not allow the performer to accentuate or highlight important moments, as that would disrupt the process itself, Reich's stylistic works need a performative mediator. Before I discuss the performer's role in Reich's music specifically, it is important to outline the performer's gestural function.

Gesture in performance has largely been discussed as being communicative. David Lidov defines gesture in the performative realm as having a "privileged status in the expression of the somatic states."[148] The more expression that the performer makes, the more likely a gesture will emerge for the listener to infer. Furthermore, for Lidov, the communication of gesture from the score is found in the expression of iconic, indexical, or symbolic articulation. This articulation, not to be confused with the term's performative application, considers overall divisions of a whole. The articulate icon is "a particular arrangement of articulated materials, an arrangement which may be interpreted as the isomorph or tract of some object or force immediately in contact with it." The articulate index is the direct expression of articulated materials that "[represent] an immediate mutual influence of body and sound."[149] Lastly, the articulate symbol identifies relationships of articulated materials.

3.3.1 Signifying style

In his book *Elements of Semiotics*, Lidov discusses the context for each part of the

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[148] Lidov 1987, 76.
[149] Ibid., 73.

representamen-object-interpretant triad. The contexts of representamen are its medium and structural environment, the context of an object is its world, and the context of an interpretant is a perspective.[150] Our interpretation of the musical object, represented accordingly, is motivated by our perception of it. Focusing on the interpretation, Lidov explains, "A group of signs may be interpreted in a way that expresses a unity (be it of feeling, of attitude, of situation, of argument, or whatever)...Among our most general terms for such unities are 'personality' and 'style.'"[151]

Our focus for gesture in this chapter is thus the interpretation of a unity of signs defined as the minimalist style. This brings me to some retrospective insight: process was definitive enough to *be* the minimalist aesthetic. The gestural interpretation of the signs in Reich's process music was dependent on the iconicity of the representamen. In other words, the sounds exhibited a likeness to process. For Reich's stylistic works, however, several compositional and performative aspects contribute to how the gestural interpretation is deemed to be stylistic.

Compositionally, Reich's works following his process music shifted the focus from the sound representing both form and content, as it did in process music, to the sound representing content. Particularly, the pattern becomes the focal point in regard to content in Reich's stylistic period. Patterns are no longer directly responsible for determining the form through a musical process. Instead, they are initially presented as singularities that develop rhythmically, texturally, and dynamically. In turn, its development informs the form without the restricted parameters of a musical process.

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[150] David Lidov, *Elements of Semiotics* (New York: St. Martin's Press, 1999), 109–110.
[151] Ibid., 110.

Thus, patterns develop Reich's compositional output as a stylistic trait. As discussed above, Reich's patterns, subjected to different compositional techniques, provide content to be developed in a more salient and varied manner rather than in a continuous, generative, and predictable manner.

The performer, who was not a significant agent in process music, now has the responsibility to communicate the development of the music, specifically the pattern. How they make the music match Reich's style at the time is dependent upon the performance practice. As I discussed above, the amount of control that the performer has in the stylistic works, either through instruction or by rote, will be indicative of the traits spanning several works. These traits include even attacks, build-up pattern perceptions, build-up phrasing, and resulting pattern choices.

Interpreting the performed passage as a gesture is more nuanced in the stylistic period due to the performer's influence. However, the compositional choices and inherent qualities of the music itself are still derived from process music: consistent attacks and slow development through repetition are both as integral to Reich's works in the 1970s as they were in the previous decade. The difference is the new, more complex compositional development that required more active and considerate input from the performer. Thus, the performer's role in Reich's stylistic period is crucial for communicating and interpreting gesture.

Finally, a performance is stylistically accurate when the listener can create an interpretation that is consistent with the style. In his discussion on interpreting style, Lidov explains that "I am inclined to say that Mozart's style is the immediate perception I have of all his work that I know when I stand back far enough from it to perceive it as

one whole collection. That I may take this impression to represent his personality or his century or as a clue how to interpret a new score is secondary."[152] Ironically enough, one of the most oversimplified observations one can make in minimalist music is its simplicity. For example, that *Piano Phase* can be viewed in an equivalent stylistic interpretation as *Drumming* given their underlying minimalist principle of the use of few materials when composing. However, the difference in these works goes beyond sheer nuance; though their features heard on the surface are similar (e.g., repetition and phasing), their underlying structures are radically different. Said structures shifted from an experimental process to a more developed and articulate compositional design.

The gestural focus of this chapter elaborates on this distinction. I will explore how Reich's treatment of the work is more formally articulate. Specifically, I will focus on how the pattern is the central element to which Reich develops his style. Its significance will emerge from its treatment. The combination of these elements will create the unity of signs from which a stylistic interpretation can be made.

3.3.2 The significant pattern

The pattern is the most significant compositional aspect of Reich's minimalist style. Having derived rhythms from West African drumming, the types of presentations and development of a constant pattern are seen in every work in the 1970s. The performative terminology leans towards patterns and descriptions. For example, as was seen in process music, performers begin works with a unison pattern, one performer phases until it arrives at a transposed version of said pattern, subsequently creating an

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[152] Ibid.

aggregate known as a composite pattern. We will also see the appearance of the resulting pattern in the *Drumming* analysis, a pattern which further articulates composite patterns.

That said, all of these patterns are *rhythmic* by design. They present the listener with arrangements of beats. Rhythm in Reich's stylistic era can be conceptualized by its employment. First, consider instrumental employment. Works like *Drumming*, *Clapping Music*, and *Music for Pieces of Wood* are primarily percussion works. Although these works mostly use pitched percussion, thus presenting a melodic component, the timbre from struck acoustic instruments have more of a rhythmic priority than their contour. This is especially true in *Drumming*. I believe Reich's choice in pitched percussion is done to break the monotony of a singular pitch. *Clapping Music*, however, does seem to be an exception.

The primary rhythmic employment is compositional, where Reich strategically arranges patterns in such a way that brings attention to either a singular or group of performers. I will discuss this more in the *Music for Pieces of Wood* analysis. The point is that Reich employs patterns, not rhythms, in his works. Rhythmic variants, including composite patterns and resulting patterns, all share a common thread underneath the pattern label given their unique relationship.

Furthermore, Reich's choices in arranging the patterns will determine how he manipulates them later in the work. In his most recent article, Jason Yust labels Reich's 3+2+1+2 pattern as his "signature rhythm."[153] When interpreting it as a singularity, away from any compositional context, then this label would be fitting. However, when

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[153] Jason Yust, "Steve Reich's Signature Rhythm and an Introduction to Rhythmic Qualities," *Music Theory Spectrum* 43/1 (2021), 74.

comparing it with the West African Ewe pattern, labeled as the "standard pattern" by Yust, it is surprising to see that the signature rhythm is not labeled as the "signature pattern." It seems more accurate to explain a pattern having rhythmic qualities than a rhythm with the same thing. The pattern will have inherent qualities, but with all the terminology and attention towards the pattern, it is perplexing that Yust did not consider keeping the signature rhythm consistent with the standard pattern.

But perhaps this is the shortcoming to Yust's analysis: in the article's lack of focus to apply the rhythm (and the vigorous, mathematic qualities it possesses) back to the work in a practical manner (i.e., non-abstract), the "signature rhythm" will thus remain a rhythm and not a pattern. This contrasts with the Ewe standard pattern, which has a cultural application as well as musical. It does not diminish Yust's analysis, but it does present the shortcomings that rigid, at-times abstract analyses possess when compared to analyses of works in practice. Given the extensive use of the 3+2+1+2 onset combination in question, seen in several works in the stylistic era and following, I agree with Yust that it is indeed signature. Therefore, in the following analysis of *Music for Pieces of Wood*, I will label the pattern in question as the "signature pattern."[154]

3.4 *Music for Pieces of Wood*

My first analysis in Reich's stylistic works explores the build-up pattern in his 1973 work *Music for Pieces of Wood*. Like *Clapping Music*, this work utilizes the same 3+2+1+2 signature pattern but subjects it to a different compositional technique: the build-up pattern. Although Reich's earlier *Drumming* uses the same technique, among

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[154] Daniel Tones also uses the same label. Daniel Mark Tones, "Elements of Ewe Music in the Music of Steve Reich," DMA Thesis, University of British Columbia (2007), 56.

others, *Music for Pieces of Wood* exclusively focuses on Reich's treatment and development of the pattern, which functions as the constant to begin the work. As the work progresses, the signature pattern combines together with the build-up pattern in its different stages. This allows for an analysis solely focused on the patterns and its perception. I show that the stylistic choice of rhythmic ambiguity, achieved through even attacks, creates several subjective possibilities in how to interpret the patterns as they build up as well as become part of the composite pattern. What is arguably the first definitive work in Reich's stylistic era, *Music for Pieces of Wood* demonstrates how Reich can create simple articulate events and still invite multiple interpretations.

3.4.1 The work

Although composed later than *Drumming*, Reich's *Music for Pieces of Wood* takes a more simplistic approach to the treatment of patterns and thus creates a simpler work for five clave players. The work is divided into three sections, one in 6/4, one in 4/4, and one in 3/4. Along with the Clave 1's constant pulse, Clave 2 plays the constant pattern. Figure 3.1 shows Clave 2's constants in each respective section. While beginning with the signature pattern in the 6/4 section, Reich removes material while shifting to the new sections.

Figure 3.1 Steve Reich, *Music for Pieces of Wood*, Clave 2's constant patterns.

The first two beats in the 6/4 measure are removed to make the 4/4 section, and the second beat in the 4/4 section is removed to make the 3/4 section. At the same time,

Reich maintains patterns with a palindromic distribution of onsets: 3+2+1+2, 2+1+2, and 2+2.[155]

Whereas time signatures typically have an implied rhythmic division, I interpret the signatures in *Music for Pieces of Wood* and other stylistic works of Reich's as simply the number of beats given by the time signature "numerator" that he can fit a pattern within. For example, the 6/4 section simply means that there are six quarter-note beats which Reich can fit a pattern. Coupled with even attacks, there is little need to indicate strong or weak beats. Thus, the more focus there is on the pattern rather than the meter, the more likely rhythmic ambiguity will present itself for the listener.

Claves 3–5 create build-up patterns as such: as the constant pattern (Clave 2) plays with the pulse (Clave 1), Clave 3 enters with a single onset. Example 3.2 shows Clave 3's build-up in the 6/4 section. After an agreed-upon number of repeats, Clave 3 moves into the next measure where a rest is substituted with a beat, creating an additional onset. This continues until Clave 3 has matched the same number of onsets as Clave 2: eight onsets in the 6/4 section, five in the 4/4 section, and four in the 3/4 section. After Clave 3 matches the volume of Claves 1 and 2, Clave 4 enters and repeats the same build-up compositional process. The final patterns will always be transpositions of Clave 2's constant pattern. Also, every time Clave 3–5 complete their pattern, they create a thicker composite pattern texture.

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[155] The 6/4 pattern is symmetrical when accounting for the repeat: 3+2+1+2(+3). This subsequently creates a type of elided symmetry.

Example 3.2 Steve Reich, *Music for Pieces of Wood*, mm. 1–10.

Steve Reich "Music for Pieces of Wood"
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Figures 3.2–3.4 show Claves 3–5s build-ups in each respective section. Though all three parts play their build-ups consecutively, which is expressed in their respective measure numbering, the parts in Figure 3.2–3.4 are presented simultaneously so that the similarities between the parts can be identified and broken down. These similarities include the choice includes the final pattern, the build-up order, and the position of a new onset (i.e., the interval between the new onset with the ones already present). All the final patterns will be some sort of transposition of Clave 2's constant pattern. Claves 3 and 4

share a t_6 transposition in the 6/4 section but differentiate in the latter two sections.[156] In the 4/4 section, Clave 3 has a t_2 transposition and Clave 4 has a t_4 transposition, shifting by a quarter-note interval. In the 3/4 section, Clave 3 has a t_1 transposition and Clave 4 has a t_2 transposition, shifting by an eighth-note interval. The quarter-note and eighth-note intervals means the Clave 4 always shifts twice as far as Clave 3.[157] In contrast with Claves 3–4, Clave 5's final pattern will always be in unison with Clave 2.

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[156] I adopt John Roeder's lowercase t_n to represent beat-class transposition to better differentiate it from the capital T_n that is typically used in pitch-class transposition. Duker also adopts this approach in his analysis of *Drumming*. See John Roeder, "Beat-Class Modulation in Steve Reich's Music," *Music Theory Spectrum* 25/2 (2003), 278.

[157] Again, these intervals are not tied to a metric hierarchy. Rather, the quarter note and eighth note are used as succinct measurements of distance.

Figure 3.2 Steve Reich, *Music for Pieces of Wood*, Clave 3–5, 6/4 section build-ups.

Figure 3.3 Steve Reich, *Music for Pieces of Wood*, Clave 3–5, 4/4 section build-ups.

Figure 3.4 Steve Reich, *Music for Pieces of Wood*, Clave 3–5, 3/4 section build-ups.

Determining the arrangement of substitutions can reveal equivalent build-up orders in the same or different positions. Analyzing the build-up order involves numbering the onsets in order of their appearance. An example of similar build-up orders is found in Claves 4 and 5 in the 6/4 section. The build-up orders, where the notes ordered from beginning-to-end in the final pattern, is [1,3,7,8,2,4,5,6] in Clave 4 and [8,2,4,5,6,1,3,7] in Clave 5. The transposition label accounts for the rhythmic position within the measure (mod-12 in 6/4). Thus, Clave 5 has a t_6 relationship to Clave 4, or Clave 5's build-up order begins roughly in the second half of the measure in relation to Clave 4's order. This creates two relationships regarding Clave 4's pattern: its final pattern is equivalent to Clave 3, and its build-up order is transpositionally equivalent to Clave 5.

Another similar relationship is different build-up orders, but similar rhythmic patterns within the measure. For example, Claves 3–5 in the 3/4 section have similar build-up orders in different positions within the measure save for Clave 5's second build-up measure (m. 57). In this measure, Reich takes advantage of the even distribution of beats and rests, with one eighth-note onset followed by two eighth-note rests. How Reich differentiates from this is the initial onset positions (see Figure 3.4, mm. 48, 52, and 56).

Lastly, in composing the build-up patterns, Reich presents common threads within his treatment of consecutive onsets, where there is no rest between two onsets. All three sections will have areas with two-note consecutive onsets, which I will call onset pairs. Figure 3.5 identifies where the onset pairs first enter, in Clave 3's part in the 6/4 section. Onsets are identified as integers above the staff and onset pairs are labeled OP below the staff.

Figure 3.5 Steve Reich, *Music for Pieces of Wood*, Clave 3's onset pairs, 6/4 section.

The onset pair order is expressed as [xy] with x and y expressing the onset integers. In Claves 3–5's build-ups in the 6/4 section, the second onset y will always follow the first onset x (i.e., $y > x$). OP1 will always be created in the fourth build-up measure (mm. 6, 14, and 22). Whereas the onset pair in Clave 3's in OP1 is [14], Claves 4 and 5 share an OP1 order of [24] . Claves 3–5 share the same OP2 order of [56], which is always in the sixth build-up measure (mm. 8, 16, and 24). All three parts also share the same OP3 order of [37], which is always in the seventh build-up measure (mm. 9, 17, and 25).

Finally, OP2 in the 6/4 section is given an additional consecutive onset in the final build-up measure (mm. 10, 18, and 26), creating an onset order of [568]. The most common trait in Reich's works which use the build-up technique is saving the final substitution with the most consecutive onsets for last. This also occurs in the 4/4 and 3/4 sections, where the maximum number of consecutive onsets is two. Though simplistic in its design, Reich creates several unique relationships between the parts in *Music for*

Pieces of Wood. This preliminary analysis revealed how Claves 3–5 relate in the abstract, remembering that they never play simultaneously but consecutively against the Clave 1 pulse and Clave 2 constant pattern and subsequent composite patterns in the case of Claves 4 and 5. I will now turn to how the different patterns interact with each other in real time and how a subsequent gestural emergence is possible.

3.4.2 The composite pattern and textural repetition

The actions that performers take to realize the score's potentialities and make them actual can be defined as indexical. These actions indicate the performer's choices before and during the performance. In Lidov's words, "The immediate expression of physiological values in sound as performed nuance is indexical."[158]

In his writings on musical repetition, Lidov outlines three referential types: a formative repetition that interprets what is repeated, a self-referential focal repetition, and a textural repetition "which points away from the repeated material to other musical signs while, at the same time, influencing their quality."[159] Textural repetition in *Music for Pieces of Wood* and other Reich works are commonly found in the composite pattern, which combines the pulse, the constant pattern, and transposed patterns depending on their location in the music. Every subsequent build-up pattern will have a denser composite pattern. Clave 4, for example, will have a denser composite pattern when it progresses with its build-up than when Clave 3's does its respective build-up; the same goes for Clave 5's build-up compared to Clave 4's.

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[158] Lidov 1987, 74.
[159] David Lidov, *Is Language a Music?: Writings on Musical Form and Signification* (Bloomington: Indiana University Press, 2005), 29.

The composite patterns in the 6/4 section are shown in Figure 3.6. The former's texture becomes denser with every new addition, and by the addition of Clave 3's full pattern added in m. 11, the composite pattern creates a measure of consecutive eighth notes.[160]

Figure 3.6 Steve Reich, *Music for Pieces of Wood*, 6/4 section, composite patterns.

It is important to note that although Clave 5 does complete its build-up pattern and joins into the composite pattern, it never functions as part of the textural repetition due to the fact that there is no build-up pattern following. After Clave 5's completion in m. 26, Claves 2–5 move into a unison in m. 27 before starting the 4/4 section in m. 29.

The number of designated repetitions at the beginning, as shown in Example 3.2, fits textural repetition's behavior, elaborated by Lidov as such:

> Textural repetition occurs with the continuing repetition of an idea more than three or four times, which cancels out its own claim on our attention and thereby refers our focus elsewhere, to another voice or to a changing aspect. The figure maintains, nevertheless, a background influence on our musical consciousness.[161]

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[160] The location of each addition to the composite pattern is the measure following the completion of the build-up pattern. This allows for the build-up pattern to end in one measure and join the composite pattern in the following measure. For Clave 2, this means the measure following its initial presentation.

[161] Lidov 2005, 35.

The composite pattern is continuously maintained while a build-up pattern develops, making its repetition saturated enough to direct one's attention to the build-up. Reich confirms this for every layer added to the composite pattern by his simple treatment of dynamics. Whereas Claves 1 and 2 maintain a *forte* dynamic throughout, Claves 3 and 4 begin their onsets at *fortissimo*. Once their build-up patterns are finished, their dynamic diminishes to a *forte*, matching the volume of the rest of the composite pattern.[162] This is a common trait found in Reich's stylistic works and will be discussed further in the *Drumming* analysis.

Coupling the composite pattern's repetition with its volume indexes the listener to direct their attention elsewhere. However, as Lidov cites, the background influence of which the figure maintains—in our case, the pattern being the figure—still plays a role in how the listener will qualify both the composite pattern and the other material the former is supposed to index. Citing Erik Satie's *Vexations* and Maurice Ravel's *Bolero*, Lidov explains that although textural repetition is meant to divert attention away from the repetition, it still has control over the listener, saying, "We resist the change of reference."[163]

Music for Pieces of Wood's development is simpler but analogous to *Bolero*'s. The latter's snare drum ostinato is always present, and the development of the melodic figure through different instruments creates layers much like the build-up pattern. The difference is that once instruments are finished with the melodic figure in *Bolero*, they join in with the snare drum's ostinato in rhythmic unison. The melody is not derivative of

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[162] Clave 5 also begins *fortissimo* but, again, it is not applicable to the work's textural repetition.
[163] Lidov 2005, 36.

the ostinato, and there is no transpositional layering of the snare drum's ostinato rhythm. The result is strong and dense textural repetition in unison.

The question is, then, does the textural repetition in *Music for Pieces of Wood* create a similar resistance? The uniformity in volume indicates a localized completion, yet Reich does not allow the listener to stay on this completion for long. He either moves to another build-up, transitions into the next section, or ends the work. The articulation of these moments of completion is quick, salient, and straightforward. Just when the listener feels comfortable, Reich directs their attention elsewhere. Reich therefore minimizes the resistance of a listener's attention toward the textural repetition because he wants them to continuously engage with the music in real time.

However, how the repetition changes the quality of the build-up is unique in that it offers the listener a choice: allow their perception of the build-up to homogenously interact with the composite pattern or allow the build-up to heterogeneously develop against the composite pattern. The former perception is vertical, and the latter is linear. The work's formal design allows the listener to easily follow which clave part plays their build-up against the composite pattern whose texture becomes increasingly dense. This largely involves the clave's vertical interaction with the composite pattern and the emergence of a linear pattern.

In other words, when does the build-up become a recognizable pattern? The build-up pattern figuration is consistent in all three sections. By the third build-up measure in each section, we see two onsets in close proximity and one further away. By the fourth build-up measure, the listener has familiarized themselves with the substituting part of the build-up, and the rhythm has enough onsets for the substitutions not to be

considered spontaneous. Instead, the pattern grows with more onsets either before or after the listener perceives to be the starting point of the pattern.

3.4.3 Four build-up arrangements (or, how to phrase the pattern)

Given the significance of the pattern compared to the meter, the substitution locations in the build-up have the possibility of creating an effect where a listener will establish their own downbeat compared to what is originally notated. In other words, it is possible for the listener to rearrange the pattern compared to what is notated in the score. The listener's choice of which part of a pattern the "one" is located is entirely dependent on their perception. I propose three different kinds of build-up rearrangements that a listener can create using Clave 3's build-up in the 6/4 section. This is shown in Figure 3.7.

All three rearrangements have two things in common. First, as discussed at the end of the previous section, the rearranged patterns will still need three to four substitutions to emerge as a pattern. This means that there is still some initial rhythmic connection to Clave 2's constant before their independence manifests. Once the patterns start to emerge, their shifted rhythmic position affects their relation to Clave 2's constant pattern.[164] There are two outcomes to this: either moving Clave 3's pattern means that Clave 2's pattern will be rearranged, or the listener will focus their attention solely on the build-up and be rhythmically abstract from all other parts.

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[164] Clave 1's position is inconsequential; it will always keep the constant rhythmic pulse.

Figure 3.7 Rearrangements of Clave 3's build-up in the 6/4 section.

a. Original position in the score
b. First onset becomes the new "one"
c. Triple consecutive onset is prioritized
d. Retrograde onset pattern

Consider Figure 3.7a, which shows Clave 3's build-up in the 6/4 section as originally notated in the score. As mentioned above, it has a t_6 relation to the signature pattern. Figure 3.7b takes the first onset and makes it the new downbeat. The context for this pattern is its starting point and a strict, linear rhythmic stream that follows. Starting the first attack as "one" is also a performative tactic that Hartenberger uses when playing patterns, especially in *Drumming*.[165] Although build-up (and removed) patterns in *Drumming* will always be a unison event, never against another transposed rhythm, performing in the rhythmic abstract allows the clave player in *Music for Pieces of Wood* to emulate the same tactic.

Figure 3.7c shifts the pattern so that it begins with the triple consecutive onset. By its notated appearance, it has a t_0 "unison" relation to Clave 2's constant. However, in practice, this rearrangement will still sound offset to Clave 2. The context is anticipatory: because Reich likes to create the triple consecutive onset in the final substitution, this rearrangement prioritizes the three consecutive onsets to be highlighted as the starting point. However, given that the expectancy is for the triple consecutive onset to be finished last, perhaps its placement is irrelevant so long as the listener strives to hear the consecutive onset.

The final rearrangement in 3.7d is what I believe to be the most organized pattern orthographically speaking.[166] The substitutions made from left to right result in the

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[165] Hartenberger 2016, 52.
[166] Like in Chapter 2's *Melodica* analysis, how I personally arrange the pattern based on my listening does not mean it is a definitive interpretation; it is a subjective one.

signature pattern going from 3+2+1+2 to its retrograded onset counterpart 2+1+2+3.[167] Further, the triple consecutive onset is complete at the end of the measure rather than the beginning. Although this rearrangement sets up its "one" later than Figure 3.7b's, the substitution spacings make for a tight-knit rhythm in m. 3. It continually adds onsets that, due to the new position of the pattern, favours the start of the pattern as the new "one" in m. 3 rather than waiting for the triple consecutive onset.

All of the rearrangements in Figure 3.7 account for a different starting onset, but what about pickups? In the same passage about performing a new "one" in the pattern, Hartenberger conceives rhythms with pickups only if he hears the patterns as being phrased with an accent.[168] Therefore pickups are only necessary if there are points of emphasis in the pattern. Accents and other emphases will not allow the listener to conceptualize the rearrangements that I have shown because it will create a rhythmic hierarchy. Again, the stylistic performance practice, which includes even attacks, allows for the listener to begin the pattern at any position.

3.4.4 The significant build-up pattern

In her discussion of J.S. Bach's Sonata in B Minor, Cumming explains that the first movement's appoggiaturas can be played such that "they may be felt as expulsions of breath—like a repeated sighing."[169] The interpretation of feeling the figures as sighs goes beyond the appoggiatura's non-harmonic function, which emphasizes dissonance on a strong beat that immediately resolves to a consonant tone. To gain the feeling of the

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[167] By "retrograded onset counterpart," I mean that it is implied that the 2+1+2+3 would start with an onset. If it were a true retrograde of the signature pattern, then it would begin with an eighth-note rest.
[168] Hartenberger 2016, 52.
[169] Cumming 2000, 135.

sighing somatic gesture, the performer must consider its representation and object; for

Cumming, the figuration is the former and the somatic event is the latter.[170] The

appoggiatura figuration is identifiable by its non-harmonic function, but its expression to

create an event of which a listener can feel the sighing gesture requires the performance

to be particular.

When realizing the pattern as gestural in *Music for Pieces of Wood*, the performer

must be clear when representing their respective pattern. The figuration is

straightforward: the consecutive addition of onsets in the build-up patterns continue until

they form the complete pattern. Cumming further explains that the gesture is an

"inflected *performance*, uniquely realized in a moment in time," and said inflected

performance "needs also to answer to the suggestions of notated shaping."[171] Because the

common performance practice in Reich's stylistic music is uninflected and continually

develops, can the patterns still be conceived as gestures? To answer this, consider the

listener who adopts attentive awareness. Whereas a listener is attentive to the sound

quality in process music, the listener is attentive to the articulate events in Reich's

stylistic works. Russel Hartenberger discusses an event involving the attentive listener

during a performance:

> Despite the ambiguity created by the sense of downbeat displacement with each
> new attack in the build-ups, the structure of *Music for Pieces of Wood* is
> straightforward and can be clearly heard by listeners. In fact, at a concert many
> years ago in the Netherlands, the audience broke into cheers and applause when
> [James] Preiss completed the final build-up in the third section of the piece.[172]

No matter where the notated downbeat resides, listeners can identify complete patterns.

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[170] Ibid.
[171] Ibid., 138, emphasis in original.
[172] Hartenberger 2016, 173.

Further, *Music for Pieces of Wood* is an apt example of how listeners can identify the formal structure. The three sections follow the same compositional process of build-ups against a pattern, and such a process can be identified by listeners.

Does this mean that the attentive listener once again infers gesture? A case can be made for both the affirmative and the negative. The listener's gestural inference in Reich's stylistic works depends on the performer somatically communicating the formal articulation. Their particular realization, informed by Reich's style, is what gives shape to the music. Because Reich's stylistic performance practice invites ambiguity, the inflected performance of a gesture is achieved through even attacks. An "even inflection" allows the listener to make their own perceptual inflections. This might seem like a continuation of the process music era, where the performer is in service to the process, and some of that is still applicable. However, the evenness is performatively deliberate in the stylistic works.

Thus, in *Music for Pieces of Wood*, the perceived pattern that is closest to Reich's stylistic intention will be considered the most significant of all the patterns. However, the three rearrangements in Figure 3.7b–d are subjective possibilities. There can be one perspective that is the closest to matching the style, but *perceiving* the perspective can vary. Lidov elaborates:

> The difference between sensory perceptions of things and perceiving perspectives is this: With material objects the individual 'sense data' that sum are unconscious. With the perception of a perspective we form an overall impression of details that we also may consciously experience individually. All notions of style or overall character are of this sort—*Weltanschauen*, *Zeitgeisten*, those qualities Barthes like to indicate with '-ness' ('Frenchness,' etc.).[173]

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[173] Lidov 1999, 111.

One thing to consider is how many onsets it takes until the build-up becomes a pattern. Conceptualizing the rhythmic arrangement begins by considering the onset placement in relation to the constant and ends with the formation of the pattern.

A listener's conscious experience will allow them to shift their attention to match how they perceive the rhythmic arrangement. At some point in the build-up, a listener's attention moves away from the anticipation of the next substitution in relation to its initial starting position of the build-up. Instead, it moves towards its relation from their own established starting position, where they believe to be the beginning of the pattern. This is due to the fact that the listener is informed not by treating the first note in the build-up as "one," but a new "one" that is informed by the build-up itself. As an example, perhaps the focus shifts away from the triple consecutive onset as the starting point, which is how the 3+2+1+2 signature pattern begins, and towards the 2+1+2+3. The effect of the constant pattern informing the build-up pattern and vice versa is shown in Figure 3.8.

Figure 3.8 The constant pattern and build-up pattern.

Constant informs build-up   Build-up informs constant
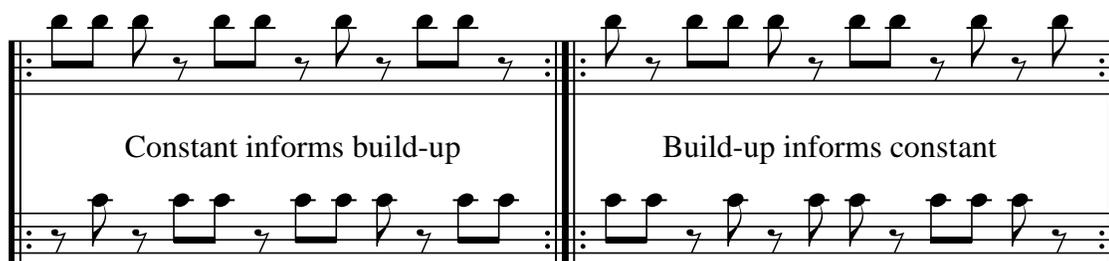
When the listener can manipulate the pattern such that the build-up informs the constant, they create a significant interpretation. They have effectively altered the given figuration and created their own subjective somatic event. In short, the pattern becomes a gesture. Subsequently, the listener can go through the same modes of interpretation in the 4/4 and 3/4 sections. As I have explained, their interpretations are informed by a new

constant, different build-ups, and a textural repetition that allows the performer and listener to determine when the vertical rhythm becomes a linear pattern. As Claves 4 and 5 initiate their build-up, the constant informing the build-up becomes more complex due to the thicker texture. Thus, it is increasingly probable that the listener is more likely to focus on the build-up, and subsequently the textural repetition from the composite pattern becomes more indexical. The result is more engagement to the build-up as the piece increases its texture.

3.4.5 Closing

Music for Pieces of Wood is an example of how a combination of simple compositional features can create a complex and nuanced work. All of the material derives from Reich's signature pattern. The pattern development through the build-up technique is a stylistic trait that can be seen in other works of Reich including *Drumming*, *Music for 18 Musicians*, and his postminimalist works. Combining the pattern with an articulate, three-part formal design as well as the composite patterns layered along the way results in a work that is both formally salient and texturally dense. By its performance and perception, the pattern can emerge as a gesture in areas where the listener deems it significant.

3.5 *Drumming*

Along with *Violin Phase* and *Phase Patterns*, as discussed above, *Drumming* can be best described as a "stylistic hybrid," having one foot in the past and another in what was to come. The difference between Reich's process works and the works in the 1970s is the source material. Reich cites his studies of West African music, through the writings of A.M. Jones and his trip to Ghana, as being a confirmation of the structural concepts

that he had considered when composing process music. This led to longer patterns,
including the 3+1+3+1 pattern in *Drumming* and signature pattern discussed in the *Music
for Pieces of Wood* analysis, a larger ensemble, use of acoustic instruments, and of course
an emphasis on rhythm over melody.

Considering the compositional techniques and goals, *Drumming* is the final work
to make use of phase, where one part incrementally shifts to create composite patterns
from rhythmically transposed variants of a constant. Along with *Violin Phase* and *Phase
Patterns*, *Drumming* also uses resulting patterns, defined as patterns which emphasize the
composite pattern through a mix of the composer's instruction and the performer's
discretion. Due to the gestural signification behind a pattern reliant upon choice, this
analysis will focus on how resulting patterns are gesturally employed through two
perspectives. Following an overview of the patterns in *Drumming*, I will demonstrate
how the notation from the original Multiples score versus the modern Boosey & Hawkes
score can affect how the performer realizes resulting patterns.[174] I will then discuss the
gestural interpretation of the resulting patterns from the performer's and listener's
perspectives.

3.5.1 Patterns in *Drumming*

Drumming uses a combination of build-up, removal, composite patterns, and
resulting patterns. Rather than formal divisions determining the movements, called Parts
in this work, Reich organizes the work based on the combination of instruments. Part I
uses bongos, Part II uses marimbas with resulting patterns sung by soprano and alto

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[174] Steve Reich, *Drumming* [Multiples version] (New York: Reich Music Publications, 1971); Steve Reich, *Drumming*, rev. ed (New York: Hendon Music, Inc., 2011).

voices, Part III uses glockenspiels with resulting patterns played by whistle and piccolo, and Part IV uses bongos, marimbas, and glockenspiel with resulting patterns by soprano, alto, and piccolo. Reich's organization of the first three parts shows that he wanted to go higher in register and end with a culmination of every instrument in the fourth part.

The work relies on a single 3+1+3+1 pattern. In the Boosey & Hawkes notes, Reich describes the essential basic pattern that is utilized throughout the work:

> *Drumming* begins with two drummers building up the basic rhythmic pattern of the entire piece from a single drum beat, played in a cycle of twelve beats with rests on all the other beats. Gradually additional drumbeats are substituted for rests, one at a time, until the pattern is completely built up...
> ...There is, then only one basic rhythmic pattern for all of *Drumming*:

> This pattern undergoes changes of pitch, phase position and timbre, but all the performers play this pattern, or some part of it, throughout the entire piece.[175]

Figure 3.9 shows Drummer 1's build-up to the unison pattern in *Drumming*.[176] The final result in m. 15 matches the exact contour that Reich explains in his notes.

Figure 3.9 Steve Reich, *Drumming*, beginning build-up.
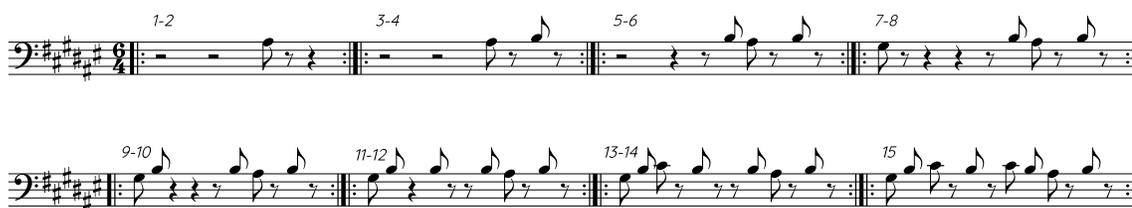
This beginning build-up has many of the same attributes that were shown in the *Music for Pieces of Wood* build-ups. The beginning onset is not the notated downbeat,

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[175] Reich 2011, iv.

[176] The excerpt spans mm. 1–15 in the Boosey & Hawkes score, but omits every other measure. This spans mm. 1–9 in the Multiples score. The Multiples score does not designate a time signature.

and thus the performer has to consider whether to consider this onset as their own "one" or use the score's notation. Second, the transformation from rhythm to pattern happens somewhere in the third or fourth build-up measure. *Drumming*'s build-up patterns have the added benefit of being played on pitched percussion, which allows for further insight into its contour. The G♯ anchors the preceding neighboring figure, and the listener will eventually discover that it is the lowest note in the complete pattern. Finally, Reich waits until the last moment of the build-up to complete the groupings with the most consecutive onsets. As we can see, the C♯s in the final two build-up measures complete the pair of triple consecutive onsets.

The first pattern is the basis of eighteen different patterns used throughout *Drumming*. This is expressed in Example 3.3 as Q1.[177] A single pattern Q played by one or more players is a unison pattern and is expressed in Figure 3.9 by $t_{0,0(,0,0)}(Q)$ with the number of zeroes corresponding to the number of parts. There are six different areas in *Drumming* that arrive at unison either by a build-up or by phase: mm. 18 (R9), 127 (R15), and 155 (R29) in Part I; m. 223 (R49) in Part II; and m. 412 (R70) and 505 (R92) in Part III.[178] The function of the unison is to establish or reestablish a sort of "baseline," or neutral starting point. This is found in mm. 18, 223, and 412. In the latter two measures, the instruments introduced in Parts II and III respectively enter in unison, allowing the instruments from the previous Parts to come to rest. From Part I to II, the

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[177] This labeling system is initially derived from Richard Cohn's analyses of Reich's phase music where Q is a measured set (Richard Cohn, "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Perspectives of New Music* 30/2 (1992), 146–177). See also John Roeder, "Beat-Class Modulation in Steve Reich's Music," *Music Theory Spectrum* 25/2 (2003), 275–304, and Duker 2013 for Reich analyses that use Q for a measured set.

[178] Measures in the Multiples score are expressed with R (see Duker 2013, 145).

bongos send Q4 over to the marimbas. From Part II to III, the marimbas send Q10 over to the glockenspiels. As discussed, the beginning Q1 is preceded by a build-up. These three reference points act as the constant indicators of moving from one section to the next and allow performers and listeners to familiarize themselves with the textures. Every pattern Q expresses the individual pitch changes that Reich mentions along with the timbre being implied by its location in the work. The "phase position," which I believe to mean phase transposition, is expressed as $t_x(Q)$, with x being transposition by the eighth note. In *Drumming*, Reich moves the patterns one quarter note at a time, which is expressed as t_{10}, t_8, t_6, etc. Example 3.3 shows the aggregate to the phase overlaps, all derived by Q1 and transposed a quarter note away, as one composite pattern. The orientation of a single pattern, a combination of different patterns, or a pattern's respective transpositions determines the type of movement or activity that Reich creates.

When a new performer enters, specifically Drummers 3 and 4 with respect to Example 3.3, they do not directly begin phasing. Instead, they play resulting patterns. According to Reich, resulting patterns are "melodic patterns resulting from the combination of two or more identical instruments playing the same repeating pattern one or more beats out of phase."[179] There are two points to consider in this definition. First, melodic patterns result from composite patterns.[180]

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[179] Reich 2002, 26. Resulting patterns has also been referred to as "resultant" patterns. Its interchangeability is seen in Reich's own writings (Reich 2002; Reich 1971) and in minimalist music scholarship (Duker 2013, Hartenberger 2016). I am choosing to use resulting based on Reich's description of "resulting in" instead of the alternative "resultant of." Although differing in syntax, resulting/resultant patterns are semantically equivalent.

[180] The composite pattern is also synonymous with what Reich calls "phase relationships" in the Multiples score, with the "phased pattern" of t_n and its relation to the "constant pattern" of t_0.

Example 3.3 Steve Reich, *Drumming*, m. 125 (R14).

Second, resulting patterns are performed in combination with the composite pattern.

Once the composite pattern is established by two or more performers in *Drumming*, for

example, additional players enter to play resulting patterns. The overall progression is

shown in Figure 3.10. This progression is present in six different areas in *Drumming*.

Some do not use the build-up, some have multiple instances of phase to composite +

resulting patterns (hence the repeat), and others begin from a composite pattern rather

than a unison pattern.[181]

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[181] Areas include R1–13, R50–55, R60–63, R77–80, R86–87, and R121–122.

Figure 3.10 *Drumming*'s pattern progression.

$$\text{note(s)} \xrightarrow{\text{build-up}} \text{unison pattern} \Bigg\|\,\bullet\,\xrightarrow{\text{phase}}\, \begin{array}{c} \text{composite pattern} \\ + \\ \text{resulting pattern(s)} \end{array}\,\bullet\,\Bigg\|$$
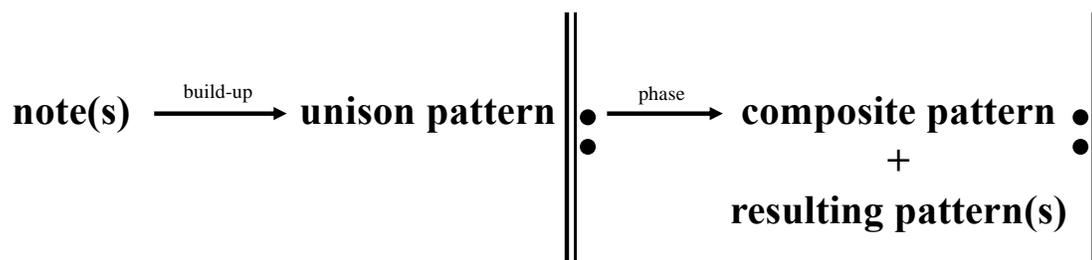
Resulting patterns are significant because they indicate a performer's choice in the pattern. The multiple layering of both composite patterns and resulting patterns can create dense textures, polyrhythms, cross-patterns, and so on—all of which are found in Reich's previous works. When interpreting the patterns, a phenomenon emerges in which the listener can remember the performer's resulting patterns as the piece continues to progress. Whereas Reich's previous process works had the listener attend to its continuous progression, *Drumming* takes its time to highlight what has been created. In other words, Reich managed to *articulate* the composite pattern by a) lingering on it rather than systematically progressing, and b) adding a resulting pattern that was formally derivative yet functionally independent from it.

3.5.2 Scores as representamen and their performance

As discussed in the previous analysis, Cumming explains that the score, our semiotic representamen, is expressed through configuration. Its figuration affects how the performers will interpret and perform the music. *Drumming* has two notable scores: the 1971 Multiples score and the 2011 Boosey & Hawkes score. Qualifying these representamen will show how unique these scores are and thus will affect the performance.

The original *Drumming* performers learned the work by rote.[182] Following the first performance, the Multiples score was created for other ensembles who did not have the luxury of Reich playing with them. Like his process works, *Drumming*'s Multiples score includes handwritten instructions by Reich. The score's determinacy, including choice in resulting patterns, is more on the onus of the performer than it is on the composer. Consequently, per Reich, ambiguous interpretations resulted in "an increasing number of unfortunate performances" and thus led him to create the Boosey & Hawkes score.[183]

The Multiples score is more instructional, and the Boosey & Hawkes score is more traditionally notated. For every single change in the work's activity (e.g., when a new part enters), there is a new barline added in the Boosey & Hawkes score. Subsequently, the score is extensive and logs every minute detail. The Multiples score, on the other hand, includes Reich's own instructions in how every "section" or "moment" is performed. These sections are numbered accordingly, analogous to rehearsal measures, but should be considered more as the point in which Reich has notes/instructions for the numbered sections than as barlines. This potentially allows for a less rigid performance.

One of the biggest differences between these two scores is that the Multiples score has no indication of meter. I believe this is because the goal of this work is not to obscure meters but to obscure downbeats. Scholars have analyzed Reich's works with multiple meters,[184] yet putting his music within the constraints of a meter adds a layer

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[182] Hartenberger 2016, 60.

[183] Reich 2011, vii.

[184] Most notably, see Gretchen Horlacher, "Multiple Meters and Metrical Processes in the Music of Steve Reich," *Intégral* 14/15 (2000), 265–269.

that was not there before. Again, his music will contain rhythmic ambiguity by design,

but there is something artificial and perhaps unnecessary to introducing metric ambiguity.

In other words, especially for *Drumming*, that is on the analyst, not exactly Reich

himself. Figures 3.11–3.14 show the entire organization of *Drumming*—consisting of the

patterns and their transpositions, resulting pattern sections, build-up and removal

sections—according to their respective places in the Multiples score and Boosey &

Hawkes score.[185]

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[185] The tables and patterns in Figure 3.11–3.14 are in large part derived from Examples
2a–f of Duker's analysis (Duker 2013, 146–150). However, my tables show every
measure of the Multiples score and its corresponding location in the Boosey & Hawkes
score. I want to thank Philip Duker for allowing me to adapt his examples from his 2013
Perspectives article accordingly.

Figure 3.11 Structural organization of *Drumming*, Part I.

Multiples	*Drumming*	Boosey & Hawkes
1–8	build-up	1–16
9	$t_{0,0}$(Q1)	18
10	$t_{0,10}$(Q1) resulting patterns	20 21–70
11	$t_{0,8}$(Q1) resulting patterns	72 73–99
12	$t_{0,8,0}$(Q1)	100
13	$t_{0,8,10}$(Q1) resulting patterns	103 104–123
14	$t_{0,6,8,10}$(Q1)	125
15	$t_{0,0,0,0}$(Q1)	127
16–22	removal	129–140
23–28	build-up	141–153
29	$t_{0,0}$(Q2)	155
30	$t_{0,10}$(Q2)	157
31	$t_{0,8}$(Q2)	159
32	$t_{0,8,8}$(Q2)	160
33	$t_{0,6,8}$(Q2)	163
34	$t_{0,4,8}$(Q2)	165

35–38	$t_{0,4,8}(Q2)$	169–188
38	$t_0(Q2) \cup t_4(Q2) \cup t_8(Q2)$	189
39	$t_0(Q3) \cup t_4(Q2) \cup t_8(Q2)$	190
40	$t_0(Q3) \cup t_4(Q2) \cup t_8(Q3)$	191
41	$t_0(Q3) \cup t_4(Q3) \cup t_8(Q3)$	192
42	$t_0(Q4) \cup t_4(Q4) \cup t_8(Q4)$	193
43–46	$t_{0,4,8}(Q4)$	194–217
47	$t_{0,4,8}(Q4)$	218–220

Figure 3.12 Structural organization of *Drumming*, Part II.

Multiples	*Drumming*, Part II	Boosey & Hawkes
48	$t_{0,4,8}(Q4)$	221
49	$t_{0,0,0}(Q4)$	223
50	Q4	225
51	Q4 ∪ Q5	226
52	Q4 ∪ Q5 ∪ Q6	227
53	Q4 ∪ Q5 ∪ $t_{10}(Q6)$ resulting patterns	229 230–241
54	Q4 ∪ Q5 ∪ $t_{10,10}(Q6)$	242
55	Q4 ∪ Q5 ∪ $t_{8,10}(Q6)$ resulting patterns	245 246–261
56	Q4 ∪ Q5 ∪ Q6	264
57	Q4 ∪ Q5	266
58	Q4 ∪ Q5 ∪ Q7 ∪ Q8	267
59	Q4 ∪ Q5 ∪ Q7 ∪ Q8 ∪ Q9	268
60	Q4 ∪ Q5 ∪ Q7 ∪ Q8 ∪ $t_{10}(Q9)$ resulting patterns	271 272–320
61	Q4 ∪ Q5 ∪ Q7 ∪ Q8 ∪ $t_{10,10}(Q9)$	322
62	Q4 ∪ Q5 ∪ Q7 ∪ Q8 ∪ $t_{8,10}(Q9)$ ∪ $t_{8,10}(Q10)$ resulting patterns	325 326–370
63	Q4 ∪ Q5 ∪ Q7 ∪ Q8 ∪ $t_{8,10}(Q9)$ ∪ $t_{0,8,10}(Q10)$ resulting patterns	372 373–398
64	Q5 ∪ Q7 ∪ Q8 ∪ $t_{8,10}(Q9)$ ∪ $t_{0,8,10}(Q10)$	401

65	$Q7 \cup Q8 \cup t_{8,10}(Q9) \cup t_{0,8,10}(Q10)$	403
66	$Q7 \cup Q8 \cup t_{0,8,10}(Q10)$ $t_{8,10}(Q9) \cup t_{0,8,10}(Q10)$	405
67	$t_{0,8,10}(Q10)$	407

Figure 3.13 Structural organization of *Drumming*, Part III.

Multiples	*Drumming*, Part III	Boosey & Hawkes
68	$t_{0,8,10}$(Q10)x2	409
69	$t_{0,8,10}$(Q10)	410
70	$t_{0,0,0}$(Q10)	412
71	Q10	414
72	Q10 ∪ Q11 ∪ Q12	415
73	Q11 ∪ Q12	416
74	$t_{0,0}$(Q11) ∪ Q12	417
75	$t_{0,10}$(Q11) ∪ Q12	420
76	$t_{0,10,10}$(Q11) ∪ Q12	421
77	t_0(Q11) ∪ t_8(Q11) ∪ t_{10}(Q11) ∪ Q12	424
78	t_0(Q11) ∪ t_8(Q13) ∪ t_{10}(Q11) ∪ Q12 resulting patterns	425 426–444
79	t_0(Q13) ∪ t_8(Q13) ∪ t_{10}(Q11) ∪ Q12	445
80	t_0(Q13) ∪ t_8(Q13) ∪ t_{10}(Q13) ∪ Q12 resulting patterns	446 447–462
81	t_0(Q13) ∪ t_0(Q13) ∪ t_0(Q13) ∪ Q12	465
82	Q13 ∪ Q12	467
83	Q13 ∪ t_0(Q14)	468
84	Q13 ∪ $t_{0,0}$(Q14)	469

85	Q13 ∪ t$_{0,10}$(Q14)	472
86	Q13 ∪ Q$_{0,10,10}$(Q14)	473
87	Q13 ∪ Q$_{0,8,10}$(Q14) resulting patterns	476 477–494
	Q13 ∪ t$_{0,8,10}$(Q14) Q13 ∪ t$_0$(Q14) ∪ t$_{8,10}$(Q14)	495
88	Q13 t$_0$(Q14) t$_{8,10}$(Q15)	497
89	t$_0$(Q14) ∪ t$_{8,10}$(Q15)	499
90	t$_0$(Q14) ∪ t$_{0,8,10}$(Q15)	500
91	t$_{0,8,10}$(Q15)	503
92	t$_{0,0,0}$(Q15)	505
93–101	t$_{0,0}$ —> removal	507–524

Figure 3.14 Structural organization of *Drumming*, Part IV.

Multiples	*Drumming*, Part IV	Boosey & Hawkes
102–109	build-up	525–562
109	$t_{0,0}(Q16g) \cup t_{0,0}(Q17m) \cup t_{0,0}(Q18b)$	562
110	$t_{0,0}(Q16g) \cup t_{0,10}(Q17m) \cup t_{0,0}(Q18b)$	564
111	$t_{0,0}(Q16g) \cup t_{0,10}(Q17m) \cup t_{0,10}(Q18b)$	566
112	$t_{0,10}(Q16g) \cup t_{0,10}(Q17m) \cup t_{0,10}(Q18b)$	568
113	$t_{0,10}(Q16g) \cup t_{0,8}(Q17m) \cup t_{0,10}(Q18b)$	570
114	$t_{0,10}(Q16g) \cup t_{0,8}(Q17m) \cup t_{0,8}(Q18b)$	572
115	$t_{0,8}(Q16g) \cup t_{0,8}(Q17m) \cup t_{0,8}(Q18b)$	574
116	$t_{0,8,8}(Q16g) \cup t_{0,8,8}(Q17m) \cup t_{0,8,8}(Q18b)$	575
117	$t_{0,8,8}(Q16g) \cup t_{0,6,8}(Q17m) \cup t_{0,8,8}(Q18b)$	578
118	$t_{0,8,8}(Q16g) \cup t_{0,6,8}(Q17m) \cup t_{0,6,8}(Q18b)$	580
119	$t_{0,6,8}(Q16g) \cup t_{0,6,8}(Q17m) \cup t_{0,6,8}(Q18b)$	582
120	$t_{0,6,8}(Q16g) \cup t_{0,4,8}(Q17m) \cup t_{0,6,8}(Q18b)$	584
121	$t_{0,6,8}(Q16g) \cup t_{0,4,8}(Q17m) \cup t_{0,4,8}(Q18b)$	586
122	$t_{0,4,8}(Q16g) \cup t_{0,4,8}(Q17m) \cup t_{0,4,8}(Q18b)$ resulting patterns	588 589–607
	end	608–610

There are two notable differences between the Multiples and Boosey & Hawkes scores

that I want to discuss. First, the notation of build-up and removal in the Multiples score

displays each measure in an up-down orthography rather than the traditional left-right.

Example 3.4 shows the opening build-up as notated in the Multiples score.[186] As shown

in Figure 3.9 above, this same passage spans mm. 1–15 in the Boosey & Hawkes score.

The Boosey & Hawkes score indicates all of Reich's instructions and realizes it in the

more conventional appearance. The second difference is the appearance of the resulting

patterns sections. Example 3.5 shows the first resulting pattern section in the Multiples

score and Example 3.6 shows its equivalent location in the Boosey and Hawkes score.[187]

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[186] Reich 1971, 2.
[187] Ibid., 3. Reich 2011, 2–6.

Example 3.4 Steve Reich, *Drumming,* Multiples score, R1–8.

Example 3.5 Steve Reich, *Drumming*, Multiples score, R10.

This one quarter note out of phase relationship is maintained by drummers one and two while drummers three and four sing and/or play patterns they hear clearly emerging from the combination of the first two drummers. Two of these resulting patterns are written out above at Ⓐ and Ⓑ, but others can be added or substituted in the blank bars Though Ⓐ and Ⓑ are both four bars long, patterns of other lengths can obviously be heard. When singing these patterns a microphone is necessary in order to be heard. The voice should be used to imitate the exact sound of the drum patterns which may involve using syllables like "tak", "duk", and so forth. The voice(s) should enter softly and gradually increase in volume so that these patterns gradually rise to the surface of the music and then just as gradually subside by lowering the volume of the voice. A similar approach should be used when playing these patterns.

After all the resulting patterns have been sung and/or played, drummer two once again slightly increases his tempo so that he slowly moves another quarter note ahead of drummer one as shown at bar ⑪. Once again resulting patterns are performed and when completed drummer three enters in unison with drummer one as shown at ⑫. After several seconds in unison he slightly increases his tempo so that in 20 or 30 seconds his is one quarter note ahead of drummer one and therefore one quarter note behind drummer two as shown at measure ⑬.

Example 3.6 Steve Reich, *Drumming*, Boosey & Hawkes score, mm. 21–70.

"Drumming" by Steve Reich
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Examples 3.5 and 3.6 show the same material expressed in vastly different ways, and

thus their representations will greatly affect the way in which the material is realized. The

score as representamen can be further qualified as sinsigns and legisigns, two signs from

Peirce's first trichotomy that I discussed in Chapter 1. Sinsigns, or singular signs, are

particular and are more susceptible to subjective potentiality. Legisigns rely upon

convention and are more articulate. In distinguishing between the two, Cumming looks to

Lidov for further elaboration:

By pointing out the distinction between a particular performance and its notated form, Lidov shows a sensitivity to the discriminations captured in Peirce's first trichotomy, where singular (sinsigns) and conventional (legisigns) appear. Sinsigns and legisigns mark two points on a scale of events with varying degrees of conventionality. The "singular" depends on a particular enactment, while the purely "conventional" can be identified readily as a repeated pattern with an assigned connotative range. A performed inflection is a singular event, and an appoggiatura is a conventional ornament, with gestural potentiality, but between them come many degrees of stylistic determination.[188]

The Multiples score's resulting patterns are represented by choices. Performers choose their resulting pattern according to what they believe to be emerging from the composite patterns. The score further grants choice to the performer by either playing the suggested patterns or playing something different entirely. The Boosey & Hawkes score's resulting patterns are represented by its given notation. What Cumming describes as a "repeated event" can be applied to this score through the repeated use of resulting patterns given to the performer rather than ones chosen. Both scores, however, have their drawbacks. The potential drawback of the Multiples score includes the risk of patterns Reich did not intend to be expressed. The potential drawback of the Boosey & Hawkes score is a more rigid performance, or several performances with the same interpretation.

Turning to Cumming's final thought, does the score affect *Drumming*'s stylistic connotation? Both scores treat the figuration differently, but one similarity keeps them grounded in Reich's minimalist style. In both scores, the potential resulting patterns coincide with their location in the composite pattern. Resulting patterns are designed to be layered on top of the composite pattern, not to be played *ad lib* (i.e., not on a random beat). For example, both scores make use of the descending A♯–A♯–G♯–G♯ scalar pattern beginning on beat four of the resulting pattern's measure. This passage allows the

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[188] Cumming 2000, 142.

listener to fixate on features including its contour (i.e., the lower notes of the main composite pattern) and potentially their metric location (i.e., leading into a measure). Thus, as obvious as it may seem, it is crucial for the performer to keep their resulting patterns consistent with how the scores represent them. Reich's minimalist style comes through when the patterns are played correctly.[189]

3.5.3 Performing resulting patterns

Resulting patterns point out underlying rhythms present within composite patterns, emerging as particular. Because they are particular by design, resulting patterns are indicative of the composite patterns, which are themselves indicative of the changes in *Drumming*'s progression. Thus, the performer's choice of their resulting pattern from a composite pattern is indexical, and subsequently resulting patterns are indexical gestures. According to Peirce, "Anything which focuses the attention is an index."[190] The index is the most apparent sign to a subject because it draws the attention towards the object to which it represents, or, in an atemporal context, it is indicative of the object to which it represents. A common example that highlights its namesake is one's index finger, used to point towards something. It can represent the direction or position of an object.

In his analysis of *Drumming*, Philip Duker has rebuked the function of resulting patterns as being disruptive to the overall teleology by creating "lengthy points of stasis in each region."[191] The use of phase and phase relationships are indeed integral to the outcome of the work and its overall structure. However, if the goal of *Drumming* is to

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[189] Hartenberger also discusses accenting certain notes while playing the composite pattern and thus creating his own resulting pattern (Hartenberger 2016, 54).
[190] Charles Sanders Peirce, *The Philosophy of Peirce: Selected Writings*, edited by Justus Buchler (London: Kegan Paul, 1940), 108.
[191] Duker 2013, 166.

focus on the teleology of each phase relationship, progressing from one composite pattern to another through a predetermined construction and outcome, then this would be a process work. Resulting patterns not only provide the opportunity of variety within the sections of phase relationships, but they also affect how the work itself develops.

Lastly, the degree of signification depends on the type of realization. The choice between the two available scores will affect how a performer chooses their resulting patterns and thus affect the signification. Examples 3.5 and 3.6 show the first area where resulting patterns are employed. The Boosey & Hawkes score is already realized because Reich wanted more structure to the performance; it is more of a passage than it is a pattern. However, the passage is derived from a series of resulting patterns that Reich himself composed in the Multiples score, specifically pattern A. Although the same type of signification will be present, where the resulting pattern highlighted is indicative of the composite pattern, the downside is the potential lack of variety in different performances. On the other hand, the Multiples score not only shows given resulting patterns, but blank measures for others to make their own resulting patterns. Choosing the resulting pattern itself rather than realizing it as a passage does add an extra element of signification. However, as Reich pointed out, there is the possibility that too much freedom can negatively affect the work's progression.

In any case, the communication of the resulting patterns is of the utmost importance. First, composite patterns should be clear, consistent, and unaccented. Just as in *Music for Pieces of Wood*, the composite pattern can create textural repetition. However, textural repetition operates differently in *Drumming*. There is no build-up pattern for the composite pattern's repetition to index. Instead, it is the resulting patterns

that index the composite pattern. This allows for the ideal setting of the resulting patterns to be played. Second, with the proper execution of resulting patterns, the attentive listener will then be in the best position to determine what patterns are being highlighted.

3.5.4 Listening to resulting patterns

With resulting patterns being rhythmically indicative of their composite patterns, thus creating indexical gestures, the question arises: do said gestures emerge because the rhythms chosen by the performer were deemed significant, or do gestures emerge by the listener's inference? In considering the latter, a mode of attentive awareness is still imperative. Whereas the listener contributes to the process itself in the minimalist aesthetic, where form and content informed one another, the listener engages more with the form in the minimalist style. The slight difference hinges on the bifurcation of the form and content of the minimalist style. Thus, the attentive listener can follow the progression of the form given its now varied content that does not rely on a predetermined process.

Semiotically, the observer to which an index is presented is the one that infers its meaning. For example, at one level, smoke will signify the existence and location of a fire. On a different level, one will observe the smoke and infer its existence and location. Thus, it is a matter of the inherent signification and the inference of the signification. Both cases rely upon the direct relationship of a sign (representamen) to an object, which will subsequently create a reaction to the object.

When a subject is presented with a musical object that is indexical in quality, the gesture and its signification will be observed in its inference and subsequent reaction. Cumming elaborates:

> It is not so much the *appearance* of the gesture that is informative [. . .] as it is the variable attributes of apparent energy and control. It is because the varying qualities of motion do not depend on a visual presentation in order to be recognized that they can be musically presented and transformed in such an effective way. A listener's means of understanding them may include a tacit "feel" for the gesture, or even an energetic response, suppressed to different degrees depending on the style. The energy and directedness of an index is not lost, though they form part of a unit which, as a whole, becomes the aural icon of a possible affective state.[192]

In the case of *Drumming*, the gesture's attributes, and thus the presence of the index, is dependent upon recognizing the resulting patterns within the composite patterns. It is possible for the composite patterns to be relegated to the background due to their lack of accentuation. However, the presence of resulting patterns highlights the continuation of the composite patterns within the respective formal areas as well as when the work progresses. Thus, a listener's "feel" for the gestures in *Drumming* is largely dependent upon the complete texture of both composite and resulting patterns and their respective energetic shaping. Further, as Cumming suggests, the degree of response to this shaping is dependent upon the style.

3.5.5 Interpreting the patterns as gestures

Following his formal outline of *Drumming*, Duker's article primarily focuses on the ideal listening strategy and the effect that performative communication has on the listener. Duker says, "As opposed to a piece that presents a salient melodic/rhythmic pattern to follow, the structure of *Drumming* can be understood as encouraging listeners to actively highlight different notes from the combined texture, thereby producing their own melodies."[193] There is still a form of salience to *Drumming*, albeit a more increased,

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[192] Cumming 2000, 92, emphasis in original.
[193] Duker 2013, 171.

layered type of salience. Whereas process works continuously move from one composite

pattern to the next, for example, *Drumming* moves from areas of phase to areas of

resulting patterns. Nonetheless, what is important to highlight here is that the listener can

participate in works of the minimalist style by constructing melodies in the patterns.

There are two types of melodies that Duker cites as a product from listening. The

first is a listener using resulting patterns to discover hidden melodies within a composite

pattern.[194] The idea of melodies, or any compositional component, hiding within a

minimalist work is counterintuitive to its own design. There are no secrets when it comes

to minimalist music, and the composer's intention is not to conceal. Rather, thinking

gesturally, the listener can use resulting patterns to construct what they believe to be an

underlying melody.[195] The signification of this action makes the content gestural. Further,

the signification can change with each listening, each performance, and so on.

The second melody type Duker discusses is trace melodies, which are formed

when resulting patterns are played and linger in the listener's mind while other patterns

are performed later in the work.[196] The texture, which progresses through new composite

and resulting patterns, where this lingering is possible, is described by Duker as a musical

palimpsest, a term attributed to parchment or a manuscript with evidence of previous

writing erased to create room for new writing. Duker explains that in *Drumming*,

"continual repetition (and with it, the constant confirmation of expectation) [encourages]

a listener to turn their attention more towards the immediate present (and perhaps the

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[194] Ibid., 170.
[195] However, in Duker's defense, the melodies made are examples of Reich's "psychoacoustic by-products," and, in Reich's stylistic works, these by-products are made intentional in the form of resulting patterns. See Reich 2002, 26.
[196] Duker 2013, 168.

immediate past), as opposed to focusing on the immediate future."[197] This musical palimpsest situates the listener an immediate past and present, with the former informing the latter, and emerging from this palimpsest is the trace melody.

For trace melodies to work, the performer chooses which patterns, resulting from the composite pattern, are significant enough to perform. After they are performed and communicated to the listener, the pattern itself can linger after the performer finishes their resulting pattern. Therefore, trace melodies potentially influence how the listener hears the music going forward. The inference of the resulting pattern by the listener, initially communicated by the performer, shows a type of transference in signification.

A trace melody operates through the culmination of previous material to determine how future melodies are heard. It would not be unreasonable, then, to think of a melody that operates through the anticipation of what is to come without previous material determining its structure.[198] Suppose a listener is familiar with *Drumming*'s structure. They would know, for example, when the resulting patterns arrive in the work and what parts, players, or instruments will be playing the resulting patterns. Their conception of melodies made by composite patterns, resulting patterns, or both, will differ compared to a casual or first-time listener. The type of inference from this listening shows a high level of maturity and understanding of the music. Thus, a listener who is familiar with the material will be better suited to interpreting gestures and have more control in how they want to aurally shape the work.

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[197] Ibid., 169.

[198] This is interesting because much of the theoretical scholarship on minimalist music talk about their listening strategies to the reader as if it is their first time hearing a minimalist work.

3.5.6 Closing

Cumming asserts that the requirements of indexicality "do not look very promising for the exploration of non-texted instrumental music, which does not 'point at' anything in particular, unless the music is composed as a fanfare, overture, or prelude to a following event, and played in the appropriate context."[199] In contrast, *Drumming* exemplifies the perfect context in which a non-texted instrumental work can create musical indices (resulting patterns) that point at objects within the work. This work exemplifies the beginning of Reich's minimalist style. The composer used longer patterns, with different functions, the ensemble was larger, and it was his first work to use voice and wind instruments. *Drumming* is a work undoubtedly influenced by Reich's exposure to West African drumming, and yet it is unmistakably a Western composition.

3.6 Conclusion

Gesture in the minimalist style is most identifiable by its articulate presentation. Listeners are now able to distinguish larger sections, and within said sections lies the pattern. As I have shown, the pattern is the focal point of Reich's stylistic works. Though I only cover two works from the early 1970s, the same is applicable to later works including *Music for Mallet Instruments, Voices, and Organ* (1973), *Six Pianos* (1973), and *Music for 18*.[200] The pattern allowed Reich to develop intricate textures by means of the build-up technique and resulting patterns. Further, for the listener, Reich's stylistic works concentrated on directing the listener's attention towards a particular musical

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[199] Cumming 2000, 90.

[200] *Music for Mallet Instruments, Voices, and Organ* makes use of an augmentation process, but again this process does not determine a form-content fusion like it does in *Pendulum Music* and *Four Organs*.

segment. How the performer played patterns and how the listener identified and inferred them determined the signification and thus the gestural activity. The next chapter will explore Reich's postminimalist works, and just as his compositional techniques become codified, so too do the gestures and the analytical frameworks that theorists have employed.

Chapter 4

The Minimalist Technique: Signifying Analyses of Reich's Postminimalist Works

Reich's works in the 1970s sought to forego experimentation in favour of stylistic attributes. Moving into the 1980s, Reich's most commonly used stylistic attributes could be found in more than one work. Subsequently, these common threads moved from singular instances of them (pattern development, pulse, etc.) to conventional use. The types of work to come out of the conventional uses, roughly spanning from Reich's *Tehillim* (1981) to *Different Trains* (1988), are considered to be his postminimalist music.

Because of the compositional conventions Reich applies in his postminimalist music, the means of finding signification in the works will operate at a level that deems musical gesture less significant than Reich's previous works. Whereas the listener and the performer were the musical subjects of interest in Chapters 2 and 3 respectively, the analyst is the subject of Chapter 4. Thus, the focus of this chapter is on previous analytical representations of Reich's postminimalist works, and the goal is to reinterpret formalist analyses on a meta-theoretical level and add a referential perspective.

4.1 Postminimalist Music

The emergence of postminimalism was a combination of developed practices and novel ones. The latter concerned new composers entering the fore, including John Adams, Tom Johnson, Henryk Górecki, and Arvo Pärt. The former saw composers, notably Reich and Philip Glass, expand their compositional practice. In his final qualifier of the minimalist music triumvirate, Timothy Johnson describes postminimalist music as producing a "technique." The minimalist technique expands the five traits of the minimalist style, including "a continuous formal structure, an even rhythmic texture and

bright tone, a simple harmonic palette, a lack of extended melodic lines, and repetitive

rhythmic patterns."[201] The defining characteristic of this technique, though, is that

multiple compositions shared similar traits.

4.1.1 The minimalist technique

In his article on the differences between minimalist and postminimalist music,

Jonathan Bernard seeks to find the transition, or "metamorphosis," between these two

periods by positing three inquiries concerning the compositions themselves and the social

implications.[202] First, has minimalist music continued in this time of transition (i.e., from

the late 1970s into the early 1980s)? Second, has it turned into something else, a

postminimalist music, and if so, how does one recognize it? And finally, is this

postminimalist music not only a product of the preceding minimalist practices, but also

one that marked a trend "[emerging] in new American concert music" in the late

twentieth and early twenty-first centuries that focused their attention toward an

"ostensibly tonal" idiom?[203]

> Bernard's answer to the second question cites Johnson's three descriptors, stating:
>
> It would appear that postminimalism can only signify matters of technique,
> effectively as vestiges of minimalism, since the composers in question are so
> diverse in aesthetic and stylistic orientation; all have seized upon elements of
> minimalism but have gone in very different directions with them.[204]

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[201] Timothy Johnson, "Minimalism: Aesthetic, Style, or Technique?" *The Musical Quarterly* 78/4 (1994), 751.

[202] Jonathan Bernard, "Minimalism, Postminimalism, and the Resurgence of Tonality in Recent American Music," *American Music* 21/1 (2003), 112–33.

[203] Ibid., 113–14. For more insight into Bernard's third inquiry, see Robert Fink, "(Post-)minimalisms 1970–2000: the search for a new mainstream," in *The Cambridge History of Twentieth-Century Music*, ed. by Nicholas Cook and Anthony Pople (Cambridge: Cambridge University Press, 2004), 538–56.

[204] Bernard 2003, 130.

However, Bernard asserts that his assessment of postminimalist music "provides a more complete answer" compared to Johnson's assertion. While Johnson surveys postminimalist music within the whole of minimalist music, where technique fundamentally prevails over aesthetic and style, Bernard views minimalist music as an aesthetic which is "only incidentally a matter of style" and postminimalist music as encompassing "a whole host of styles and techniques."[205]

Thus far in this dissertation, I have assessed the signification behind the minimalist aesthetic and style by exploring works containing qualities in which one can interpret gestural activity. The signification behind the minimalist technique concerns the codification of compositional ideas shared across multiple works. Thus, in continuing the Peircean trichotomy, such ideas will be seen as symbolic. However, due to shared construction of Reich's postminimalist works, the idea of a symbolic gesture will have its limitations with respect to the overall signification.

4.1.2 *Music for 18 Musicians*, the predecessor

Reich of course did not abruptly begin composing postminimalist works. Following a trio of works from 1973—*Clapping Music*, *Music for Mallet Instruments, Voices, and Organ*, and *Six Pianos*—the end of his stylistic era was marked by *Music for 18 Musicians*. Considered to be one of his most famous works, *Music for 18* is a culmination of compositional features seen in previous works, notably pulse and pattern development. What separated this work was the introduction of harmonic sonorities. Harmony, for Bernard, strongly factored into the development of postminimalist works. He explains:

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[205] Ibid., 133n23.

> One way to tell the story of what happened after this initial establishment of minimalism might proceed through four basic stages: (1) Pieces became more complicated, which soon provoked (2) a greater concern with sonority in itself; as a result, (3) pieces began sounding more explicitly "harmonic," that is, chordally oriented, though not, at this point, necessarily *tonal* in any sense. Eventually, however, (4) harmony of an ever more tonal (or neotonal, or quasi-tonal) aspect assumed primary control.[206]

According to Bernard, introducing harmonic activity in *Music for 18* allowed Reich to "[pass] through stage 2 and into stage 3" of postminimalist music.[207] Regarding the complexity, it was also his biggest work to date since *Drumming* and called for musicians to double up on instruments (e.g., mallet instruments also played piano). Where I differ from Bernard is that, although it contains everything needed to be considered a postminimalist work, the aspect of culmination from the stylistic works keeps it part of his stylistic works. The work was unique in that it was so new yet familiar at the same time. Thus, there is as much merit to interpret *Music for 18* as the ending point of his stylistic works as well as marking the beginning of his postminimalist works. The following analysis will show aspects from both sides.

Again, the compositional foundation for *Music for 18* is made up of three components: pulse, pattern, and harmony. The first two stem from Reich's stylistic works. The entire work has a constant eighth-note pulse played by marimbas and piano. Example 4.1 shows the beginning of the work.[208]

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[206] Ibid., 114, emphasis in original.

[207] Ibid., 115.

[208] Like *Drumming*, Boosey & Hawkes created a score following *Music for 18*'s premiere in 1976. Composer Marc Mellits transcribed Reich's original manuscript in 1997, and the new version with separate parts was published in 2000. See Steve Reich, *Music for 18 Musicians* (New York: Hendon, 2000), ix.

Example 4.1 Steve Reich, *Music for 18 Musicians*, mm. 1–3.

The intricacy behind the pulse extends from what was seen, for example, in *Music for Pieces of Wood*. With a quarter-note tempo at 204–210, the eighth notes are divided into onbeats, played by Marimba 1 and Piano 1, and offbeats, played by Marimba 2 and Piano 2. The listener can only be aware of such a detail through score study or live/video performance, not by an audio recording alone. Given the ensemble arrangement in the score, the result is an ongoing alternation of performing pairs, most notably with the

marimbas. Thus, in playing the pulse, the crucial component that drives the work's performance, the "one-person job" has now doubled. This is an example of creating for larger ensembles, a point which I will discuss later.

Each section of the work contains a pattern, as shown in Figure 4.1. Most patterns are developed through the build-up technique, save for Sections IIIB and X. Many of the patterns from the sections also use the 3+2+1+2 signature pattern, with the addition of melodic contour. Along with the harmonic shifts, the patterns formally articulate new sections by switching the patterns themselves and the parts who play them. Each section is also formally articulated by the vibraphone, who is situated in the center of the ensemble so that every musician can see their playing. [209] The vibraphone's part is centered around signaling change into the next section. Such change greatly benefits the patterns as it creates enough salience to distinguish between sections.

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[209] According to Reich, the vibraphone's role of cuing pattern changes (and thus, formal sections) is taken from similar roles in Balinese Gamelan and West African drumming. See Steve Reich, *Writings on Music: 1965–2000*, edited by Paul Hillier (New York: Oxford University Press, 2002), 90.

Figure 4.1 Steve Reich, *Music for 18 Musicians*, patterns.

Though many of the patterns in the sections are built up to create unison patterns (i.e., no transpositional simultaneities), Reich does use the build-up technique to create composite patterns in Section V. Beginning the movement in m. 350, Pianos 1 and 3 present a unison pattern with has the same rhythmic profile as the main pattern in *Violin Phase*. In the following measure, Piano 2 *or* Piano 4 enters with a single onset; the other part enters in the following repetition of the bar.[210] The (stagnated) build-up occurs in mm. 351–360, where the two pairs create a composite pattern containing Pianos 1 and 3's t_0 pattern and Pianos 2 and 4's t_5 pattern. This is shown in Example 4.2. Reich then repeats the build-up process, but this time maintains the composite pattern with Pianos 3 and 4 and a new build-up pattern with 1 and 2. In m. 371, the build-up is completed and a new composite pattern containing t_0, t_4, and Pianos 1 and 2's new t_2 pattern. This is shown in Example 4.3. Shifting the pattern at the rate of a quarter note is an interval that Reich has used in past works including *Music for Pieces of Wood* and *Drumming*. Finally, in Example 4.4, Piano 1 drops out in m. 372 and re-enters with a two-measure "melodic pattern" while Pianos 2–4 maintain the composite pattern. This is new: composite patterns have served as a "backdrop" for resulting patterns in works like *Drumming*, but they have never supported a new idea that is not a result or a derivative of its own design. Rather than being the underlying material of interest and development, the composite pattern now acts as accompaniment. Piano 1's pattern is then strengthened with Marimbas 1 and 2 and Voices 1 and 2 playing in unison. Finally, these parts fade and begin a new pattern in m. 382, which is played into Section VI.

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[210] Steve Reich, *Music for 18 Musicians* (New York: Hendon, 1998), 100.

Example 4.2 Steve Reich, *Music for 18 Musicians*, Pianos 1–4, m. 360.

(1–3x)

Example 4.3 Steve Reich, *Music for 18 Musicians*, Pianos 1–4, m. 371.

(2–4x)

Example 4.4 Steve Reich, *Music for 18 Musicians*, Pianos 1–4, mm. 372–74.

Harmonic activity bookmarks *Music for 18* in the Pulse sections, and each harmonic sonority underlies the pulse and pattern development in each respective section. Figure 4.2 shows the harmonic sonorities. Performing the Pulse sections involves a gesture in which the dynamics paired with an agreed-upon number of repetitions create sound with the likeness of a breath—the dynamic swells of gradually getting louder and softer under one harmony emulates the act of inhaling and exhaling. This is shown in the Bass Clarinet parts in Example 4.5.

Figure 4.2 Steve Reich, *Music for 18 Musicians*, harmonic sonorities.
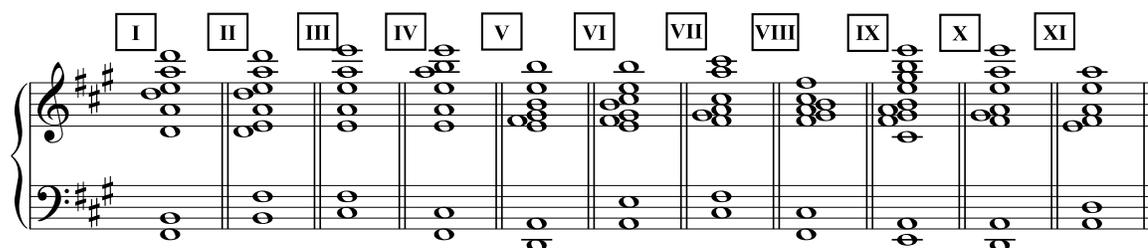
Example 4.5 Steve Reich, *Music for 18 Musicians*, Bass Clarinets 1/2, mm. 5–7.
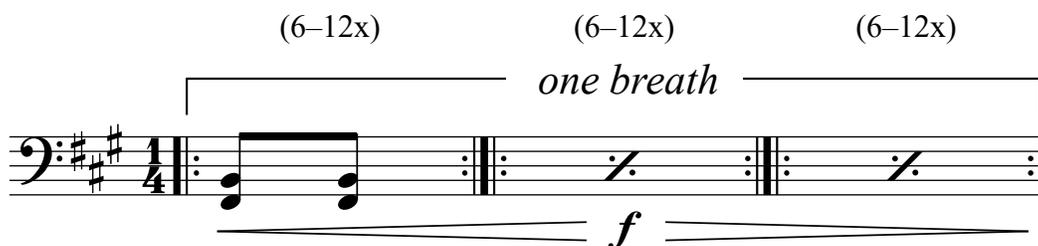
The emulation of the breath makes the sound iconically significant (i.e., the sound signifies breath by its likeness to one inhaling and exhaling), and with every "breath" brings a change in harmony.

Following *Music for 18*, this progression of "breath gestures" becomes a frequently used technique in Reich's postminimalist works. Due to the ever-growing scale of the ensembles and ideas in the works themselves, the other significant development to Reich's works is the more frequent use of the rehearsal measure which mark broader events in the music rather than measure-by-measure.[211] Finally, the work I cite to be Reich's first postminimalist work, *Tehillim*, did not immediately follow *Music for 18*. Works between these two include *Music for a Large Ensemble* (1978), *Variations for Winds, Strings, and Keyboards* (1979), and *Octet* (1979), which show Reich becoming more comfortable in writing for larger ensembles.

4.2 Gesture

To recall, in Reich's process music, the sound signified an iconic likeness to process itself, and the subsequent gestural interpretation was inferred by the attentive listener. Following this, Reich's compositions became more formally articulate, and an evolving performance practice helped solidify stylistic traits to communicate to the listener. Most notably, Reich's focus on the patterns and their development created significant indices for the listener to direct their attention. Subsequently, musical gesture in this stylistic era focused on both the communicative mediation from the performer to the listener and the synthesis of the more complex patterns and their respective developments within the works themselves.

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[211] Henceforth the "R-measure" and labeled "Rx," with x being the R-measure number.

Having discussed iconic and indexical gestures in Reich's works, one would expect the discussion to continue with symbolic gestures in his postminimalist music. However, Peirce's semiotic symbol is the most abstract of the previous two representamen from his second trichotomy. Because of the symbol's signification is derived by virtue of a law, convention, and the like, pinpointing symbolic musical gestures in a work is not as straightforward as it seems. David Lidov even goes as far as to say, "Gesture in music must be theorized as iconic and/or indexical, not symbolic."[212] I will examine this assertion by discussing the semiotic symbol and then show potential musical gestures in Reich's postminimalist music.

4.2.1 The semiotic symbol

The symbol is the most abstract sign from Peirce's second trichotomy. It does not directly or indirectly identify with its Object. Rather, symbols denote their Objects. Peirce describes the connection to the Object as such:

> The Objects—for a Sign may have any number of them [. . .] may have some other mode of being, such as some act permitted whose being does not prevent its negation from being equally permitted, or something of a general nature desired, required, or invariably found under certain general circumstances.[213]

Symbols operate under generalities, and it is from conceptualizing the Object as general that multiple subjects can agree upon the symbolic Object. Subsequently, the shared agreement creates the signification.

As such, Peirce defines the symbol as "a sign which refers to the Object that it denotes by virtue of a law, usually an association of general ideas, which operates to

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[212] David Lidov, *Is Language a Music?* (Bloomington: Indiana University Press, 2005), 8.
[213] Charles Sanders Peirce, *The Philosophy of Peirce: Selected Writings*, edited by Justus Buchler (London: Kegan Paul, 1940), 101.

cause the Symbol to be interpreted as referring to that Object."[214] The interpretation of the Object is thus dependent upon the symbol being qualified under generalities, such as a law, agreement, convention, arbitrary understanding, and other general types. If there is no interpretant, then there is no symbol.

4.2.2 A codified gesture?

Is there such thing, then, as a gesture that operates under convention in Reich's postminimalist music? In the *Music for 18* analysis, Example 4.5 showed a small, repetitive eighth-note figure instructed to be performed under one breath. Reich describes this as the "rhythm of the human breath," which, paired with the constant eighth-note pulse present in the entire work, create the two "different kinds of time occurring simultaneously."[215] As I discussed, the figure is meant to not only maintain a type of rhythmic and harmonic pulse, but also creates a breath-like quality to the sound itself. If I were to interpret this breath figure as a singularity, focusing on the quality itself, then it would be feasible to label this as an iconic gesture.

However, this "breath gesture," characterized by its pulse-based repetition and dynamic swelling, is present in many of Reich's works in the 1980s to the extent that it can be deemed a conventional compositional device. These grouped breath gestures all share the same placement and function: like *Music for 18*, they begin the work by presenting the harmonic sonorities in a full texture (i.e., the full ensemble will play) before moving to the primary subject matter of the work. Each change in breath gesture, and thus change in harmony, is marked by the next R-measure. The progressions

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[214] Ibid., 101–102.
[215] Reich 2002, 87.

themselves also share a cyclical construction, where the beginning sonorities return

following, at times, drastic changes in harmony. (Most of the time, this subject matter is a

pattern that goes through several canons.) Figures 4.3–4.7 show reductions of the

beginning harmonic sonorities in *Sextet* (1984), *Electric Counterpoint* (1987), *New York

Counterpoint* (1985), *The Desert Music* (1983), and *Three Movements* (1986),

respectively. The large-scale repeats in *Sextet* and *The Desert Music* mark entrances of

held tones by new instruments. Vibraphone enters in the former and brass enter in the

latter. *Sextet*, *The Desert Music*, and *Three Movements* begin with an underlying pulse as

was seen in *Music for 18*. The *Counterpoint* works begin with the breath gestures.[216]

Nevertheless, these works that make up the majority of Reich's output in the 1980s share

the same framework through their respective progressions of breath gestures.

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[216] In the context of score formatting, Reich does not begin the first notated measure
(beginning) with R1. Therefore, the R-measures do not directly align with the beginning
of the breath gestures. *Sextet* is an exception due to the brief introductory pulse rhythm
played by piano.

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Figure 4.3 Steve Reich, *Sextet*, I, opening reduction.

Figure 4.4 Steve Reich, *Electric Counterpoint*, I, opening reduction.

Figure 4.5 Steve Reich, *New York Counterpoint*, I, opening reduction (transposed to concert pitch).

Figure 4.6 Steve Reich, *The Desert Music*, I, opening reduction.

Figure 4.7 Steve Reich, *Three Movements*, I, opening reduction. [217]

The grouped breath gestures in each work can be defined as strategic types, a term

by Robert Hatten describing gestures where the "articulations, dynamic shading, and

temporal shaping may be as important, or even more important, than its pitch-motivic

relationships in the unfolding thematic discourse."[218] Though Hatten's strategic type of

gesture is applied in a thematic context to the work, the breath gestures create a profile

that Reich uses to outline the harmonic work. Whereas many works rely on a previous,

underlying syntactical understanding of the compositional machinations (e.g., operating

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[217] Due to the brief key changes, the reduction for *Three Movements*, I, presents the
sonorities under no key signature for a cleaner presentation.
[218] Robert Hatten, *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven,
Schubert* (Bloomington: Indiana University Press, 2004), 177.

in a diatonic system), Reich presents the syntax in these works individually. However, as the strategic types have shown, there is a formulaic element to the construction in several of Reich's works. The strategic types shown above turn what is a both melodic and harmonic figure that, emulating the breath, into a conventional strategy.

Back to Lidov's point, is there such thing as a symbolic gesture? Figures 4.3–4.7 suggest the affirmative and is especially true in a work like *Electric Counterpoint*. It allows the swelling figuration in this work for electric guitar to exhibit a likeness to breathing without being a wind instrument, meaning this symbolic gesture goes beyond the work not being for wind instrument in favour of a subject recognizing the same figuration throughout several works. However, because the significance is tied to the conventional aspect of Reich's compositional practice, there is not much else to say about the signification behind postminimalist works in the context of gesture. Rather than looking for novel musical gestures in these works, finding other symbolic representations to uncover the significance in Reich's postminimalist music is more prudent.

4.3 The Analyst

In Reich's process works, the music inherently communicates musical gesture to the subject, the attentive listener. In his stylistic works, the performer's choices communicate musical gesture to the same subject. While exploring musical gesture has been the focus of this dissertation, we have come to a point where the meaning in Reich's postminimalist music must look beyond what Reich has given us in such works to merit the equivalent type of significance. As was shown in the previous section, Reich's music in the 1980s is constructed in formulaic typologies. What is considered to be strategic or "symbolic" gestures underlies the framework. These symbols, as Peirce discusses, are a

symptom of growth out of the icon and index.[219] This is but a feature of the minimalist

technique, where attributes are shared across multiple works. The signification is still

there, but one must look beyond the score and put aside gesture to find it.

In order to continue operating under the semiotic symbol, the remainder of this

chapter will reexamine previous analyses of Reich's postminimalist works. Again,

symbols operate by virtue of a conventional system. Thus, the rules of harmonic,

melodic, and rhythmic syntax in music theory serves at the basis of symbolic operations

to inferring signification. This means that the analyst will communicate a general

signification to the subject, the reader. Below I will discuss the structure behind this

meta-theoretical approach. Following this section, I will apply this approach to two

formalist analyses of Reich's postminimalist music: John Roeder's beat-class modulation

in the several postminimalist works and Ian Quinn's contour analysis in the third

movement of *The Desert Music*. [220]

4.3.1 Analysis as a Third

Approaching these analyses will be much like my approach to gesture. Both are

inferred from a mediated interpretation of their signified object. Along with presence

within the medium itself—the music, the score, the sound—such interpretation is

dependent on stylistic conventions to inform said mediations. These styles offer a range

of possibilities to the one who infers and/or communicates gesture as well as the one who

infers types of significations in the form of analytical methodologies. The latter in this

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[219] Peirce 1940, 115. Peirce particularly notes the growth coming out of icons, and the breath gestures exemplify such growth.

[220] Ian Quinn, "Fuzzy Extensions to the Theory of Contour," *Music Theory Spectrum* 19/2 (1997), 232–65. John Roeder, Beat-Class Modulation in Steve Reich's Music," *Music Theory Spectrum* 25/2 (2003), 275–304.

case is the analyst.

My approach to the two articles must still retain some notion of Peirce's categorical "thirdness" and its respective significance, just as the previous two chapters have focused on firstness and secondness in the context of the signs in Peirce's second trichotomy. In terms of their presence, Cumming describes the three Peircean categories as follows: a First is "an item of possibility" that can be defined as a "May-be"; a Second is a "concrete thing" defined as an "Actual"; and a Third is a "Would-be," which, like the "May-be," is a possibility, but its significance is "arrived at through deliberation" and contingent upon conventions.[221] She further elaborates on the Third by generalizing it as, "X would be so because Y (set of conventions) is working here."[222] Analysis itself works in this realm. The interpretive conclusions from an analysis, the X, takes on the "Would-be" status because of the analytic set of conventions, Y, that have been previously established.

From this, we can surmise two important aspects in every analysis. First, analyses are grounded in a set of conventions (the Y) to create an appropriate interpretation (X). Much of these conventions, including but not limited to harmony, melody, rhythm, and form, have been codified in types of syntax. For example, harmony, arguably the most prominent syntax music theory has established, is represented by Roman numerals, scale degrees, function, and positioning (i.e., figured bass). Second, analyses should invite possibility. Without it, there is no "Would-be," only an "Is."

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[221] Naomi Cumming, *The Sonic Self: Musical Subjectivity and Signification* (Bloomington: Indiana University Press, 2000), 79.
[222] Ibid.

4.3.2 Renegotiating the analyst

In her book *The Sonic Self*, Cumming aims to bridge the divide between the structuralist's attention to "rules" and the aesthetician's goal to uncover the meaning when creating analytical interpretations. The result is a "renegotiation of disciplinary boundaries" such that both analytical methods can extract analytical aspects and ideologies from their counterpart.[223] My goal is to add further referential insight into Roeder's and Quinn's analyses, both of which offer formalist perspectives on Reich's postminimalist music. Given that the minimalist technique is a more polished version of the minimalist style, much of the analytical considerations from Chapter 3 will be revisited in this chapter.

In either formal or referential analyses in music theory, the goal is to present significant findings that, at best, impact a subject's understanding of the music and potentially alter their preconceived notions. In formal analyses, according to Cumming, "perceptual judgments are made of a musical passage as having certain points of structural significance, and these judgments are presented using varying criteria of selection."[224] Typically, said significance is expressed through diagrams, networks, outlines, and reductions. Figures 4.3–4.7, which formally show the symbolic gestures, are examples of reductions. They only showed what I need to draw the reader's attention toward. Cumming explains the significance behind this.

> If it is understood that a schematic presentation is necessarily incomplete, the sense in which it "represents" musical content is thus considerably weakened. The diagram is not an attempt to contain the essence of the music but more of a heuristic device, directing the viewer to gain a perception of certain aspects of

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[223] Ibid., 168.
[224] Cumming 2000, 171.

structure and their qualitative possibilities, which can be translated into a way of hearing connections that might otherwise have been less accessible.[225]

My reductions show a consistent pattern throughout several works. As Cumming points out, it is not meant to show everything, and therefore incorrectly describing them as "incomplete" would weaken their representational purpose. My insight into the following articles will not only comment on their respective representations (graphs, tables, reductions, etc.), but will aim to bridge the divide between referential and formalist perspectives.

4.4 Bolstering Pattern Significance in Reich's *New York Counterpoint*

The first factor in a suitable analysis is the conventional foundation from which a methodology is derived. In John Roeder's 2003 article on Reich's music, the aim is to create a newer rhythmic syntax from Cohn's 1992 model of transpositional beat-class sets that incorporates elements from harmonic syntax, notably a beat-class "tonic" and "modulation."[226] In my discussion of Roeder's analysis, I will comment on his adaptation, its analytical significance, and how it extends the concept of textural repetition that I discussed in Chapter 3. Roeder's analyses, specifically on Reich's *New York Counterpoint*, highlights how build-up and composite patterns evolved when factoring in instruments other than percussion playing these patterns.

4.4.1 Roeder's analysis

Roeder's analysis is motivated by two questions: What is the pattern's function in Reich's postminimalist works, which have more "variegated textural and harmonic

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[225] Ibid., 176.
[226] See Richard Cohn, "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Perspectives of New Music* 30/2 (1992), 146–77.

designs," and "how are tonal and metric processes coordinated?"[227] These questions stem from the techniques used in Reich's stylistic works that developed into a more systematic use in the postminimalist works.[228]

Roeder's ultimate goal is to determine musical form in Reich's postminimalist works by concentrating on rhythmic syntax. To create a template, common-practice musical from is marked by tonal events. The most significant event is the cadence, which brings tonal resolution in low or high degrees of conclusion (e.g., the half and authentic cadence, respectively). Further, the form is impacted by the work's tonic and subsequent development. Though Reich's works do not employ tonality of the common practice, Roeder asserts that rhythm can mark formal events that are metaphorically equivalent to harmony.

To create a type of rhythmic syntax, Roeder develops "a model that shows how both tonality and meter depend on pitch, harmonic, and other accentual features of the patterns as they are combined polyphonically."[229] The model itself is developed through three analyses. First, *Six Pianos* is used to consider accent and its function. Second, *New York Counterpoint* is used to establish the model which qualifies different types of

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[227] Roeder 2003, 277–78.

[228] In reference to previous works, Roeder notes Reich's "abandonment of phasing for other formative processes" in his discussion of the composer's "current technique" (Ibid.). To recall, *Drumming*, a work situated in Reich's stylistic period, was the final piece to use phase. Further, its use was not dependent upon a form-content fusion as was seen in the early process works. This is to say that phase, a novel concept in its time, is still used by analysts to distinguish Reich's works, yet there was a significant time span between *Drumming* and works like *New York Counterpoint*. However, Roeder's term "post-phase music" seemingly oversimplifies Reich's output (Ibid., 290). My hope is that this dissertation, specifically Chapter 3, shows there is a time in between works that use and do not use phase. This issue will come up again in Quinn's analysis.

[229] Roeder 2003, 277.

accents and how they affect a beat-class "tonic" and "mode," with one such effect being a "beat-class modulation." Finally, the fourth movement of *The Four Sections* further expands on Roeder's model.

The accent is the crux of this theory. Citing Wallace Berry, Fred Lerdahl, Ray Jackendoff, and Jonathan Kramer's research on rhythmic theory,[230] Roeder gives the following definition of an accent as:

> [. . .] a perceived emphasis, at a point in time, that may arise in at least three distinct ways: from perceived *changes* in pitch, duration, loudness, and in more complex musical processes of harmony, timbre, and texture; from expectations of regularity such as *meter*; and from the perceived *function* of the events at that timepoint in the *structure* of melodic and harmonic segments.[231]

All three of the accentual emphases rely upon the subject's perceptual faculties to distinguish something as more emphasized than what is around it. The first two emphases contrast each other: the subject is to look for both change and (the expectation of) regularity. Change can subvert our expectations of regularity, but it is by regularity that we can confirm change has occurred. How this is qualified is provided by the third accentual emphasis of function, focusing on the how and why the accent behaves as such.

From this, Roeder creates a new typology of accents called *intrastream* accents occurring within a polyphonic texture. The accents include Attack, Climax, Nadir, Duration, Subcollection, Beginning, and Pulse. A reproduced version of Roeder's intrastream accents can be found in Figure 4.8.[232] The "if and only if" (iff) proofs can be

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[230] Wallace Berry, *Structural Functions in Music* (Englewood Cliffs, NJ: Prentice-Hall, 1975); Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge, MA: MIT Press, 1983); Jonathan D. Kramer, *The Time of Music: New Meanings, New Temporalities, New Listening Strategies* (New York: Schirmer, 1988).

[231] Roeder 2003, 280, emphasis in original.

[232] I want to thank John Roeder for granting me permission to use and reproduce examples, tables, and figures from his 2003 article in *Music Theory Spectrum*. The article

daunting to those not versed in mathematical terminology, but Roeder provides the reader

with qualitative definitions for each intrastream accent in his prose. Shown as the last row

in the table, the Attack accent is synonymous to an onset. The Climax accent "appears at

the onset of an event whose pitch exceeds those of the preceding and subsequent

events."[233] The Nadir accent "appears at each onset of each event whose pitch is equal to

or lower than the lowest pitch so far, and that is lower than the immediately preceding

and following events."[234] These two accents concern the contour limits of each event.

The remaining intrastream accents pertain to the accent's positioning within each

event. The Duration accent "appears at the onset of an event that is much longer than the

preceding event, or when the time to the next onset is much greater than the time since

the last onset."[235] In other words, the Duration accents mark long events. The

Subcollection shift accent concerns harmony. Roeder explains, "In the patterns Reich

composes from such collections, the change from a given pitch to an adjacent pitch in the

diatonic scale marks a change of harmony more than do leaps," meaning that the accent

falls on a change in diatonic mode by stepwise motion.[236] The Beginning accent marks

the boundary between events. Roeder asserts that, from Reich's "highly constrained

rhythms," there comes a point where successive events appear on "immediately

successive beats," with the latter event changing to a shorter interonset duration, and thus

creating a boundary.[237]

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cited in Roeder's formulae is John Rahn, "Relating Sets," *Perspectives of New Music*
18/1–2 (1979–80), 483–98.
[233] Roeder 2003, 280.
[234] Ibid., 284.
[235] Ibid.
[236] Ibid., 285.
[237] Ibid., 286.

Figure 4.8 John Roeder's intrastream accents (Table 4).

Given a monophonic stream S presenting a series of n non-overlapping events of the form (pitch, duration, timepoint of attack):

$$S = \langle(p_1,d_1,t_1),(p_2,d_2,t_2),(p_3,d_3,t_3), \ldots,(p_n,d_n,t_n)\rangle$$

such that, for all i ($1 \leq i < n$), $t_{i+1} \geq t_i + d_i$.

Quantify the pitches p_i according to the integer model of pitch (Rahn 1980), and model pitch differences (intervals) as integers. Find a duration of which every timepoint t_i and duration d_i can be expressed as an integer multiple. Qualify this duration as 1, and quantify the t_i and d_i accordingly as integers.

At t_i there is an accent of

	symbolized by	iff
Climax	C	$p_i > p_{i-1}$ and $p_i > p_{i+1}$
Nadir	N	$p_i < p_{i-1}$ and $p_i < p_{i+1}$ and $p_i \leq p_j$ for $1 \leq j \leq i$
(Interonset) Duration	D	$d_i \gg d_{i-1}$ or $t_{i+1} - t_i \gg t_i - t_{i-1}$
Subcollection shift	S	There is an integer $k < i$ such that $0 < |p_i - p_{i-k}| \leq 2$ (semitones) and there is no j: i–k < j < i such that $0 < |p_{i-k} - p_j| \leq 2$ (semitones)
Beginning of connected series	B (local)	$t - t_{i-1} > 1$, and there exists $m > i$ such that for all j: $i \leq j < m$, $d_j = 1$ and $t_{j+1} = t_j + 1$
Pulse	|	There is an accent of one of the types defined above at $t_i - T$ and at $t_i - 2T$; or there is a pulse accent at $t_i - T$ and an accent of one of the types defined above at $t_i - 2T$ and at $t_i - 3T$
Attack	●	p_i exists [an event (not silence) is attacked at t_i]

Finally, the Pulse stream "accents timepoints *metrically*" from "regularly repeating durations."[238]

As the table shows, each accent is given a term, a label, and a proof (definition), all of which are symbolically significant. Their signification can be inferred on the basis that usages of conventional terms will have specific analytical applications. These terms are derived from their general use (i.e., climaxes indicate a high point, pulses are ongoing, etc.), yet, through Roeder, they now have a new context and function. The reader's understanding and adoption of the terms in their new context is enough to constitute being a symbol. Therefore, because these accents serve as the basis of formalizing Reich's works through a rhythmic syntax of tonic and mode, my goal is to expand upon this analysis with a focus on creating a more referential perspective on Roeder's formal accents.

4.4.2 Analyzing Roeder

To assist us in the signification behind the approach to analysis, Cumming asks, "How can the aspects of tonal order codified in rules for harmony or counterpoint (and their broader application) assist in predicting the general types of signification that will appear in particular works?"[239] Though some of Roeder's analysis takes harmony into account, the primary focus is rhythm. If we were to modify the question to account for rhythm and accent as it pertains to the form, the question would then be, "How can aspects of formal order codified in Roeder's rules for rhythm, particularly in the context of patterns, assist in predicting the general types of signification that will appear in

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[238] Ibid., 287, emphasis in original.
[239] Cumming 2000, 169.

Reich's postminimalist works?" As Roeder outlines, the formal order is determined

primarily by an inherent accent motivated by the patterns and their respective underlying

rhythms. Couple this with exploring Reich's systematic use of the build-up technique and

the signification will emerge. Therefore, the more intersubjective the interpretation is—

which, in this case, relies upon Roeder's model of accents (i.e., an analytically symbolic

representation of the music)—the more predictable the subject's inference is of

understanding the formal order. This is how thirdness is attained, where the "Would-be"

status of the interpretive conclusions rely upon previously established conventions.

I will focus particularly on Roeder's *New York Counterpoint* analysis, which is

central in establishing his formal theory and the types of accents and beat-class

modulation discussed in the previous section. The goal is to re-examine Roeder's

structural aspects through a referential lens in order to create a synthesized perspective of

the work. I will revisit the idea of textural repetition, which was previously discussed in

my *Music for Pieces of Wood* analysis in Chapter 3, to help conceive of how the

intrastream accents build on the effects from the stylistic era with harmony and melody

now being considered.

To begin setting the article within a referential perspective, I will present *New

York Counterpoint*'s beginning build-up patterns in the same way that I did in my *Music

for Pieces of Wood* analysis. Figure 4.9 shows patterns Q1–Q6 spanning from R8–R33.

Every build-up pattern is played by Live Clarinet save for Q1, played by Clarinet 1.[240]

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[240] Though *New York Counterpoint* can be played with a full, live ensemble, I will
approach it in the live/pre-recorded performative context.

Figure 4.9 Steve Reich, *New York Counterpoint*, patterns Q1–Q6.

With a focus on perceptual salience, each build-up that I have indicated ends at the R-measure where the final onset or onsets are added to complete the patterns. Following the pattern completion, the build-ups in Q2–Q6 have a repeated R-measure, with a "fade out" instruction for the Live Clarinet (and, at the same time, one of the taped clarinets fades in the same pattern), followed by an R-measure of rest. This explains the two-R-measure gaps between each build-up pattern (R13–R14, R18–R19, R23–R24, and R29–R30). Reich does not waste time in moving to the next build-up, a trait carried over from his stylistic works. Thus, for the sake of consistency on my end, omitting these R-measure gaps is intentional.

Roeder divides *New York Counterpoint*'s build-ups of Q1–Q6 into two stages: Stage 1 spans from R8–R19 and includes Q1–Q3, and Stage 2 spans from R20–R33 and includes Q4–Q6. Stage 2's patterns are a tenth below Stage 1's patterns with some exceptions due to the clarinet's register. He also notes that in Stage 2, "Each pattern rapidly and irregularly builds up a beat-class set that is identical to a pattern in the first stage—Q4 builds up the same beat-class set as Q1, Q5 builds up Q2's set, and Q6 Q3's."[241] The pairings are correct, but the pattern build-ups are not as irregular as one would think. In the Boosey & Hawkes score, there is regularity in the specified repetition given to the R-measures which corresponds to each of the build-up pairs. In the Q1/Q4 build-up, the repetitions are x3+x3+x2; in Q2/Q5, it is x3+x2+x1+x2 (a potential nod to Reich's signature pattern in the context of repetition); and in Q3/Q6, it is x3+x2+x2. All three pairs also have the same "buffer" R-measure repetition, where the Live Clarinet

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[241] Roeder 2003, 280. Q1 does not build up because it initiates the "counterpoint" section. However, as Q2, Q5, Q3, and Q6 show, in their respective pairings, we can theorize that Q1 could have been built up the same way as it does in Q4.

fades out the pattern in one R-measure and then rests in the next R-measure before moving to the next pattern. The repetition in this fade-out + rest R-measure grouping is x2+x1. Again, always working under the premise that Reich is systematic in every aspect shows that it extends to the specified number of repetitions and thus creates a regularity in the build-up sections.

Figure 4.10 shows the R-measures where every build-up pattern finishes in Stages 1 and 2. As explained previously, the pattern completed by the Live Clarinet is transferred over to the next Clarinet part to further thicken the composite pattern's texture. The density of the texture will affect the repetition of the build-up patterns, both when beginning as a rhythm and ending as a complete pattern.

Figure 4.10 Steve Reich, *New York Counterpoint*, I, select composite patterns.

4.4.2.1 Intrastream accents' repetition and salience

With the patterns established within a similar context to my analysis of *Pieces of Wood*, we can now consider Cumming's concept of "renegotiating" the boundaries between Roeder's formal procedures and an approach that considers the perception of musical meaning.[242] Along with creating a rhythmic syntax to explain formal order, Roeder writes two significant passages concerning the subjectivity of the listener. The first one follows his discussion of intrastream accents, explaining why Reich's music affects the quality and salience of the accents:

> Although many of these definitions are consistent with other theorists' treatment of accent, I do not intend their formality to suggest that all these accents are aurally salient in all music. Nadir accent, for example, is arguably negligible in the more usual styles of music that presents a given melody once or twice. These accents can be heard in Reich's music, however. Indeed, it is precisely the unusual features of his music—its repetitiveness and redundancy—that permits the listener to focus on such accentual subtleties as nadir, and then to consider their participation in distinctive, large-scale rhythmic processes. The formal definitions provide a basis for a precise description of rhythmic form, as we shall see, and also for the evaluation of such descriptions."[243]

I agree with the premise but take issue with the language. As I discussed back in Chapter 2, repetition is necessary to establish salience in Reich's process music. The same principle has applied through his stylistic music. For example, repeating each measure in a build-up pattern heightens the anticipation of where and when the next onset will be. This carries over into works like *New York Counterpoint*, yet must be modified to the type of build-up Reich uses. Though the technique evolves, the salience factor remains—repetition establishes individual, salient events (e.g., one build-up measure to the next)

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[242] Cumming 2000, 168.
[243] Roeder 2003, 287.

for the listener to discern. Such repetition is not only applicable, but crucial to discerning the build-up pattern from the ever-growing composite patterns within a given passage.

This repetition—which, as Roeder describes in the quote above, would admittedly be "unusual" in the context of common-practice music—is not only usual but essential to Reich's music and most minimalist music. Again, Roeder's language might suggest the opposite, but we agree with distinguishing how salience works between common-practice music and Reich's. However, what I disagree with is labeling Reich's music as redundant along with repetitive. Redundancy implies that Reich's compositions are superfluous, or repetitive for the sake of being repetitive. Due to the minimal amount of material composers use, repetition controls the rate at which minimalist music progresses, and every composer within this genre has their own way of determining the control. For Reich, his use of repetition becomes more systematic through the years.

To recall, David Lidov's textural repetition in Reich's stylistic works directs attention away from of the repeated patterns to other musical aspects, subsequently creating gestures that influence the listener's differentiation between composite patterns and build-up patterns. The listening subject will preferably direct their attention toward build-up patterns over composite patterns due to the former's ongoing development. Each build-up pattern starts as a simple rhythm and is reliant on the composite pattern. This continues until the build-up pattern has enough onsets to become independent of the composite pattern. Furthermore, Lidov asserts that the tension in a work containing textural repetition can result in the listener resisting the change of reference.

I conclude in Chapter 3 that due to the fact that Reich purposely does not stay on a complete build-up pattern for long, the resistance of a listener's attention is minimal in

the stylistic works. This is also applicable in the postminimalist works during every

moment of the "buffer" measures discussed above. However, in further attempts to

systematize and thus codify his compositional practices, there are three significant ways

in which Reich streamlines the build-up pattern in his postminimalist works that can

subsequently affect the listener's attention. First, regarding onsets, the beginning pattern

does not always start with one onset, more than one onset can be added going into the

next build-up measures, and the onsets within each measure can differ in duration (e.g., a

mixture of quarter notes, eighth notes, and dotted quarter notes). Placing quarter notes

and dotted quarter notes on weak beats introduces syncopation. To counter the potential

emphasis on the weak beat, Reich adds tenuto markings above the note to ensure the

onset attack remains even compared to the others and that the entire note's duration is

played. More variables to consider in the onsets means more variety in the build-ups

themselves.

Second, to accommodate for syncopated rhythms within the measure, like the

dotted quarter note, the beat-class transposition t_n of the patterns now include odd-

numbered *n* transpositions in a 12-beat measure. For example, Q2 in *New York*

Counterpoint has a t_5 relation to Q1. Patterns that are only one eighth note apart (t_1) can

be interpreted as a synthesized version of the composite pattern development in Reich's

process music. In his phase-as-process works, the pattern almost always moved one beat

(usually an eighth note) ahead in every moment of the phase shift. Composite patterns in

Reich's postminimalist works develop at a slower rate due to the build-up technique,

which creates a completed transposition of the pattern.[244]

Third, regarding repetition, consecutive build-up measures do not always have the same number of repetitions. They are specified in the score, as shown in Figure 4.9. This adds an element of unpredictability to the unfamiliar listener and thus potentially heightens anticipation. Unfamiliarity might seem to contradict my previous defense of regularity in Reich's repetition, but the former descriptor concerns the listener, and the latter concerns the analyst. Again, Reich still retains a systematic approach to his compositional process in his postminimalist works, which includes his choice in the number of repeats for every build-up measure.

Pairing these three "updates" with the new melodic and harmonic components of the postminimalist works means that new considerations must be made when attending to the accents within the build-up patterns. When discussing the accent's development within the build-up pattern, Roeder provides three guidelines. First, beat-class accentuation varies over time because some accents take more time to establish more than others (e.g., Climax and Pulse). Second, an accent attributed to an onset will vary depending on how built up the pattern is currently versus when it completes. Third, when attending to the accents, "one hears hardly an exact repetition in this nominally 'repetitive' music."[245]

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[244] In this sense, one can postulate that there is no "shifting" of patterns in postminimalist works at all (this might be applicable to his stylistic works following *Drumming*). It is true that the end result of a build-up pattern is typically a transposed version of one underlying pattern (3+2+1+2; 3+1+3+1) chosen for the work or, more locally, a passage (e.g., patterns in each part of *Music for 18*). However, that conclusion is made at the end, and to prescriptively attribute such a conclusion to a pattern before it builds up is illogical. This is because the build-up never begins with a pattern: it begins with an onset or short rhythm. Therefore, Reich's choice is not one of shifting, but one of placement.
[245] Roeder 2003, 287.

Let us consider these three guidelines when paired with textural repetition. Starting with Roeder's third guideline—not only can the accents contribute to creating streams of singular, particular repetitions of the pattern (or just the "rhythm" in the early stages of the build-up), but they can also affect how the listener attends to the composite pattern versus the build-up pattern. Thus, shifting the attention to the composite pattern versus the build-up can affect the accents. This proves Roeder's first guideline—when the build-up begins more as a rhythm than as a distinct pattern, some accents are not present because the pattern has not been built enough yet. This also answers Roeder's second guideline—accents might be present (i.e., the onset to which they are attributed is there), but the pattern is not built up enough for them to be sufficient to qualify.[246] Therefore, textural repetition can explain the subject's shift in attention to both the build-up pattern's quality and Roeder's intrastream accents.

4.4.2.2 Rhythmic modality

The second disclosure that Roeder makes concerns the perception of rhythmic tonic and mode compared to its tonal counterpart:

> Modality is perceived differently in these two domains, so I do not claim that the "distinctive" structures that characterize pitch-class modes (triads, which are asymmetrical subsets of the total chromatic) are perceptually equivalent to those that characterize beat-class modes (usually pulse streams, which are symmetrical subsets of the beat-class aggregate). Yet the correspondence runs much deeper that [sic] has been previously discussed, and I will show that such a 'modal' conception of rhythm is essential to understanding metrical and other large-scale processes in Reich's post-phase music.[247]

Modality in this application is as much about its general, perceptual function as it is about

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[246] This conclusion can also be applied to Roeder's first guideline. It comes down to the onset being there and thus how explicit the accent is.

[247] Ibid., 290.

its syntactical one. For the purpose of this analysis, and this entire dissertation for that matter, the mode of perception that is of interest is hearing. Furthermore, understanding harmonic mode aids the reader in applying its concepts to Roeder's beat-class mode. As notes are grouped together in a scale in relation to a tonic pitch, Roeder's "beat-class mode" is defined by accents grouped together as well as "their temporal relation to the beat-class tonic."[248] The beat-class tonic is the onset within a time span that "acts as a reference for the other accented beat classes, in the sense that one perceives their temporal position in terms of the interonset durations from it to them."[249] Finally, any changes in tonic or mode are defined by Roeder as a "beat-class modulation." Specifically, it can include "changes in the membership of the beat-class collection itself, or from changes in the types, strength, and placement of accent within a continuing collection." As also seen in tonal modulations, the result of such changes in beat-class modulations "create large-scall contrast, progression, and return."[250]

Focusing on modulation, we can broadly state that its purpose is to present perceptual and syntactical change. Roeder is specifically concerned with questions of where and how one focuses an underlying beat-class mode. The question of how can be attributed to a change in the beat-class collection. The question of where, though, has more variety and, potentially, more ambiguity to it. This has been discussed already in the context of the pattern and textural repetition. Lidov explains in further detail how change plays a role in textural repetition:

> One aspect of the quality of consciousness enhanced by textural repetition is heightened sensitivity to detail. Anticipating my final example, the Trio of the

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[248] Ibid., 289.
[249] Ibid., 288.
[250] Ibid., 289.

> Scherzo of Schubert's Sonata in B-Flat Major, D. 960, which is discussed in the next section, is an ideal example of textural repetition. Its relatively complex, syncopated, two-bar rhythm appears in fourteen consecutive versions (twenty-eight with repeats). The effect is that the repeating rhythm, acquiring a pervasive but subliminal presence, refers our attention to the tiniest nuances of voice leading, stress, articulation, and, of course, harmony, which become significant gestures imbued with evocative power.[251]

Composite patterns in Reich's postminimalist music share similar qualities with the Schubert rhythm that Roeder cites. Both of them have an underlying presence in the music and has the potential to affect everything around it. I would characterize composite patterns as pervasive, but, due to their ever-growing texture and impact on the work's development, I would not characterize them as subliminal. As shown in Figure 4.10, the textural repetition changes every time the texture thickens and thus a listening subject should be able to attend to new iterations of the composite pattern.

Minimalist and postminimalist music operates on slight changes, and the types of changes are determined by how much nuance is present. For Reich, the more complex the work is (e.g., postminimalist works), the more nuance is present. More nuance means more analytical considerations. Roeder's intrastream accents and beat-class modality present ways to group the patterns, mark changes in their structure, and determine the patterns' impact on the overall form. As Lidov explains, textural repetition refers the listener to gestures resulting from nuance. As discussed in Chapter 3, the composite pattern itself (as a singular thing) is not enough to deem it a suitable gesture. The nuances Lidov mentions are all of interest to Roeder, as they are the qualities found within his accents.

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[251] Lidov 2005, 37.

4.4.2.3 Indexical or symbolic gestures?

If we were to follow the same gestural interpretants from Chapter 3, then the build-up patterns will create an indexical gesture. With a more sophisticated method of the build-up pattern in postminimalist music, more can be inquired when applied in the context of the minimalist technique. First, can build-up patterns with labeled accents strengthen the indexing towards the composite pattern, also with labeled accents, compared to the stylistic works? They certainly bolster the quality of both build-up patterns and composite patterns. Attributing qualitative emphases to an onset can help one better understand the inherent qualities within the pattern, and this is especially true when harmony and melodic contour are involved rather than a rhythmic pattern on one pitch. Therefore, the indexing would not necessarily be stronger in this case, but rather more articulate in its design given the analytical method that one follows. In this case, Roeder's accents help better articulate the build-up patterns in Reich's postminimalist music given the new harmonic and melodic variables present.

Perhaps this means that a different kind of indexing is used because of the different analytical approach. Although a different methodology is used, the mediated interpretant that is gesture should still, at its core, be more or less the same. In other words, the semiosis still involves the pattern as the object being signified. Further, the composite patterns are motivated by textural repetition, and the listener is directed toward them by the build-up patterns. This is possible due to the changes and nuance involved in the build-up technique. Therefore, the indexing involving the build-up technique, directing our attention to and from a composite pattern, is a similar type of semiosis in Reich's postminimalist music as it was in his stylistic works.

Finally, if postminimalist music represents a point at which techniques from the stylistic works are codified and thus used throughout multiple works, does this mean that these indexical gestures can reach the status of thirdness by simply being used in postminimalist works? Not exactly. Peirce's trichotomies do not have to operate on hierarchical levels: it is not the goal of a sign that exhibits secondness to move or "elevate" towards thirdness. It simply just belongs in the secondness category, which has specific qualities (e.g., singularities, actualities, things that direct one towards something). This means that although the musical context has changed, the indexical gestures do not change their status. They are the best representation of the object and therefore the most appropriate interpretation in describing the compositional activity.

4.4.3 Closing

Coupled with textural repetition, Roeder's typology of accents provides analytical context benefitting the reader and listener when interpreting Reich's patterns in his postminimalist music. The formalist analytical framework provides the reader and listener an interpretation in how to group the patterns. Adding in reference from Reich's stylistic era gives much-needed, further analytical context to better understand how his compositional methods evolved over time. Roeder's formalist approach helps ground the same kind of signification found in the stylistic works in the build-up and composite patterns found in Reich's postminimalist works.

4.5 Analytical Possibility in *The Desert Music*

The second factor in what makes a good analysis is the degree of possibility it presents. This is why the academic discipline of analytically discerning things of interest in music is called music theory, not music law. In his 1997 article, Ian Quinn combines

aspects of fuzzy set theory with the theory of contour to create a suitable method of identifying contour membership in Reich's *The Desert Music*. Following my summary of the article, my main focus is to recontextualize Quinn's formalist approach to contour back to a focus on the pattern, with its recognition and signification reliant upon possibility and potentiality.

4.5.1 Quinn's analysis

In the article, Quinn focuses on sixteen different melodies played by Violin 1 and Flute located in the "outer" portions of the third movement labeled "Slow." These melodies, grouped together as a family labeled **M**, are shown in Quinn's Example 1, which has been reproduced in Figure 4.11 below.[252] The melodies m_1–m_{4b} are located in the first outer "Slow" portion of the movement, and m_5–m_{8c} are located in the second portion. Notice that just by their placement on the page, he aligns the sixteenth notes, particularly ones in groups of three, such that the reader can observe explicit differences in contour. The number of times each melody is played is shown to the right.

After showing the patterns, Quinn explains the shortcomings in contour theories at his disposal. The next step was to find a suitable way to measure these contours. Before considering potential contours as members within **M**, there must be an algorithm that works with the members already in **M**. To create a suitable algorithm, Quinn considers four different approaches, which I have summarized in Figure 4.12. The first approach, using the contour segment class or "cseg-class," measures the contour membership by how they are presented.

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[252] I want to thank Ian Quinn for granting me permission to use and reproduce examples, tables, and figures from his 1997 article from *Music Theory Spectrum*.

Figure 4.11 Quinn's contour family **M**.

Example 1. The sixteen melodies (collectively called **M**) played by the first violins and flutes in Reich, *The Desert Music*, iii (outer portions)

The second approach measures the contour membership in their prime form, which, per Robert Morris's theory of contour, reduces the contours to their highest, lowest, first, and last notes (some of which can be mutually inclusive).[253] These two approaches contain two algorithms each: A_1–A_2 and A_3–A_4. The first algorithms from the two approaches, A_1 and A_3, admits potential contours that share the same qualities (cseg-class and prime form) with *all* members of **M**. By contrast, A_2 and A_4 admits potential contours that share the same qualities with only *one* member of **M**. Regardless, all four algorithms are not suited for Quinn's needs.

Moving from the second to third approach, Quinn switches from measuring equivalency to measuring similarity. Though not as rigid, there is enough analytical rigor to create suitable comparisons. The third approach measures the cseg similarity between different contours. As Quinn notes, however, the results are too broad in A_5 even when compared to any and all members of **M**. Finally, Quinn switches from comparing individual measurements to each other to comparing individual measurements against an average. The result is a suitable algorithm, A_6, that compares contours with the average contour of **M**. In sum, Quinn's answer to adapting the current research into suitable algorithmic representations, the difficulty of which he deems "the judgment problem," required changing his comparative parameter from equivalency to similarity.[254] Specifically, the similarity parameter is measured against an average rather than any one member.

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[253] Robert Morris, "New Directions in the Theory and Analysis of Musical Contour," *Music Theory Spectrum* 15/2 (1993), 205–28.
[254] Quinn 1997, 236.

Figure 4.12 Summary of Quinn's algorithms.

Approach	Algorithm	Admission	Suitable?
1 entire contours	A_1	Admit contours into **M** with same contour segment class (cseg-class)	No: none of the contours already in **M** share a cseg-class
	A_2	Admit contours into **M** that share a cseg-class with one of the members of **M**	No: assumes that current **M** members are not bound by **M**, but current new members are
2 contour reduction	A_3	Admit members with the same prime as those in **M** and (provisionally) those with same depth	No: not all of the contours reduce to the same prime
	A_4	Admit members with same prime and depth with one of the members of **M**	No: "allows too many contours that clearly do not belong" (Quinn 1997, 238)
3 cseg similarity	A_5	Admit members with a high degree of similarity to members in **M**; with threshold of undetermined judgment	No: widely varied results among **M** contours
4 fuzziness	A_6	Admit members showing sufficient resemblance to the average contour of **M** via CSIM	Yes: the average of the contours, a contour in itself, will be a fuzzy contour grounded in fuzzy sets

With a suitable algorithm created, Quinn discusses how fuzzy set theory will fit with the theory of contour. Fuzzy theory accounts for how different situations potentially require different amounts of generality, and therefore different possibilities can emerge. To find a suitable comparison with fuzzy theory considered, Quinn presents multiple ordered pairs represented in the traditional Cartesian model: (x,y), S x S, ASIM(t,u), and so forth.[255] From this, he is able to create a way to measure degrees of membership using fuzzy sets against ordered, or "crisp" sets. Any result from these measurements is interpreted as a level of confidence. For example, comparing x to y and getting a reading of 0.56, means that there is a 56 percent level of confidence that x belongs to y. Quinn explains, "When used as uncertain entities, and not imprecise ones, fuzzy sets provide a firm and precise foundation for any formal system, no less so than crisp sets."[256]

With the fuzzy groundwork laid, Quinn turns his attention toward creating the comparison between different contours. This includes a 1:1 comparison as well as to the average. Because contour is the compositional feature of interest, he broadly divides the relations into ascending and descending, represented as "C$^+$" and "C$^-$," respectively.[257] Quinn's Table 3, reproduced as Figure 4.13, shows membership of two entities (p,q) in crisp and fuzzy terms.[258]

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[255] The algorithms, theorems, and equations that Quinn cites are beyond the scope for my purposes, which is to summarize the concepts. For a detailed overview, see Quinn 1997, 241–47.

[256] Ibid., 248.

[257] Ibid.

[258] N.B. the dot to the left of the number 1 in the fuzzy membership (p,q) column seems to be a printing artifact and has nothing to do with what is provided in the table.

Figure 4.13 Quinn's table quantifying crisp and fuzzy membership into C+.

Table 3. The three contour relations expressed in crisp and fuzzy terms

	Crisp membership in C^+		Fuzzy membership in C^+		COM
	(p,q)	(q,p)	$\mu_{C^+}(p,q)$	$\mu_{C^+}(q,p)$	$\mu_{C^+}(p,q) - \mu_{C^+}(q,p)$
	$(p,q) \notin C^+$	$(q,p) \in C^+$	0	1	+1
	$(p,q) \in C^+$	$(q,p) \notin C^+$	-1	0	-1
	$(p,q) \notin C^+$	$(q,p) \notin C^+$	0	0	0

Finally, Quinn adapts Elizabeth West Marvin's contour similarity function "CSIM" to create an equation that compares similarities between the ascent relations of two entities, named "C+SIM."[259] He tests this equation by comparing 32,768 (2^{15}) generated, eleven-note contours against the average **M** contour. With the minimum threshold set to 0.70, only 17 contours are suitable enough for membership into **M** (only two if the threshold is 0.72). Thus, following an incredible amount of deduction, Quinn has found a way to measure confidence of membership not just from current members within **M**, but potential ones.

In his final observation, he states that his fuzzy algorithm "proves to be a remarkable simulation of a person thinking in music."[260] This calls back his initial assertion of relating contour with "activities of composition, perception, cognition, and analysis."[261] Accompanying this observation are two graphs by Quinn in Figures 4.14 and 4.15, which show two generated models of listeners and the degrees of confidence in identifying family resemblances of the melodic patterns, plus their repetitions, in each occurrence as well as the accumulated patterns that came previously.[262] The first graph maps the patterns in full and the second graph maps a reductive, five-note "subcontour" found in each pattern. By using a simulated, generative model, Quinn provides quantitative representations of confidence.

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[259] Ibid., 257. Cf. Elizabeth West Marvin, "A Generalized Theory of Musical Contour: Its Application to Melodic and Rhythmic Analysis of Non-Tonal Music and its Perceptual and Pedagogical Implications," PhD diss., University of Rochester (1988).
[260] Quinn 1997, 258.
[261] Ibid., 232.
[262] Errata to note in both graphs: following m_5 should be m_{6a-c}, m_{7a-b}, and m_{8a-c}.

Figure 4.14 Quinn's generated graph of the listener's confidence (given contours).
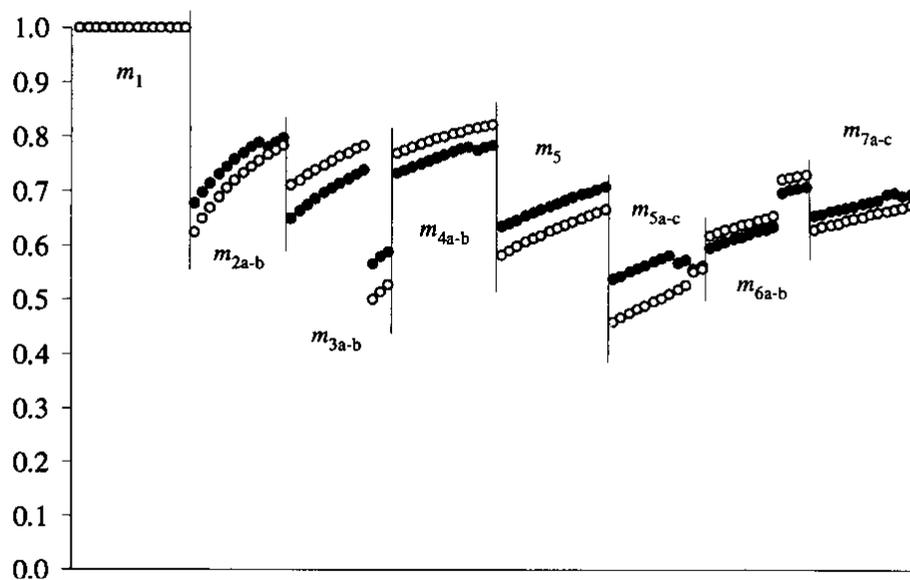
Figure 4.15 Quinn's generated graph of the listener's confidence (subcontours).
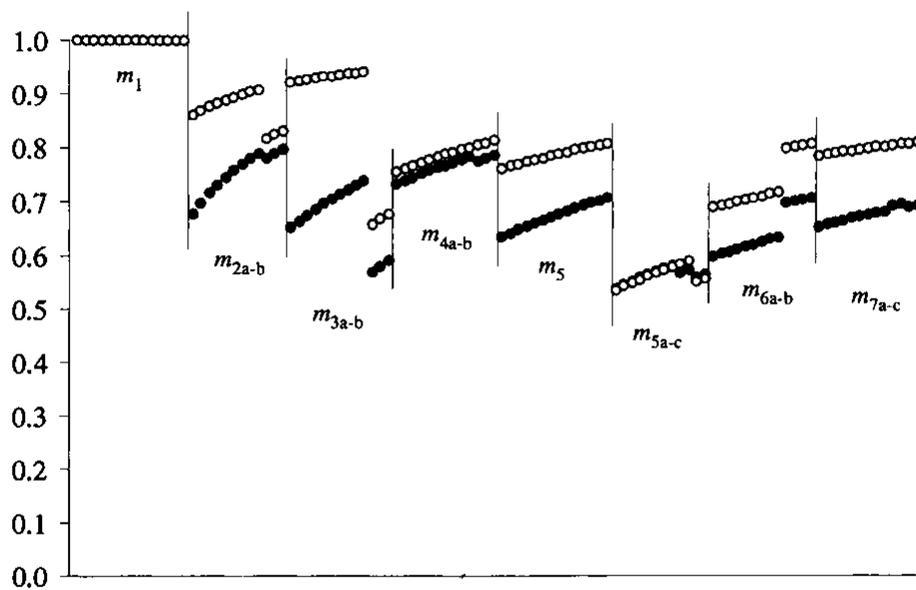
4.5.2 Analyzing Quinn

In Ian Quinn's analysis of *The Desert Music*, one can observe the machinations of developing a suitable analysis.[263] First, Quinn presents the theory of contour as his choice in methodology. He details the parameters of contour by grounding it in Robert Morris's set theory and thus allowing it to focus on general types. The parameters in question, Quinn notes, are the "sequential dimensions," which include time, pitch, duration, loudness, timbre, and chord density.[264] Based on the sixteen melodic patterns, Quinn establishes a foundational family of contours labeled **M**. However, the literature on contour theory at the time was not suitable for the musical work in question, explaining that, had he proceeded with using just the literature, the results for inclusion into **M** would be "impossible at worst, and uncomfortable at best."[265]

Therefore, to find the suitable means to create membership in **M**, Quinn sought to adjust the current literature with an outside topic: fuzzy set theory. He asserts that fuzzy set theory will be useful "in modeling and understanding certain ways of thinking in music, especially kinds of thought for which the music-theoretical tools at our disposal were never intended."[266] I find that analyses bringing in outside concepts are more likely to yield novel ways to think about the music at hand. In this case, as is the main meta-analytical premise to Quinn, fuzzy set theory allows the reader and, by extension, the

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[263] In a later article, Quinn further details the suitability of his formalist analysis of *The Desert Music* in the context of analyzing minimalist music. See Ian Quinn, "Minimal Challenges: Process Music and the Uses of Formalist Analysis," *Contemporary Music Review* 25/3 (2006), 283–94.

[264] Quinn 1997, 232. The original passage lists these dimensions as I have but ends by citing timbre again. Either this is in error or Quinn wanted to emphasize it.

[265] Ibid., 233.

[266] Ibid.

listener, to consider different possibilities and potentialities when conceptualizing the work. Quinn elaborates:

> To put it simply, the membership function is an expression of the confidence we may have in saying that some object is a member of some set. This confidence may derive from probability, but it does not have to. Most fuzzy theorists would say that it comes from *possibility* instead. But what is most important for the present discussion is to understand that when we are dealing with a fuzzy entity, such as a fuzzy contour, it is not imprecise, but rather uncertain.[267]

Precision can still be the endgame so long as the certainty or uncertainty is properly mitigated. Speculating on possibility can mitigate the uncertainty with a properly developed theory and approach. Thus, speculating on the compositional activity with an approach inviting possibilities can still yield precise results without them being absolute in nature.

Quinn's analysis does have shortcomings. The most prominent one is the amount of abstraction away from the music itself. What is also not considered in the degrees of confidence in the contour membership is the variability of change once repetition is factored in. This is somewhat addressed in the final generative graphs, but not as rigorously as one would hope. In her recent article on fuzzy melodic contours, Kristen Wallentinsen addresses this by expanding the scope of Quinn's analysis to include how repetition affects levels of confidence in identifying members in the same areas of Reich's work. Further, she considers how different types of build-ups against the melodic pattern (for example, the clarinet against the flute, which I will discuss later) affects the levels of confidence.[268]

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[267] Ibid., 247, emphasis in original.
[268] Kristen Wallentinsen, "Fuzzy Family Ties: New Methods for Measuring Familial Similarity between Contours of Variable Cardinality," *Journal of Music Theory* 66/1 (2022), 93–128.

Along with adding to Quinn's analysis with her own rigorous contour model, Wallentinsen's approach to *The Desert Music* is primarily grounded in possibility. Specifically, when considering "emergent melodic possibilities" from Reich's composite patterns, she applies the phenomenon of multistability when qualifying possibilities.[269] Multistability is a concept that concerns the ambiguity an object can possess such that multiple interpretations of the object are not only possible, but also simultaneously interchangeable at any moment. An example of this is the famous "rabbit/duck" illusion. This results in the subject perceiving a multistable object as one concrete interpretation while, at the same time, also considering the potential for another equally valid interpretation.

Wallentinsen discusses multistability in further detail, including levels of perception towards a multistable object.[270] However, I want to focus on multistability's idea of multiple, intersubjective interpretations found in *The Desert Music*. To help aid in understanding the possibilities, I will apply the concept of trace melodies and the palimpsest metaphor from Philip Duker's article on *Drumming*, discussed in my previous analysis of the same work.[271] The passages containing Quinn's **M** contours, henceforth "melodic patterns," will serve as the formal areas of interest. In these areas, I will demonstrate that how an ever-changing texture creates overlapping layers, especially at moments of transition, that potentially allow the listening subject to create multiple interpretations.

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[269] Ibid., 95.
[270] Ibid., 116–19.
[271] Philip Duker, "Resulting Patterns, Palimpsests, and 'Pointing Out' the Role of the Listener in Reich's *Drumming*," *Perspectives of New Music* 51/2 (2013), 141–91.

4.5.2.1 Formal attributes of the melodic pattern

Every one of Quinn's contours in *The Desert Music* has a similar layout that neither he nor Wallentinsen fully detail in their analyses of the work. Example 4.6 shows melodic pattern m_1 shortly after its initial presentation in R120. There are two melodic patterns present in this excerpt: m_1 in the Flute/Violin I parts and another melodic pattern in the Clarinet/Violin II parts. Both patterns are accompanied with their own respective t_1 and t_2 transpositions.[272] In R121, Reich presents fragments of m_1 in parts 2 and 3 of Flute/Violin I. It may suggest the beginning of two build-up patterns. However, the next measure to add onsets, located at R122, presents the patterns in their entirety. Another way to interpret R121's repetition in the context of the potential build-up pattern is as such: mm. 1–2 repeat once (mm. 3–4) and is directly followed by the complete pattern in R122. Even in postminimalist music, as is evident in *New York Counterpoint*, the build-up technique is still used, albeit updated, but there is never an instance of one build-up measure that moves directly to the full pattern. Therefore, in R121 and every equivalent location with an **M** contour, Parts 2 and 3 in Flute and Violin I do not employ the build-up pattern. They simply present a two-measure fragmented pattern, repeat the fragment once, and then play the full pattern at their respective transpositions.

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[272] Part 3 in Flute/Violin I has a slight difference in its beginning figure. Instead of a B♭–G–E♭–C, it is E♭–G–B♭–C.

Example 4.6 Steve Reich, *The Desert Music*, R121–R122 m. 4.

Perhaps this "fragment-to-full" technique is used because *The Desert Music*'s melodic patterns are two measures long, and this way of introducing the transpositions is Reich's solution to maintaining momentum in the music without spending too much time on each pattern in such a large work. This is especially pertinent given that there are sixteen melodic patterns in this movement. Just as I track the patterns in *Drumming* to show areas of resulting patterns, Figure 4.16 shows formal attributes for the sixteen melodic patterns found in the third movement of *The Desert Music*.

Figure 4.16 Steve Reich, *The Desert Music*, III (outer sections), pattern form chart.

Pattern	Entrance	Repeat pattern?	Frag.-to-full?
m_1	R120 R117	1x	R121 R118+R119
m_{2a}	R126	No	R127
m_{2b}	R129	2x	No
m_{3a}	R130	1x	R131
m_{3b}	R133	2x	No
m_{4a}	R134	No	R134 m. 3*
m_{4b}	R137	2x	No
m_5	R212	1x	R213
m_{6a}	R218	No	R219
m_{6b}	R223	1x	No
m_{6c}	R224	1x	No
m_{7a}	R225	1x	R226
m_{7b}	R230	3x	No
m_{8a}	R232	No	R233*
m_{8b}	R237	1x	No
m_{8c}	R238	1x	No

* Additional two measures in the fragment-to-full technique

Figure 4.16 shows three attributes pertaining to the primary and secondary melodic patterns and their form. The entrance shows the location where each two-measure pattern is first presented. Both the primary and secondary patterns enter at the same time save for m_1, where the secondary pattern enters earlier. In fact, it is the first pattern to enter in the third movement. Some of the patterns are repeated either once or twice, making the initial presentation of those patterns four or six measures long, respectively. Following the entrance plus potential repeat, the patterns may use the fragment-to-full technique in Parts 2 and 3 of the instrument groupings. This technique is typically four measures in length (i.e., two iterations of the same fragment). If they do not use this technique, then Parts 2 and 3 will enter with their full, transposed patterns with their respective Part 1's at the entrance.

As mentioned above, melodic pattern 1 is the only one where Clarinet/Violin II's entrance is separate from Flute/Violin I's.[273] Further, Part 2 of Clarinet/Violin II has its own R-measure area (R118) to use the fragment-to-full technique separate from Part 3 (R119). This explains why the secondary pattern and its transpositions are already playing in full in Example 4.6. Otherwise, both of the grouped pairs will enter at the same time, and Parts 2 and 3 will employ the fragment-to-full technique together. Only the "first" of each melodic pattern (1, 2a, 3a, 4a, 5, 6a, 7a, and 8a) will use the fragment-to-full technique. Any subsidiary patterns (2b, 3b, 4b, 6b, 6c, 7b, 8b, and 8c) will move to the next pattern. Furthermore, patterns 4a and 8a, the final patterns of the outside sections in this movement, have an additional two measures in their use of the fragment-to-full

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[273] I will forego the use of *m* and subscript labels for the melodic patterns in favour of their numbers and letters, where applicable, as it is more concise.

technique. In these two extra measures, pattern 4a's fragment measures have material in both measures and 8a contains only the latter half of the fragment (i.e., material on the second of the two measures), followed by material in both measures. Example 4.7 shows an excerpt of 8a starting where the fragment-to-full technique is used. This half of the fragment can be interpreted as a lead-in to the fragment in R233 m. 3.

Regarding the repetition, the even numbered, "first" patterns (2a, 4a, 6a, and 8a) do not repeat their melodic pattern. They only play the melodic pattern once and then introduce fragments. This could be to consolidate the lengths between odd and even numbered patterns. Although there are fewer odd numbered patterns (including subsidiaries) their R-measure-spans from the fragmentation-to-full progression to the next pattern are typically longer (e.g., R121–R126 for 1; R131–133 for 3a; R213–R218 for 5; R226–R230 for 7a). Again, the subsidiary patterns do not have any fragmentation. The first section's subsidiary patterns (2b, 3b, 4b) repeat their patterns twice and go straight to the next pattern. The second section's subsidiary patterns (6b, 6c, 8b, 8c) repeat their patterns once save for 7b, which repeats its pattern three times. In sum, Quinn's groupings in **M** not only show similarities in contour membership, but they also show significant formal attributes with regards to the patterns and their development.

Example 4.7 Steve Reich, *The Desert Music*, R233–R234 m. 2.

4.5.2.2 Palimpsests in melodic patterns

In his article on *Drumming*, Philip Duker equates resulting patterns played with composite patterns to a palimpsest, a manuscript page that has evidence of previous writing that has been erased to make room for newer writing. The idea behind the musical application of a palimpsest is that for every new pattern played, traces of previous patterns can still linger. Duker elaborates on its application to resulting patterns in *Drumming*:

> Each time a new resulting pattern emerges from the surface, it will inscribe once more upon the palimpsest that is the composite texture. With each new melody, either following previous traces or creating alternative possibilities, what might be considered a static background is reframed and nuanced.[274]

The third movement of *The Desert Music* does not contain any resulting patterns and thus the composite patterns from the texture will not contain the same type of palimpsest that Duker identifies. However, with a focus on the development of the patterns themselves and the ongoing progression of the patterns throughout the movement, there is a chance to create alternative possibilities that Duker states (i.e., melodic palimpsests) and, as previously mentioned by Wallentinsen, creating multistable interpretations of the patterns themselves.

Like many of the works analyzed in this dissertation, the pattern is arguably the most significant attribute. In *The Desert Music*, the sixteen melodic patterns share attributes in their initial presentations, their repetitions, and their textural development. Quinn and Wallentinsen have covered the significance behind the contours of these patterns in great detail. As shown in Figures 4.14 and 4.15, Quinn managed to generate

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[274] Duker 2013, 169.

two models of listening that track a (virtual) listener's confidence in remembering the

melodic patterns over time and their relation to other patterns.[275] Rather than considering

the full retention of past patterns and their respective iterations, it would be more fitting

to conceive of the transitional blending between two adjacent patterns. This creates the

possibility of a listening subject inferring a melodic palimpsest, where the new pattern

has traces of the previous pattern.

The idea of this palimpsest is further motivated by the similarity between adjacent

patterns. In the context of contour, Wallentinsen presents a degree of "best fit" when

comparing the relationship of familial membership values in preceding contours.[276]

According to Wallentinsen, comparing the contours of adjacent melodic patterns,

including their t_1 and t_2 transpositions, yields quantitative data resulting in a "conceptual

apparatus necessary to fully understand the potential relationships between the melodies

themselves."[277] Using patterns 7b and 8a as an example, she suggests adjacent melodies

with high degrees of "best fit" mean that Reich is able to "mask the particular

differences" between them.[278] Therefore, in the context of a palimpsest, the higher degree

of "best fit" means the more likely the listener can identify traces from a previous pattern

when attending to the current pattern.

Because Reich likes to compose with continuous movement prioritized, the best

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[275] Although presented as confidence in retaining the contour and the family resemblances of **M**, it seems more prudent to conceive of the object in question as the pattern rather than one of its qualities (contour).

[276] Wallentinsen 2022, 107. For the full best-fit quantitative results of the patterns discussed, see Kristen Wallentinsen, "Fuzzy Family Ties: Familial Similarity Between Melodic Contours of Different Cardinalities," PhD diss., University of Western Ontario (2017), 239–41.

[277] Wallentinsen 2022, 123.

[278] Ibid., 122.

way that a listener can be attentive towards works like *The Desert Music* that creates

multiple interpretations is to focus on the patterns in relation to their previous pattern.

This has the benefit of still engaging with the music in real time without being too

retroactive (e.g., trying to relate pattern 4b to pattern 1). The listener can also engage with

the two current patterns (plus transpositions) found in the two instrumental groupings as

well as with the preceding parts.

4.5.2.3 Any sign of gesture?

As I inquired in my *New York Counterpoint* analysis, is there any gestural activity

in this movement of which to speak? There is an initial hesitancy to answer in the

affirmative because, unlike *Drumming*, the melodic palimpsests found in the composite

patterns of *The Desert Music* are not indexed by a resulting pattern that emphasizes

rhythms derived from the composite patterns. Furthermore, using this fragment-to-full

technique rather than the build-up technique shows that Reich wants little development to

happen in favour of continuously progressing through the sixteen different patterns in this

movement.

However, the listener can infer significance behind the patterns in the form of

melodic palimpsests between adjacent patterns. Their salience plus the degree of

similarity (Wallentinsen's best fit) means that the listener can be aware of the pattern

changes occurring in real time as well as identify melodic traces of what came before.

Because the palimpsest signifies the pattern development, we can qualify its

representation through signs.[279] Specifically, because of its recurrence in every area

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[279] Refer to Chapter 1 for an overview of Charles Sanders Peirce's nine signs from his three trichotomies.

where one pattern moves to the next, the palimpsest would be a sinsign, a singularity or a token of a type, because it represents the potential moments in which the listener can identify melodic traces. If it is regarded as conventional (a legisign), then one should expect to infer the same palimpsest every time it potentially occurs. Furthermore, due to this potentiality, the palimpsest is also a rheme. We do not view this inference of identifying melodic traces as a factual guarantee that it will happen (dicent), nor that it is supposed to conventionally happen (argument). In other words, the palimpsest does not just occur, but recurs, yet the recurrence is only possible when conceiving of it as a potentiality and not a guarantee. Lastly, the sign in Peirce's second trichotomy to describe this melodic palimpsest would still be the index. It indicates a potential combination of what is there and what has come before.

If the listener can conceptualize the moments of change paired with the fragments from what preceded, then perhaps a gesture can be inferred. This interpretant, though, will come in many subjective forms. However, that is the point of how these patterns are treated in *The Desert Music*: from their continuous progression emerges multiple interpretive possibilities. Thus, understanding the difference between the direction of the palimpsest (indexing) and the direction of the music (continuous progression) yields signification inviting multiple valid interpretations.

4.5.3 Closing

Quinn's perceptual judgments of the structure in *The Desert Music* consists of a selection of melodic patterns with a specific focus on their contour. Renegotiating these judgments shows the ongoing compositional evolution of how Reich treats the pattern. Instead of a build-up, there are more salient events of fragmented versions of the patterns

at eighth-note transpositions which accompany their main pattern. Combine this with the progression between adjacent patterns, as Wallentinsen discusses, and there is the potential for trace melodies in the form of palimpsests to occur. Such palimpsests can yield potential gestural activity in a compositional format containing a streamlined technique that foregoes build-up in favour of a more salient form of development.

4.6 Conclusion

The significance of Reich's minimalist technique cannot be fully expressed through instances of symbolic gesture. Due to the conventional practices Reich created from his stylistic period, many of his postminimalist works shared several compositional attributes. Discussion only at the level of gesture could not merit sufficient analytical rigor in these intricate works. Turning to what has already been said by other theorists shows areas of both agreement and disagreement. Just as the symbol operates on an implicit understanding of convention, so too does analysis. Renegotiating Roeder's and Quinn's analyses towards a more referential perspective shows how the compositional and analytical elements in the minimalist style are more refined in the minimalist technique.

The potential gestures emerging from the two analytical renegotiations are reminiscent of what was found in the minimalist style. Again, regardless of the conventional attributes found in Reich's postminimalist music, the gestures still operate according to their simpler derived forms found in the stylistic works. However, because of the shared attributes, understanding the compositional techniques in one of Reich's postminimalist works has the potential to create equivalent understandings across

multiple works. For example, my findings in *New York Counterpoint* can be transferred to *Electric Counterpoint*.

One might be inclined to retroactively apply the analytical findings in the postminimalist music to Reich's previous stylistic works. Both eras share similar compositional devices, notably Reich's continued use of the build-up pattern. *Drumming* would be a good candidate to explore intrastream accents, for example. However, though pitched percussion instruments are used, "rhythmic canons" are favoured over "pitched counterpoint." Furthermore, with Roeder's analysis focused primarily on the accent, it is possible for one to conflate the analytical accent with a performative one. One trait that still remains in Reich's postminimalist music is rhythmic ambiguity, which is achieved through even attacks. The points of emphasis that help the listener group the patterns together is done outside of the work. Identifying these points is an act of interpretation— as Roeder sets out to do, the accents are the result of analysis. As we have seen in this chapter, understanding these analytical symbols helps the interpreter, be it analyst, reader, or both, infer signification within these works.

Chapter 5

Conclusion and Further Research

Along with uncovering underlying significations, the methodologies and analyses presented to this point in this dissertation sought to provide better understanding into Reich's music as a whole. Because of how his compositional practice evolved, the works I covered from three consecutive decades (1960s, 1970s, 1980s) can be roughly divided into three periods of music with their own distinctive attributes. Beginning with process music, Reich's initial experimental practices introduced a new compositional ontology where form informed content and vice versa. With the help of non-Western influences, his stylistic works moved away from experimentation in favour of works with more formally articulate structures. Finally, his postminimalist music codified much of the stylistic practices, where many works shared equivalent compositional attributes. In this concluding chapter, I discuss how my analytical pursuits have led to a better understanding of the music from these three periods, how my analyses significantly contribute to current music-theoretical scholarship, and further possible avenues that can be explored.

5.1 Recap

In Chapter 1, I expressed a preliminary concern regarding the oversaturation of formalist analyses in past minimalist music scholarship. Thus, a referential approach provided a different means to represent Reich's music. Specifically, reference to the music would be done through a theory of musical gesture grounded in Peircean semiotics. The semiotic approach to music was primarily modeled after Naomi Cumming's approach from her book *The Sonic Self*. My approach to gesture was primarily derived

from scholarship by Cumming, Robert Hatten, and David Lidov. This combination of gesture and semiotics allowed me to seek meaning in Reich's works and consequently provide a better understanding of his compositional activity.

In Chapter 2, I discussed how Reich's process music combined form and content to create works that sonically exhibited a chosen musical process. Previous scholarship conflated process music with musical process: the latter consists of objective qualities that can be found in any work and the former is the work itself. In other words, musical process is objective, whereas process music is subjective. A listening subject that is attentive to the musical process has the potential to create subjective interpretations of Reich's process works.

This chapter focused on how process music, fitting into Timothy Johnson's conception of minimalist aesthetic, was signified by the sonic qualities of musical process.[280] Because the musical process and the sounding music are one and the same, these sonic qualities exhibited a likeness to process itself. Thus, the gestures created, or, the musical interpretations made by the attentive listener, show how the sounds exhibit an iconic likeness to its object, the musical process.

The gestures in phase-as-process works, which I detail in my analysis of *Melodica*, are reliant upon the differentiation between moments of phase and pattern. The composite pattern was further explored through its imagistic and temporal gestalt representations. The temporal gestalt, which concerns events of mediation, allows for multiple interpretations of the same pattern to be equally valid. Further, the

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[280] Timothy A. Johnson, "Minimalism: Aesthetic, Style, or Technique?," *The Musical Quarterly* 78/4 (1994), 745.

interpretations were dependent upon the listening subject's understanding of process music. Citing the First Law of Mentat from the science fiction novel *Dune*, I explained that a listening subject who moves to the flow of the musical process is attentive to the process.[281]

Sonic qualities were further explored in my analyses of Reich's augmentation-as-process works, *Pendulum Music* and *Four Organs*. As Reich discusses in his essay, "Music as a Gradual Process," the musical process of augmentation is equivalent to pulling back a swing, releasing, and watching it come to rest.[282] In *Pendulum Music*, the augmentation was literal: the sounds, motivated by the physical forces of gravity and inertia, represent the augmentation process. These forces acted as the performative agents of the process's realization. In *Four Organs*, the augmentation was metaphorical: Steve Larson's musical forces allowed gravity and inertia to be recognized as the same type of representation and thus paralleling the process in *Pendulum Music*. This parallel was represented in *Four Organs* through several animations of a pendulum that followed the development of the work from its preparation of the augmentation and the augmentation itself.

In Chapter 3, I discussed Reich's works from the 1970s that followed his process music. In line with Johnson's conception of minimalist style, these works exhibited more articulate and salient forms in which change and, subsequently, completion was determined primarily by texture. Rhythmically, the pattern remained the focal point and

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[281] Frank Herbert, *Dune* (Philadelphia, Chilton Book, Co. 1965) [Reprint: London: Penguin Books Ltd., 1987], 50.
[282] Steve Reich, *Writings on Music: 1965–2000*, edited by Paul Hillier (New York: Oxford University Press, 2002), 34.

was further motivated by the study and exposure to West African drumming. The other notable element added from West African drumming to Reich's performance practice was even attacks, creating rhythmic ambiguity and, through layers of different unaccented patterns, virtually eliminating any sense of metric hierarchy.

The stylistic works' formal development was possible through two distinct uses of the pattern. First, the build-up pattern, which substitutes rests with beats, allowed Reich to systematically add parts from a texture primarily consisting of a composite pattern and, depending on the work, an underlying pulse. Second, the resulting pattern allowed a performer (i.e., a separate part) to emphasize a pattern within a composite pattern without using accents. The resulting pattern is either made explicit by Reich in the score or chosen by the performer. With the composite pattern as the semiotic object, build-up and resulting patterns represent two kinds of indications made in performance. In other words, build-up and resulting patterns indexed the composite patterns as the work developed. This indexing articulated the composite pattern (object) which further directed a listening subject towards the composite pattern. Such indexing subsequently has the potential to create musical gestures.

Gestures made possible through a build-up pattern were explored in my analysis of *Music for Pieces of Wood*. The work follows the development of a pattern in sections of six, four, and three beats. Of the five Clave parts, three of them are responsible for adding to an ever-growing composite pattern in each section with their own distinct build-up patterns. I assert that these build-up patterns do not start as patterns, but as rhythms. It is not until they reach the point where the build-up contains at least four onsets for a listening subject to designate it as its own entity. The build-up pattern as a

rhythm still relies upon the structure of the composite pattern before it becomes independent. Thus, the distinction between rhythm and pattern is fundamental to the build-up pattern's indexing of the composite pattern. Furthermore, Lidov's textural repetition helped explain how the composite pattern's repetition affects the quality of the build-up pattern and its subsequent indexing. This "passive" indexing directed the listener to the build-up pattern, but the gestural index from the build-up pattern directed the listener to the derivative composite pattern. The latter, "active" indexing, where the gesture is inferred, allowed the listener to change the rhythmic placement of either the build-up pattern or the composite pattern given which one the listener prioritized. In other words, the listener could determine which of the patterns informed their listening of the other pattern and vice versa.

Gestures from resulting patterns were explored in my analysis of *Drumming*, where I discussed two main aspects attributed to their signification. First, the choice between Reich's manuscript-style *Multiples* score and the more conventional *Boosey & Hawkes* score showed two different performative representations. The former represented *Drumming* at a macro level which only marked changes, when necessary (e.g., build-up, phasing, removal), and the latter writes out every measure of the work, save for areas of repetition. The choice in score affects the choice in resulting pattern, which in turn affects the type of gesture communicated by the performer. Second, resulting patterns can potentially leave traces of previous material (i.e., rhythms, melodies). This subsequently directs (indexes) a listening subject's attention toward current material in the context of (still-present) previous material.

Reich's postminimalist works were discussed in Chapter 4. In line with Johnson's

conception of minimalist technique, these works saw a codification of materials such that formal, melodic, and harmonic aspects are shared across multiple works. In Peircean semiotics, symbols represent their objects by means of conventional relations. Due to this stipulation, symbolic gestures are more difficult to qualify musically. One exception is found in the beginning of several of Reich's postminimalist works, where sonorities are repeated to dynamically swell in order to achieve the same effect as one breathing. This "breath gesture" can be considered symbolic because of its use across several works. They not only serve as a means to introduce the harmonic sonorities, but also formally act as introductory material.

Because there was no other significant material to be considered as symbolic gestures, this chapter shifted to inferring signification by discussing two formalist analyses, which serve as their own respective symbolic representations of the music. John Roeder's approach to rhythmic activity and Quinn's fuzzy application to musical contour highlighted two important points found in a good analysis, respectively: analyses are built upon codified syntax and invite possibility.[283] The remainder of the chapter focused on the discussion of these points through a referential perspective of the analyses and its impact on the gestural interpretation of Reich's works discussed. Furthermore, because postminimalist works refined the techniques used in the stylistic works, considerations from analyses of the latter were applicable to the former.

Deriving from a harmonic syntax, Roeder's analysis sought to formally map three of Reich's works using beat-class modes, tonics, and modulation as well as a series of

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[283] Ian Quinn, "Fuzzy Extensions to the Theory of Contour," *Music Theory Spectrum* 19/2 (1997), 232–65. John Roeder, Beat-Class Modulation in Steve Reich's Music," *Music Theory Spectrum* 25/2 (2003), 275–304.

accents that qualify onsets within both a composite pattern and a build-up pattern. While focusing mainly on *New York Counterpoint*, my method of renegotiating Roeder's analysis towards a referential perspective considered how textural repetition affected the intrastream accents and the changes in rhythmic modality. I concluded that the gestures in *New York Counterpoint* can be found in the equivalent location of previous stylistic works using the build-up technique. Though the technique is streamlined in Reich's postminimalist music, the potential gestures (i.e., the interactions between the build-up and composite pattern) would still be considered indexical.

Next, Quinn's analysis used material from the third movement of *The Desert Music* to create a new theory of contour that measured fuzzy sets for inclusion into a designated grouping. The sixteen contours selected from Reich's work that made up the grouping **M** were combined to create an average contour, which was a contour in itself. The main consideration for inclusion into this **M** average for a potential contour was not an absolute fit for membership, but a degree of confidence in being considered a member of **M**. My renegotiation focused on this potentiality and possibility, broadening the scope to consider the patterns used rather than strictly focusing on their respective contours. Mapping out the formal locations of each pattern led me to consider areas of transition because they showed a high degree of potential as areas of signification. Combining Kristen Wallentinsen's "best fit" measurements of the same patterns with Philip Duker's palimpsest metaphor from his analysis of *Drumming* showed that areas of transition potentially created a unique form of indexing where moments of change can direct the attention of the listening subject.

5.2 Implications and Contributions

Each chapter focused on a different subject that engages with the music. For Chapter 2, the listening subject was of analytical interest. Outlining a type of subjective engagement into Reich's music affected how the listener will infer signification. Subjective engagement was a crucial element to my analyses, and its impact should not be limited to this dissertation. Furthermore, Chapter 2 relied upon extra-musical metaphors to better explain the works and convey the signification. For example, my pendulum metaphor in *Four Organs*, which created the parallel to *Pendulum Music*, was meant to equate Reich's swing metaphor with process. Creating analytical considerations outside the score can yield just as rigorous results in one's interpretation of the music. This also applies to the analytical representation. There was no other practical way to show my *Four Organs* pendulum metaphor other than through animations.

Chapter 3's analytical subject of interest was the performer. Performance practice and performative representation impacts how one will approach the works in questions. The gestural interpretations in this chapter were impacted by what and how the music was presented by the performer. Knowing that even attacks lead to rhythmic ambiguity was a crucial element in understanding Reich's stylistic works and was thus a crucial element in my analyses. Conclusions made in this chapter were only possible through a solid foundation of understanding, the underlying goal to the entire dissertation.

Chapter 4 directed its attention toward the analytical subject. The meta-theoretical approaches aimed to renegotiate the boundaries between contrasting methodologies. There is as much analytical rigor in one reconsidering an existing piece of scholarship as there is in creating novel approaches, and there is even the possibility of novel

approaches emerging from such reconsiderations. Though my gestural endeavors came up short due to the restrictions placed on the work with the methodology, going deeper into explaining how gesture can be expressed was done through my renegotiations. Taking that extra step, which could be considered another layer of mediation, allowed me to reach conclusions motivated by outside scholarship as well as my own.

5.3 Future Research

There are two observations one might have noticed in this dissertation which will be topics for discussion in my future research. First, much of the dissertation was about establishing a framework for better understanding Reich's music. The analyses discussed more about how the analytical subject infers gesture more than it discussed the qualities of the gestures themselves. Some gestures were metaphorically associated with something else, including the animated pendulum and the melodic palimpsest. Other than that, there was little discussion on the expressive content in the gesture. One avenue of future research is making use of existing labels, such as the application of Rebecca Leydon's minimalist tropes to the gestures emerging from my analyses.[284] As noted in Chapter 2, to support my argument I found it prudent to establish how the gesture emerges—which, in itself, has analytical value—before turning my attention toward the qualities of the gesture.

The second observation is that this dissertation primarily focused on Reich's "absolute" or non-programmatic works. This was also intentional so as to keep a narrow scope and allow for the interpretations made to be applied to his programmatic works.

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[284] Rebecca Leydon, "Towards a Typology of Minimalist Tropes," *Music Theory Online* 8/4 (2002)

For example, with Cumming as the central scholar of my analytical framework, there was no mention of her formidable article on *Different Trains* save for in a footnote in Chapter 1.[285] An impasse in framing my postminimalist chapter led me to forego discussion of gesture, narrative, and psychoanalysis in Reich's programmatic work in favour of focusing on only gesture in two previous formal analyses.[286]

There is the potential to expand the limits of gestural analysis in the works of other minimalist composers. For example, exploring the effects of a listening subject adopting Pauline Oliveros's "deep listening" opens an interesting avenue in approaching her music, especially within the context of musical gesture. One who adopts such a listening practice broadens their attention not just to the music itself, but also to their own environment. Thus, considerations of a listening subject's own representation of the sound can go beyond the work itself.

Another possible avenue to expand upon musical gesture in minimalist music is its presence in works that include a visual medium, including film, television, and opera. One who is interested in gestural activity could potentially analyze emerging signification (e.g., musical gesture) in a composer's original score or a work used in film and television. Though Reich did not compose for any of these mediums, his works such as *The Cave* (1990–93), *Three Tales* (2002), and *Reich/Richter* (2018) combine music with

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[285] Naomi Cumming, "The Horrors of Identification: Reich's 'Different Trains,'" *Perspectives of New Music* 35/1 (1997), 129–52.

[286] Patrick Milian's article, which elaborates upon Cumming's article, uses a Peircean semiotic approach to discuss further meaning in the work. Patrick Milian, "Art/Artifact: Semiotics of Music, Language, and Sound in *Different Trains*," *Pacific Coast Philology* 54/1 (2019), 38–55.

some sort of visual medium.[287] Further, Reich's music has been used in film and television. Along with Reich, this can extend to composers like Philip Glass, John Adams, Arvo Pärt, among others.[288]

Yet another avenue for future research is to adapt or combine the findings of gestural signification in Reich's works with other analytical considerations. As an example, using gesture to explain aspects of narrativity and/or psychoanalysis can further expand a work's reference to other extra-musical considerations. This further provides the potential to transition from my discussion of the musical work and the reader to the performer and listener, as shown in Mariusz Kozak's real-time referential approach. Along with his article on *Violin Phase* and dance, applying concepts like lived time, affordance, and enactment can certainly be considered for future analytical endeavors.[289]

With these potential avenues combined with what I have discussed, I hope this dissertation has shown ways to approach Reich's music that are not strictly or entirely dependent upon objective analysis. Speculating on subjectivity, signification, and gestural inference in Reich's music has yielded what I consider to be fascinating results which, just as part of a larger genre of fascinating music, has shown to be open to analysis rather than resistant to it.

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[287] Though it does not strictly focus on gesture, Sean Atkinson's article on meaning in Reich's *Three Tales*, along with his postminimalist work *Tehillim*, is an existing analytical example which examines the extra-musical meaning behind Reich's use of augmentation as a technique. See Sean Atkinson, "Canons, Augmentations, and Their Meaning in Two Works by Steve Reich," *Music Theory Online* 17/1 (2011).

[288] Yayoi Uno Everett, "'Counting Down' Time: Musical Topics in John Adams' *Doctor Atomic*," in *Musical Semiotics: A Network of Significations*, edited by Esti Sheinberg (Burlington: Ashgate Publishing, 2012), 263–74, is an example that examines signification in John Adams's opera.

[289] Mariusz Kozak, "Anne Teresa De Keersmaeker's *Violin Phase* and the Experience of Time, or Why Does Process Music Work?," *Music Theory Online* 27/2 (2021).

Appendix A: Compositions Cited

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Curriculum Vitae

Name: Martin Ross

Post-secondary   University of Nebraska-Lincoln
Education and   Lincoln, Nebraska, USA
Degrees: 2009–2013 B.M.

                        University of Massachusetts Amherst
                        Amherst, Massachusetts, USA
                        2013–2015 M.M.

                        University of Western Ontario
                        London, Ontario, Canada
                        2015–2022 Ph.D.

Honours and   Western University Graduate Student Teaching Assistant Award
Awards: 2017, 2018

Related Work   Teaching Assistant
Experience: University of Massachusetts Amherst
                        2013–2015

                        Teaching Assistant
                        University of Western Ontario
                        2015–2022

                        Lecturer of Music Theory
                        University of Western Ontario
                        2022–2023

Publications: Ross, Martin. "Pointing Towards a Narrative: Gestural Patterns in
                        Steve Reich's *Music for Pieces of Wood*." In *Music and
                        its Narrative Potential: About the Narrativity of Music and of
                        Music as a Distinct Part of an Intermedial Art Work*, edited by
                        Bart Bouckaert, Ann Peeters, and Carolien Van Nerom. Leiden,
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