Theater Without Organs: Co-Articulating Gesture and Substrate in Responsive Environments

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Ludwig Wittgenstein’s skepticism about the expressive scope of propositional language, Jacques Derrida’s critique of logocentrism, generalized via semiotics to all forms of representation, and Judith Butler’s analysis of the performativity of gender motivate the turn to performance as an alternative to representation. In this essay I discuss a genre of responsive environments in which computationally augmented tangible media respond to the improvised gesture and activity of their inhabitants. I propose that these responsive environments constitute an apparatus for experimentally investigating questions significant for both performance research and philosophical inquiry. The responsive environments were designed as sites for phenomenological experiments about interaction and response, agency, and intention under three conditions: (1) the participants are physically co-present, (2) each inhabitant is both actor and spectator, (3) language is bracketed.

The last condition does not deny language, but focuses attention on how an event unfolds without appealing solely to textual or verbal communication. As such, these environments constitute performative spaces whose media – sound, visual field, acoustics and lighting, objects and furnishings – can be reproducibly conditioned, and in which actions can be rehearsed or improvised. I will describe the apparatus of these performative spaces in enough detail to be able to address certain phenomenological questions about the continuum of intentional and accidental gesture in the dynamical substrate of calligraphic media: continuous fields of video and sound or other computationally animated materials, continuously modulated by gesture or movement. I suggest that emerging forms of calligraphic media present an alternative to linguistic pattern for the articulation of affectively charged events, practically and theoretically interrogating the status of narrative in the construction of theatrical events.

What symbolically, affectively charges an event? When movement matters, how and why does a gesture make meaning? If we provisionally bracket verbal narrative and invite non-experts to improvise movements that nuance time-based media in a common performative space, then how can we condition a physical environment to sustain experiences that are as compelling as the works of Bertolt Brecht, Heiner Müller, Jerzy Grotowski, Eugenio Barba, Robert Wilson, Pina Bausch, or Anne Teresa Keersmaeker? We ask these questions in the methodological silence left by Antonin Artaud’s call to liberate theater from the tyranny of the text, from what he called dramatic literature. In what sense, and to what degree this is possible may be questioned, because, as Derrida argued in his essay on Artaud, “Presence, in order to be presence and self-presence, has always and already begun to represent itself.”\(^1\)
Notwithstanding Derrida’s sly reversal re-establishing the primacy of grammatological representation, there have been diverse practical responses to Artaud’s challenge over the past half century in experimental theater. Art collectives (Dumb Type, sponge, Palindrome, Chunky Move) are beginning to use computational media technologies in a less remediated and more idiomatic ways. Although there is much to be said for cargo cult approaches to technology, nonetheless one need not take the technology of electronic devices, protocols and software for granted as naturalized, shrink-wrapped black-boxes. Conducting this material, embodied craft with some technical discipline affords some grip for critical and artistic experiment. At the same time, one remains acutely conscious of the epistemic frames constructed and imposed by techno-scientific practice, a task which becomes more challenging the more deeply we enter the black-box, adapting insider knowledge and practices from techno-scientific research and development.

Over the past 15 years, my work with these responsive environments has been guided by the demands of performance research, particularly questions concerning the phenomenology of performance. One of my key experimental motivations is to explore how we could make possible a compelling experience without relying on pre-scripted, linguistically codable, narrative structure. More precisely, I pose three questions:

(1) How can people coordinate transformative and compelling experiences without relying on conventional linguistic categories such as verbal narrative? The technical analogue to this is: how can people create sense together in a responsive media environment (henceforth “responsive environment”) without resorting to grammatical structures? This may seem like a purely technical concern but it has extensive ethical-aesthetic implications. For example, this impels us to seek alternatives to procedural, “if-then” logic and to the locally linear syntax of time-based scripts and scores, including patterns found in conventional genres of interactive art and fiction. One expects that the materials, whether patterned by logic, social field, or physics, make a difference to the event.\(^2\)

(2) How could people improvise meaningful gestures collectively or singly in an environment that is as dynamic as they are, an environment that itself evolves over time as a function of its inhabitant life? Interaction modeled on a particularly reduced notion of computationally mediated action and response is a far cry from densely varying textures of theater or everyday life. How can expressive gestures be sustained in sensate and animate matter, some of which may be animated computationally?
(3) How could objects emerge continuously under the continuous action of inhabitants in a responsive space? This question of novelty itself comes from a larger critique of technology, understood as that which mediates the co-construction of human subjects and our world. Given the thick, pre-analytic, pre-orthogonalized aspect of the lifeworld with its nuanced fields of relation and influence, one may ask of technology a rich but not more complicated life. But instead of restricting ourselves to observation, given a studio-laboratory we can experimentally design and inhabit our own events, too. This risks complicating and contaminating the event according to the conventions of theater as well as laboratory science. However, that word risk itself implies a purity of the event, independent of acts of observation, which we may expressly question. Humberto Maturana and Francisco Varela observed that a continuously self-reproducing autopoietic system cannot draw an objective distinction or operational boundary between exterior and interior stimuli. As Maturana and Varela were generalizing from nervous systems and cellular organisms, it seems that their observation should pertain to any autopoietic system, of which our responsive environments were designed to exemplify. Therefore the event’s creators and players are by design and in practice themselves participant-observers of their responsive play spaces.

The significance of these three questions about compelling non-verbal play, improvised meaningful gesture, and the emergence of objects from fields is not confined to theater or experimental performance alone. They are not merely technical problems solved by the artist plying his or her craft. I believe that reflecting closely on the practices and technologies of performance conversely provides insight about gesture, agency and materiality. Having written also about the relation between gesture, agency and materiality elsewhere so let me make two critical comments here about the consequences of these relations for gesture in a responsive environment.

Given an environment made with tangible, responsive media, we can begin to understand experimentally how gesture conjures the self and how collective gesture conjures the social without assuming schemas of gesture, selves and the social prior to the event. One of the original principal motivating themes for the installation-events and the associated research described in this essay is the dissolution and re-formation of bodies in a continuous field. When this field is a social field, then the act of gesturing becomes a way to shape intentional being in the world from a state of non-intentional
distraction. At a larger scale, since our gesture is conditioned by birth, habit, and culture, gesture entangles social history with the body in action. Not only our own personal histories but also the habits of generations sediment into our own bodies as disciplines that fluidly scaffold our gestural expectations, anticipations and intentions. The technology of performance allows us to play tangibly and reproducibly with such processes of individuation.

Accordingly, we study how people could improvise gestures meaningfully in a media-rich space that evolves continuously in response to their activity. With the “media choreography” systems realized by the Topological Media Lab which I established in 2001 to pursue such research and creation, we have built frameworks of pliant software instruments that enforce no syntax on the player’s expressive gesture. By relaxing syntactic constraints, there are no wrong movements and every movement “does something” to modulate the ambient environment. In place of syntax and grammar, we have a responsive environment that tangibly resonates people’s gestures and movement with one another and the environment: every glide, every stroke, every slip and slide, stirs media processes in tandem with the physical material world. In a deep sense, one can claim that is the ontological continuity of the field of superposed media processes that enables improvisation and performatively rich nuance.

This continuity has strong phenomenological consequences. Continuity is a leitmotiv of topological media and the heuristic lens into the full, thick dynamics of our embodied experience. As you sweep your arm it moves continuously through the air. As you walk to your friend to greet her, your consciousness has no gaps. In everyday experience, your existence appears to have no gaps. As human experience is dense and continuous our creations should sustain playfully intensified experiences that, in my terms, are not complicated but rich.

Since we composers of responsive environments wanted to sustain such phenomenal density in our own play space, we made software media engines that synthesize time-based video and audio. These engines, especially the sound instruments, allow players to dissolve, re-constitute, and shape perceptual entities under the impact of their individual and collective activity. Making a media engine that evolves continuously also radically reduces the complexity of the media elements that need to be assembled for production because media can be synthesized afresh in response to the activity during an event. In practice, we pre-fabricate relatively few media objects (i.e. video or sound files) as initial textural material to seed the processes that re-synthesized dynamic fields of sound and image in real-time performance.
What is the medium of gesture in this extended dynamical setting but continuous and open material, that is a topological medium? We use topological media not as an abstract model, but as the substrate of performance and physical action itself, an expressive tissue amalgamated from gesturing flesh and re-synthesized video and sound. Where Grotowski challenged actors to use their own bodies as their expressive medium, in studio-laboratory work I take as my challenge creating computationally mediated matter for expressive presentation.
Analytic sciences and philosophy may be less attuned to this non-representational use of matter because matter, whether ink and paper or fabric, has tended to be regarded as part of dumb nature, the object of mere craft (not art). Literary theory and till recently cultural studies may gain analytic purchase on matter only so far as it can be traced as linguistically signifying matter. Matter, topologically construed and topologically constituted, may serve as the substrate of poetic expression. (For a more adequate introduction to what one might mean by topology and topological media, please refer to [Sha 2012, 2013].)

I sometimes characterize the empirical practice of the Topological Media Lab as a form of materials science. Adopting the more modest spirit of making a textile rather than a jacket, one can ask what would play the role of the “textile” opposite to the “performance-event”? It would have to be the hybrid media, the hybrid, dynamical, responsive fields out of which particular narrative objects and event sequences emerge. I call these fields the substrate. The Ozone media choreography system as architected, constitutes not a particular event action sequence like a stage play or a game, nor even a generalized language, but the substrate to a continuous range of performance. I should emphasize that I do not wish to use substrate in its ordinary sense of being prior or more foundational than its objects or events, but in the sense of the physics of fields. The substrate is constitutive of the objects and events that form in it; in other words, the substrate and its contingent objects occupy the same ontological stratum. So, objects do not emerge out of the substrate, objects emerge in it. The substrate is in the same ontological stratum as its dynamically forming and dissolving objects. What this offers performance is an alchemical technology for poetic matter. Such technologies of, for example, gesturally nuanced realtime video and sound synthesis, and of responsive, sensate and luminous electronic fabrics comprise contemporary amplifications of the technologies not of representation but of performance.

The Ouija Experiments

The Ouija media and movement experiments were motivated by questions that I posed to a colleague and choreographer: Michael Montanaro, Chair of Contemporary Dance at Concordia University. When is a movement accidental, and when volitional? And when can a set of movement be construed as a collective movement? Leaving aside such questions as, when is a gesture a citation of another gesture, such questions are
not easy even for a human to discern about another human. The very multiplicity of the world makes such questions, in a sense, undecidable, and yet, the significant expansion of pattern recognition research and industry testifies to an enduring fascination with this question in the technologies of security as well as the technologies of performance. Michael Montanaro responded with a series movement exercises that could be carried out in a theater-scale blackbox by dancers. After six months of preparing appropriate responsive sound and video instruments, a team of realtime media artist-programmers worked with an assistant choreographer and various combinations of dancers in daily structured improvisational exercises and theatrical or choreographic experiments. It is important to note that this was a long durational work in studio, not a performance with an audience beyond a proscenium.

Interestingly, these studies were simultaneously legible to the dancers as a dance exercises like structured improvisation, and to theoretical eyes as philosophical experiments. The media artist-programmers were asked to accompany the movement artists in five ways: by filling the 16m x 16m x 8m high black box theater with canned (pre-edited, linear) sound or video, or sound or video that responded to movement, or no media but work lights. The artists and experimentalists wanted to see how responsive media could palpably vary the experience and the concerted movement of the dancers. In one memorable experiment, after the dancers had some hours to familiarize themselves in a contact improvisation exercise, they were asked to work in pairs. One member of each pair was blindfolded and the other passed her hand over the partner, close enough for the first to sense the hand without touching. They were asked to try to, in essence, continue contact improvisation without contact. Interestingly, one blindfolded dancer, a man, kept trying to reach out after the sighted, “active” dancer. From the way he craned his head about, he seemed to be trying to visualize where his partner was located in space. But it took much longer for him to entrain with his partner that way the other pairs entrained: after about 20-30 minutes, the pairs of dancers initiated and terminated non-parallel movement with extraordinary synchrony. This particular exercise was performed in silence. In another experiment, the dancers wore wrist-born, wireless accelerometers mapping the forces of their movements to sound. As an aside, such sensors measure not physical displacement or speed, but force.

So, if a body moves at a steady pace along a straight line (to first approxima-
tion), the sensor reports zero plus residual noise. If the body moves along a curved path at the same steady pace, however, the sensor will report a force, the centripetal force due to the arc. This confuses those who cognitively model the “accelerometer” as measuring speed. In any case, despite such subtleties in the remapping of movement, when the radio connection died because the batteries ran out on their wrist sensor, the dancers could tell immediately that the Max/MSP process synthesizing the rich, dynamically varying sound was no longer coupled to what they were doing. Indeed, the wearer could tell this when the lapse is not apparent to observers. Clearly, the ever-varying sound fields coupled with physical action intimately modulated the first-person experience in ways palpably distinct from what a third party could observe. This “malfunction” validated the focus of this work, which was first-person, or better, first-hand experience.

In yet another exercise, the realtime video artist-programmers projected onto the wall life-size shadows of the dancers. In fact, each dancer multiplied into three bodies: their own, a physical shadow cast by theater lights onto the large (17m x 8m high) white wall, and a second copy of their own bodies delayed by video processing an adjustable number of milliseconds. Every single pixel of the video could be delayed by a different amount time, and the delays could be changed over time from milliseconds to many minutes, in response to movement in countless variety. There was an opportunity to explore many subtle phenomena. For example, when you stand in front of a mirror and hold up your hand. Your mirror self holds up his corresponding hand.13 This is your (reflected) image with zero (perceived) delay. You see this as yourself. But if the image of you is displayed with a long delay, say many seconds, then you see this as someone else, not yourself now, but a copy of yourself, then. Therefore, something subtle must happen with some intermediate temporal delays. In what time intervals of delays do these subtle reversals or flickerings of self and not-self happen? This informs phenomenological questions that the experimentalists wanted to explore. However, the dancers chose the simplest possible case, a uniform delay of about 6 whole seconds.14 This turned the eye-filling wall into a membrane that duplicated their actions and replayed them back on the wall over a considerable gap in performance and experiential time. Referencing capoeira martial art technique, the choreographer and the dancers came up with a way to have dancers work with and against the delayed copies of themselves in a mesmerizing counterpoint of bodies,
their shadows and their delayed images. But this raises a question of how movement artists incorporate technique: after seeing the profound and mesmerizing effect of a wall in which every single pixel could be delayed independently of the others, why did the choreographer ask for a wall with a uniform delay, the simplest effect? Observing their work, it seemed that the uniformly delayed “mirror” wall allowed the dancers to deposit whole bodies in complex action with one another. This reminds one of Whitehead’s comment, in Process and Reality, that a “young man does not initiate his, experience by dancing with impressions of sensation, and then proceed to conjecture a partner. His experience takes the converse route.” However interesting this sociotechnical phenomenon may be, a more subtle thing happened as we all were enchanted by the obvious appeal of dancers fighting rhythmically with six-second old copies of themselves. Sensing the potential of these movement sequences for a performance, one sensed strongly a shift in collective intent, from opening up corporeal investigations and experiential questions, to a narrowing of the sequences down to a single sequence practiced repeatedly for a putative audience. In other words, the collective activity changed from experiment to rehearsal.

From “What is the Human?” to “Where is Human?” and “How To Human?”

By this point, it may be apparent that the sort of responsive environments that we have built constitute apparatuses for an experimental exploration of subjectivation, in Guattari’s sense. In order to conduct this exploration in the mode of experimental performance research, we focus our attention on the amplification of metaphorical gestures by co-present humans performing in a common responsive, alchemical medium. In order to query or re-fashion the fold between nature and artifice, signs and matter, ego and other, I have wagered that we must create (as we have) a responsive medium as a continuous amalgam of the forms of matter that are accessible to our craft, whether computational or physical: projected light, organized sound and video, fabric, choreographed flesh, speech, software. What we must and have set aside are certain categories such as the cogito as well as the body because in order to understand such ontological or phenomenological categories it greatly helps to transgress those categories’ boundaries rather than assume them a priori. More intrinsically, it is also inconsistent to reject Western Cartesianism and
dualism, but in the same breath make theater on the tropes of cognitive science, or computational and behaviorist flavors of neuroscience.

But how could we bracket the body phenomenologically, and what are the consequences of such a bracketing? To bracket the body is not to deny or to hide it but in fact to pay attention to its framing condition. In general I find it helpful to imagine the world not as a vacuum raisined with corpuscles but as a plenum of varying density. With such a field-based approach, the body then becomes a local density whose boundary is implicitly and provisionally defined by contingent anticipation or imagination and by the expectations formed in the course of contingent performance.\textsuperscript{17} Of course it follows that these densities and boundaries vary over time, from moment to moment, and from disposition to disposition. A set of pedestrians’ or dancers’ limbs moving in tandem could form a body, as could a group of voices momentarily syncopated. What we ought not assume however is an invariant deterministic mapping from physiological data to metaphor. Although an invariant mapping may be a necessary working notion for neurologists and linguists and engineers, we need not and should not as poets, or as phenomenological experimentalists assume a discernable deterministic relation between physiological data like heartbeat, galvanic skin response, or breathing rate, and macroscopic objects of performance like emotion, mood, or narrative entity.

Pragmatically, what we learn from neurophysiology and the principled scientific study of neural phenomena is that the data are simply too complex and polyvalent to plausibly map to any simple linguistic token of an emotion or some human behavioral state. A smile could correlate with amusement, embarrassment, confusion or the rictus of death. A spike in the nervous signal of a muscle could correlate with an equally great variety of putative “causes.” But beyond such pragmatic concerns, there is a more fundamental conceptual issue. Such a mapping would be merely a trace of the physical other, which is not identical, and may have only accidental relation to the embodied phenomenal experience, or, to borrow from Varela, Rosch and Thompson, embodied enactive experience. It is true that an artist may intentionally impose a mapping, but the art of a responsive environment lies in the fashioning of a substrate, not any particular object in a particular event.

But to unmoor (lift anchor from) bodily preconceptions and to free the actors’ flesh from pre-designed “mappings” of cause and effect, a responsive environment should provide extra modalities of flesh in addition to the
ordinary flesh of the performer-player: for now, the modalities of gesturally modulated light, sound, and fabric. If you move, your skin shrugs over the bones of your hand not in a dialogic response to your action, but as the locus of intentional imagination fused with the physics of muscle and bone. In the same way, we create our calligraphic video, sound and fabric not as pre-carved masks or prosthetic devices, but as expressive tissue that can be charged and recharged with latent, potential responsivities to gesture and movement. Continuity of media and body, whether effected by techniques of camouflage and projection or by haptics and sensors and active cloth, leaves open the boundary of the performing body in the way that helps us as experimentalists in performance research to explore just such bracketings of the body.

Now, having suspended the body in this sense, what if we bracket the cogito as well? What if we bracket not only the cogito but also the ethico-aesthetic and desiring Subject? Deferring presumptions and models allows us to see how subjectivities emerge under the dynamics of co-present play and to see what becomes of agency. As designers of responsive play spaces we can ask, where should we locate the causal agency of a human-machine system? The Ozone media choreography system, the gesture sensing and media re-synthesis system that produces the responsive sound and video with behaviors that evolve in the course of play, enables designers to distribute agency in a much more fine-grained way through the different components of the media architecture, but it evolves with agency of the human players as well. Indeed, this challenges media composers who must relinquish total control of their media logic to unanticipated responses of human visitors, yet the composer must design evolutionary logics yielding experiences that feel more engaging than accidental pastiche. In my view, one condition for an aesthetically compelling experience in a responsive environment is that it should not induce puzzle-solving behavior. I wish the inhabitants of a space to never have to think about how everything works. This cognitive response has become almost inevitable among experienced consumers of interactive games because that is how we have come to expect to play with a machine. But puzzle-solving is a poor substitute for theater or any thick form of life. More fundamentally, puzzle-solving ferociously re-inscribes only cognitive acts, and a particularly reduced set of such acts at that.

In sum, a responsive environment can be a performative space in which people can playfully improvise gestures to collectively or individually create
meaningful patterns out of fields of dynamically varying light sound, fabric and bodies. The media synthesis processes develop continuously according to a field-theoretic, magic physics without propositional logic, schema, or symbolic computation. The media fluidly evolve according to autonomous processes as well as and in response to the players’ activities. The continuous shaping of the responsive media follows definite, composed metaphorical topographies that give a characteristic potential to the experience in a particular aesthetic, performative event. One might say that the potential dynamics created by the composers of a particular responsive installation-event are a collective social gesture eliciting a collective response from the ambient social ecology, not a specific set of calls and responses à la Disney imagineering, but rather a topological substrate of latent, potential response, the stuff of the imaginary.

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Footnotes

2. For a fuller development, see Sha Xin Wei, Poiesis, Enchantment, and Topological Matter, MIT Press, 2013.
3. Complexity has often been valorized as yielding phenomena emerging from large collections of discrete entities in networks of relations modeled on graphs, phenomena that one does not observe in an individual entity. However, I maintain that complexity does not equal richness, just as panoply of choice does not equal freedom (as anyone encountering the bewildering array of differently processed coffee beans in equally tasteless combinations of flavors could attest). Indeed complexity inevitably tends to overwhelm sense and value. On the other hand, if we believe that human experience is continuous, dense and rich but not combinatorially complex, then it should be a healthy challenge to try to make our performance technologies themselves topological rather than combinatorial. (Sha Xin Wei, Poiesis and Enchantment in Topological Matter, MIT 2013.)
6. For a thorough and technically precise description of an approach to conditioning a rich, responsive, computational media environment via topological continuous (not discrete) dynamics, see: Sha Xin Wei, Michael

7. The exploration of that continuous ontology is a joint investigation with Niklas Damiris. See forthcoming book: Sha Xin Wei, Poiesis, Enchantment, and Topological Media.

8. See the discussion of gesture as an open relation in Sha, “Resistance is Fertile”.

9. I thank Helga Wild for the formulation of presentation vs. representation.

10. Naturalizing matter as dumb substance parallels what Bruno Latour identified as sociologists’ tendency to naturalize scientific objects. (We Have Never Been Modern (Cambridge, Mass.: Harvard University Press, 1993)) More than ten years later, science studies has largely responded to Latour’s call for the symmetrical disposition towards social objects and natural objects, but this symmetrization is still slowly percolating into neighboring domains in cultural and literary studies and philosophy.

In a sense, the discussion of gesture recalls the discussion of the nature of light and vision prior to relativity theory. Prior arguments about the existence or non-existence of ether as a medium which conducted light were subsumed by arguably Einstein’s deepest insight, the equivalence of geometry (in the sense of geometrodynamics) with the distribution of matter-energy. In geometrodynamics, the material medium is also the geometry of space, so that a signal, being the rarefaction and compression of physical matter, is simultaneously a time-varying informatic fluctuation as well as a material fluctuation.

11. In some ways, substrate is a suggestive concept for what Deleuze and Guattari described by a-signifying BWO – Bodies Without Organs. (I am indebted to Arkady Plotnisky for clarifying this notion’s relation to BWO.) An emergence can be seen either as a change in intensity to use Deleuze’s concept of change, differentiation vs. differenciation – or as a concrescence, to use Whitehead’s process ontology.


16. It may help to compare this with the modern investigation of intelligence. The Enlightenment’s formation coincided with a fascination with the boundaries of the human represented by such quasi-objects as Wolfgang von Kempelen’s chess-playing automaton of 1770 (Tom Standage, The Mechanical Turk (London: Allen Lane, 2002).

17. In fact, it is in this sense that I interpret Deleuze and Guattari’s Body Without Organs. See note 9.
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Thomas Richards, At Work with Jerzy Grotowski on Physical Action.
TGarden, http://www.topologicalmedialab.net/xinwei/sponge.org/projects/m3_tg_intro.html
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