

Meaning as Response: Experience, Behavior, and Interactive Environment Design

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Harry Smoak

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By: Harry Smoak

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Signed by the final examining committee:

Chair

Dr. David Howes

External Examiner

Dr. Thomas Lamarre

External to Program

Dr. Lynn Hughes

Examiner

Dr. Sha Xin Wei

Examiner

Dr. Erin Manning

Thesis Supervisor

Dr. Christopher Salter

Approved by

Chair of Department or Graduate Program Director

Dean of Faculty

ABSTRACT

Meaning as Response: Experience, Behavior, and Interactive Environment Design

Harry Smoak, Ph.D.

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This thesis proposes a novel theory of *meaning-as-response* inspired by the pragmatist and cultural historian Morse Peckham (1914-1993) and presented for consideration of specifically how artistic behavior can make an immediate difference for affecting technical culture and innovating technical practices. Throughout, the author draws on his own extensive experience and practice of making computational responsive environments conceived of as material experiments for the generation of new forms of thought and feeling. An introduction to Peckham's original thought is supplied as an entry point for practitioners and theorists alike who are unfamiliar with the most crucial work of this significant "ecological" thinker of the arts. Next, selected aspects of Peckham's thorough-going behavioral aesthetics are discussed and analyzed in order to contextualize his most important ideas along with their historical and intellectual connections. A primer of Peckham's "language" of signs is included as supplemental aid for those working along Peckhamian lines. Continuing from the notion of a learning process, next consideration of presuppositions relevant for ongoing practice is taken up. Attention is given in particular to important relevancies during early stages of learning something new or for the first time—from initial interest, to selection and development of working materials, to preparation for wanted further competencies. This research aims to revive interest in this provocative thinker by placing it in a new setting, thereby contributing a fresh angle to recent critical debates on agency, materiality, and embodiment in contemporary art and technology practices. Proposed are strategies that implicate the interests of artist-researchers themselves and bear on efforts to take experimental work outside the insulated spaces of university studio-labs and galleries to put it in connection with a wider array of day-to-day activities. This thesis is concerned with a single problem, namely the possibility of a genuinely new idea emerging from within practice. The relevancy of this problem lies in the fundamental importance of the possibility for all makers, in every place and every time. The question asked is: How can a philosophy of "experience" be applied to the practice and reflection of art-as-research?

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Chapter I

Experience without a Subject

Imagine, if you will, that you recently received an invitation to an unusual improvisatory performance event at a local university. According to the linked Google Maps directions, you are to proceed to a modern office tower located in a downtown quarter of the large metropolitan city where you live. The complex had recently been heavily touted as part of a successful university-wide development campaign, at the heart of which was the idea of fostering engagement between art and technology and the city's cultural sector. Further included details indicate the performance is hosted by a resident studio-lab involved in the research and design of digital environments and related technologies. Your friend—a young local photographer and member of the mobile digital literati set who originally forwarded you the invitation—had called the event a public experiment. On the way to your agreed-on rendezvous, you pass from the subway through a complex network of tunnels lined with small shops and restaurants with entrances to underground shopping malls, hotels and office buildings that are all connected. Getting there is easy, with or without your online maps, and without ever leaving the modern underground city. You guess you are getting close, gauging by the technical equipment and artworks on prominent display in the corridor. Just then your friend messages to let you know she's close by. Just ahead, a different set of architectural cues suggests an entranceway to some sort of performance space. A greeter can be seen handing out program information to a few others who have also just arrived. You take a flyer from the student attendant and head inside.

On the other side, you are immediately thrown into a confused landscape. You nearly trip

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over cables strewn across the floor as you take in the ceiling height and large room proportions, theatrical lights, banks of loudspeakers and other professional audiovisual equipment. It occurs to you that you might have walked in on a film production or a television studio of some sort. Nearby, clustered around portable computers, specialized equipment, and another mass of cables is a small group of technicians. Occasionally one of them gestures toward a small video camera suspended overhead. Unusual sounds can be heard over the hubbub together with other sounds that are recognizable as chopping, cutting, and shredding. At times the admixture seems almost musical. Overall the atmosphere is friendly, not austere or complicated. In the midst of it all, a chef appears to be preparing to cook a meal. The sounds you hear seem to be generated in real time as he interacts spontaneously with various physical objects and utensils on his worktable. From his stylized gestures you gather he must be a movement artist or some sort of mad conductor. The very air seems alive to his every gesture. At times the distinction between the chef, his implements, and the audio/visual environment is less clear. It is as if the augmented table, objects, knives, foodstuffs are not his instruments, but rather are performing him. Displayed behind him on an outsized projection screen is a high definition montage of colorful foodstuffs, out-scaled kitchen equipment, and computer generated effects. Gradually the effects coalesce in a performance that could be described as a small concert. Just then, a familiar face appears from across the room, signaling for you to join her.

The opening narrative above is meant in part to evoke the atmosphere of an encounter with a twenty-first century studio-lab working toward the realization of an idea of a responsive environment. I have in mind here an interactive computing environment in which the overall structure in which “users” (usually human) and computational programs operate is brought about in a kind of reciprocal action in response to dynamic changes of an overall situation. I want to know what groups of makers are doing in situations like the one indicated at the outset, and in analogous but different situations as well. What’s more, I want to understand the way in which nascent technologies (e.g., wireless sensors) affect the process of development. Indeed, an important proposal of this thesis is that configurations of human-machine-environment are more fruitfully understood as joint actions of doing something, that is, as a form of collective action.¹

First, some nomenclature is in order. The term *studio-lab* originates from Michael Century’s

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widely influential 1999 Rockefeller report (prepared initially for the Canadian and North American cultural industry) where he used it to indicate a new form of “hybrid innovative institution, the studio laboratory [or, simply, studio-lab], where new media technologies are designed and developed in co-evolution with their creative application.”² A *responsive environment* nominally indicates a basic configuration of humans, non-human computational machines, and environment and their overall dynamics, which I will say more about in a moment. A studio-lab nominally indicates a group of practicing students and artist-researchers—*makers*—who are considered to be working creatively alongside the development of innovative media technologies (namely computer software/hardware frameworks) and engaged principally in activities of university research, the outcomes of which may be presented as authored public performance-events, artifacts suitable for exhibition, or publishable papers.³

Century held that the manifestation of such arrangements is a sign of an overall transformation in the mode of production of knowledge having taken place in and broadly informing the latter half of the twentieth century.⁴ In the humanities and social sciences, as well as the fine arts, a number of art-and-technology-specific proposals have been introduced by major university funding agencies in the years since Century’s report, suggesting an early investment by the institutions to bridge to early and later stage developments of the knowledge economy as suggested by his analysis.⁵

In contrast to Century’s interpretation, recently Georgina Born and Andrew Barry have called for more attention to be given to the specificity, heterogeneity and complex genealogies of so-called *art-science*.⁶ Art-science is a term sometimes used in the policy discourse of the US, UK, Australia, and some parts of Europe whereas the work of artists explicitly engaged with science and/or technology in institutional contexts is more usually known as *research-creation* in Canada and Quebec.⁷ Born and Barry take aim at operative assumptions informing current policy and shaping strategic directions taken (for example, the appeal to public funding agencies for mainly what art-science can do for science). The authors have drawn on significant ethnographic research in a push to take notice of the “diversity of forms of interdisciplinarity,” each instance exemplifying what they describe as an “experiment” namely for the creation of new publics.⁸

I bring up these broad institutional concerns initially to point out that there is a variety of responses and approaches to questions of knowledge production in relationship to creative technical

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work. I mention it also so that beginning makers might begin to see themselves entangled in what is a difficult situation. The other reason is so that makers thereby may begin to recognize a means to make the problem their own. It is not, after all, a question of whether any particular “experiment” is finally what is needed. Indeed, I think we need a great number and many different kinds of experiments.

Ethnographic accounts such as those offered by Born and Barry surely play a crucial intermediary role in helping to ascertain original cases by collecting essential descriptive detail of , conduced preliminary analysis, and providing initial concepts. Even more, what is desired is a way to read across many different kinds of experiments in order to extract from each its most worthwhile lesson, namely the *difference that makes a difference*.⁹

For widespread understanding of human-machine-environment configurations as a form of joint action, more needs to be said to the effect of “doing something” in regards to the making of particular instances of, for example, responsive environments. First, though, what is a responsive environment? The term itself is often credited to the American computer scientist Myron Krueger, a pioneer of interactive computing and forerunner in what today is more widely known outside of computer science circles as augmented/mixed reality and interactive computer art. In computer science, interaction has been frequently conceived as a two-way dialogue between a computer software program and a human user. In an early review of his research presented at the National Computer Conference and published in 1977, Krueger writes:

I was dissatisfied with such a restricted dialogue [afforded by predominant interfaces available at the time, such as the keyboard and the data tablet] and embarked on research exploring more interesting ways for men [sic] and machines to relate. The result was the concept of a responsive environment in which a computer perceives the actions of those who enter and responds intelligently through complex visual and auditory displays.¹⁰

In discussion of an early project GLOWFLOW (1969), Krueger illuminated a key factor contributing to this surprising development. Krueger worked on this project together with colleagues from the computer science and sculpture departments at the University of Wisconsin. As he de-

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scribed it, visitors entered a darkened room in which initially only dimly glowing lines of light were visible. Four horizontal rows of transparent tubes lined the wall together with vertical columns, each connected to a pump for circulating a solution containing phosphorescent pigments. As visitors moved through the room they immediately observed a changing light and soundscape.

What they could not directly perceive were the differences in electrical potential yielded by their stepping on pressure-sensitive floor pads located at the base of the columns, changes that were detectable (as voltage) by a connected computer. The computer was also connected to controllable lights hidden within the columns through which the tubes passed. Using the changing voltage as a control signal, the computer could turn the lights either on (sufficient to physically excite the pigments) or off. The visible result was the glowing effect. Visitors were not immediately aware of the hidden relationship between their movement and what they saw (and heard, as the computer also controlled sound), as additional delays were intentionally introduced by the artists. The reason given for this step was that “the artists’ attitude toward the capacity for response was ambivalent.”¹¹

Krueger is explicit: It was the uncertain experience of that early project that first led him to make up his mind to explore the conditions of *interactivity* to the exclusion of artwork that just happens to be interactive. Prior to his early involvement, Krueger may have had a personal interest in the arts, although comments made in this paper and elsewhere suggest he was not very familiar with its theory or history. Certainly he was not interested in traditional aesthetic or material concerns as applied to the computer as an object either; indeed, he clearly states his only concern was the “quality of the interaction.”¹² Krueger’s assertion “Response is the medium!”¹³ seems as audacious today as it probably did then. *Medium*, as he defines it, is “comprised of sensing, display, and control systems [that] accepts inputs from or about the participant [presumably human] and then outputs in a way that he can recognize as corresponding to his behavior.”¹⁴

Throughout the 1970s and 1980s, Krueger continued to seek new ways for realizing and developing his own conception of a responsive environment through the creation of different interactive environments. To avoid needless repetition, luckily descriptions and schematic of the apparatus used are included in the above-mentioned paper as well as two books.¹⁵ Gradually he moved from one-off setups conceived for particular lab or gallery-based installation-events (e.g., METAPLAY

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in 1970; PSYCHIC SPACE in 1971) to the development of a general compositional tool for devising many different kinds of interactions involving single or small groups of “participants.”¹⁶ The most well-known of these is VIDEOPLACE, a project begun in 1975 and continued at the University of Connecticut. A patent was granted for this work in 1989.¹⁷

Krueger’s work represents the first generation of research in the design of computational responsive environments. This work was undertaken in connection with university research and graduate programs at the University of Wisconsin and later the University of Connecticut and received support from nationally recognized granting organizations (such as the National Science Foundation and National Endowment for the Arts). In contrast to common-sense view of technology as chiefly about solving problems (e.g., in ways which may make our present lives easier), Krueger actively sought to anticipate, discover, and even generate new possibilities for the computational technologies he worked with on a day-to-day basis. He looked forward to “the next generation of technology [which] will speak to us, understand us, and perceive our behavior.”¹⁸ In the decades since, further advances and commercial developments in areas of computer graphics, projected video, and interface technology have delivered — for better and for worse — much of the technologies Krueger and his colleagues prototyped to familiar places where many live and work, in the West and increasingly worldwide.

Although it is interesting from a media art historical point of view, it is not Krueger’s interactive artworks or personal practice that particularly concern me.¹⁹ Instead, I am interested in understanding how novel arrangements of human-machine-environment come about, that is, *practice as it happens*. Put another way: I am not interested in artworks; I am interested in *behavior*.

No matter what designers of interactive computing systems variously think they are doing, no doubt most regard themselves to be doing something. The ordinary tendency to emphasize on the one hand the actions of human beings is frequently accompanied by an anthropomorphic gesture on the other. This is not unexpected— people have long tended to anthropomorphize, that is, to ascribe agency to complex phenomena, not only organic phenomena (living plants and animals) but inorganic phenomena (such as the weather). When a phenomenon is particularly momentous (such as a hurricane) or we expect to live with it a while (like a car or a pet), we might even give it a name. For example, I previously worked in a datacenter environment where naming computers

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was *de rigueur* among administrators for numerous practical reasons. Simple devices might only have been given a human-readable ID tag, while more complex or frequently accessed machines were often given human names, for example, belonging to famous historical figures or well-known fictional characters. A particular administrator I knew preferred to wait awhile until he had worked with a particularly complex solution for some time before naming it, presumably to understand its personality better, since a good portion of his livelihood depended on its reliability.

The expediency of ascriptions such those just above, as causal placeholders, is undeniable in connection with many other ordinary situations, too. In fact, I find it difficult to imagine smoothly functioning human-to-human interaction and communication taking place at all without it. Thus it is both common and unsurprising to hear seasoned programmers and designers ascribing agency to elements of software behavior as well. What's more, today machines are said not only to fulfill a particular function. Increasingly they are said to be *responding* to our behavior, that is to take an active role in shaping what happens, and playing a constitutive role in what occurs.

What is really going on here? No doubt the humans are doing something. But what about the non-humans (computational machines, software processes, display elements) in the situation—what are they doing? In addition, I want to emphasize whole configurations of named humans-machines-environment that are jointly doing something. That situations may be segmented for analysis in this way is undoubtedly useful in a number of practical situations, including the way I just suggested above, without the need of positing an “entity,” that is, something with a distinct and independent existence.

My view is that designers of interactive systems ought to categorically reject causalist notions of experience suggested in the prevalent language of psychology. This is for the reason that I believe it is unhelpful for understanding development to infer from ordinary occurrences the necessity of positing an anterior “doer” (as a *cause*) and then to proceed in grammatical manner to give that hypostatization a concrete status as an entity. I say this even while recognizing that many of the notions contained in the language of psychology are perfectly well-suited for conducting most of the day-to-day affairs related to organizing and carrying out projects for creating and implementing such systems. I have found, however, that, as a particular style of verbal expression, the predilection places an undue restriction on the designer who must necessarily go “beyond the

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skin” in order to understand a world that works differently.

Similarly standing in the way of understanding how novel groupings of human-machine-environment arise is a propensity to treat as separable the person who does something and the act of doing something. We do appear disposed to perceive doers and things done practically everywhere. This inclination is perfectly fitted for avoiding and recovering from unexpected situations that one might encounter on a day-to-day basis. While at one time we might not have managed to get across the street in the face of oncoming traffic or survived through the night without the ability to discern differences between objects and activities, perhaps today we don’t have to depend on the tendency quite so much of the time. The difficulty is that, once taken as a habit, the same predilection may be preventing us from seeing what in fact we very much need to see in connection with matters of vital interest. Learning to recognize needed change, paradoxically, requires unsettling and resettling customary ways of doing things.

Allied with language, the inclination perceive doers and things done as separable is surely beneficial as a heuristic for distinguishing between and directing attention to specific aspects of the world. The exhortation, “Look at this, not that!” is useful for coordinating and directing many of the practical tasks regularly undertaken in specialized areas, whether it is the kind of running commentary we engage in when carrying out a difficult task, especially one that is unfamiliar, or the instruction comes from someone else. Without further discernment, though, the prevalent appearance of doers and things done does nothing more than indicate “something happening.” The problem is that the commonplace inclination to separate inevitably creates a “gap.” Although the myriad problems created by the separation have been known at least since the ancient Greeks²⁰, this has not stopped philosophers in the West from inventing sophisticated metaphysical frameworks emphasizing one side or the other of a subject-object divide. Syntactically our utterances are misleading in ways that have important implications for projects involving epistemology and metaphysics. Yet, after more than a century of debate in the philosophy of language and logic, an adequate solution to the problem of correspondence (the immanence of meaning) has not yet been found. The matter is far from settled today. Indeed, there is little to suggest the disagreement will not go on indefinitely. For this reason, it is probably advisable to regard the “gap” as resolutely permanent until “proven” otherwise. Behaviorally speaking, it is the ongoing disagreement that is

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worthy of attention.²¹

In order to rethink the relation of humans and machines as behavior, I draw on a particular tradition of American philosophy, specifically the radical transactional behavioralist form of it advanced by the late cultural historian and critic Morse Peckham (1914–1993). I presume Peckham is not very widely read these days, especially outside of his home field of literary studies (he had a very broad notion of what constituted a “document.”). His important work on the relation of the arts and general theory of behavior provides the theoretical underpinnings for the view adopted in this thesis. For this reason, I have dedicated a chapter to introduce his main ideas. Based on Peckham’s model of behavior, I define behavior here as “somebody doing something.” However, behavior can also be understood to mean “somebody does something to someone else.” As expected, someone may or may not do something back, or they may do something completely unexpected; this uncertainty is the primary condition of behavior. Any coherent theory of behavior must be able to account for this observation; and it must be able to do so *behaviorally*, that is, in the terms of behavior itself.

Peckham described himself as working in the philosophical tradition of the American Pragmatists.²² He cited among his important influences George Herbert Mead, Charles Morris, and John Dewey who in turn trace their roots to Charles Sanders Peirce and William James. Like the pragmatists, Peckham held that the relation between the human organism and the world is better understood as a “transaction.”²³ Yet he went much further than the earlier pragmatists to assert “not merely that the proper way of conceiving the human organism’s relation to the world is as a relational transaction but that that transaction is a *semiotic* transaction.”²⁴ The move is a strategic one for Peckham in that without the argument for continuity grounded in the reality of experienced semiotic relations, as we will see, neither his radical theory of meaning nor his general theory of behavior would have made any sense. Peckham suggested that his own far-reaching position could be regarded as a type of semiotic phenomenism.²⁵

Peckham had earlier come to the conclusion that a crucial error had been made by those working on social interactional problems in maintaining “that the basic relation of the human organism to the world is the manipulation of the world, the quite literal movement about of objects, and that a sign is a substitution or displacement for the object of such manipulation²⁶.” He raised two

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primary objections: The first is theoretical: “Signs are opaque; we cannot understand the world without converting the world into signs. We cannot assume a meta-semiotic stance.”²⁷ The second objection is observable: “[...] *semiotic categorization precedes manipulation*. Semiosis, not manipulation, is the basic relation of the human organism to the world.”²⁸

The literature on pragmatism is vast and sophisticated; consequently such a brief discussion as this must be necessarily selective. The American philosopher Hilary Putnam offers a concise characterization of the three central tenets of pragmatism:

- (1) antiskepticism: pragmatists hold that doubt requires justification just as much as belief (recall Peirce’s famous distinction between “real” and “philosophical” doubt);
- (2) fallibilism: pragmatists hold that there is never a metaphysical guarantee to be had that such-and-such a belief will never need revision (that one can be both fallibilistic and antiskeptical is perhaps the unique insight of American pragmatism); (3) the thesis that there is no fundamental dichotomy between “facts” and “values”; and (4) the thesis that, in a certain sense, practice is primary in philosophy.²⁹

On the whole, the pragmatists, like the earlier empiricists, insist that all conclusions having bearing on practice be based on, and only on, terms drawn from experience; indeed, this is widely held to be the chief advantage and appeal of all forms of empiricism. For early pragmatists like James and Dewey, the ordinary notion of experience indicated something richer than could be accounted for separately either by “sense conditions” or “sense data” (to use more updated terminology), each of which had been treated separately as either an experience “of” (as exemplified, for example, by extreme forms of philosophical idealism) or an experience “for” (e.g., humans are merely the passive recipients of mind-dependent sense-data).

Indeed, as a loose group, the early American pragmatists began a style of philosophical expression to come to grips with the paradoxical notion of what intellectual historian Martin Jay has recently termed an “experience without a subject.”³⁰ At first sight, the notion of an experience without a subject of that experience would appear to be nonsensical, perhaps even frivolous. However, perhaps the idea is only seemingly paradoxical. The main point, and why this is useful to us,

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is that the pragmatists rejected any fundamental separation between the subjective and objective dimensions of experience.

At this point it may be useful to bring in an analogy from theatre in order to draw this out more clearly. In the course of presenting a play, various elements are assembled and arranged in a specially designated stage area. Acting is what the actors (usually human) do. Additional technical elements may be employed as further means to support the immersion of the viewer in the production. These include such things as lighting, sets, costumes, properties, sound, video, and so on. This activity takes place on a concrete stage in time and space. As well, members of the audience are understood at any given moment to be in distinctly separate position relative to the activity occurring on the stage. Certainly I am aware there have been numerous interventions in the twentieth and twenty-first centuries which have confronted or played with the existence of this convention.³¹ Nonetheless, the efficacy of these innovations (including its negation) depends on awareness of the convention on the part of the audience. Appropriately, the comparison to a performance stage also serves to suggest the prominence of the difficulty for consideration of aesthetic experience more generally.

The conventional description, so far as it goes, poses few practical problems, as evidenced by the fact that most theater goers think they understand well enough where to look and how to listen directly to what is being said and how to follow dramatic action as it unfolds. They can do all that, too, without worrying over such distinctions as physicists or philosophers may make. If one chooses, however, it is possible to put pressure on the situation simply by asking someone to point to the place where the dramatic action can be said to be taking place. If one does this, one can likely expect to be led in two directions: the direction of a physical stage full of working actors and theatrical machinery, and the direction towards a mental one.

For over a hundred years since the introduction of relativity and the ensuing “new” physics, a host of distinctive actors constituting not only the human performers, but also lighting, sound effects, and so on, may be objectively said to be in an energetic relation with one another and various audience members. In contrast, a great deal of confusion remains concerning the mental space in connection with the concrete world of physical actors. The two would seem to be separated by an ineluctable gap, across which communication requires something like mental action-at-a-distance

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or another mediating aspect of an even more basic physicalist universe.

The problem becomes even more forceful as additional variables are taken into account (including differences in age, gender, years of schooling, language ability, economic circumstances, differing cultural perspectives, and more—although, some of these at least allow for statistical control) and foreseeable interruptions are introduced (such as lapses of attention, shuffling of seats, inopportune bathroom breaks, and so forth). The problem becomes much less bothersome, as James argues variously, if we only think of the various subjective actors as related, that is, as part of a single activity (namely, in the above, *what the play does*). William James wrote, “... subjectivity and objectivity are functional attributes solely, realized only when the experience is ‘taken,’ i.e., talked-of, twice, considered along with its two differing contexts respectively, by a new retrospective experience, of which that whole past complication now forms the fresh content.”³² He called the “instant field of the present” the “pure” experience.

The first formal presentation of William James’s doctrine of “pure experience” appeared in two seminal papers (1904/1905) *Does Consciousness Exist?* and *World of Pure Experience*³³. Peirce scholar Max Fisch underscored long ago that it was the striking difference—what William James had termed the “radical empiricism”—of the early pragmatists with the Anglo-empirical tradition that is of importance, and less what they held in common with the earlier empiricists.³⁴ The “contrast” can be summarized on the basis of two assertions, offered by James in *The Meaning of Truth*: (1) “the relations between things, conjunctive as well as disjunctive, are just as much matters of direct particular experience, neither more so nor less so, than the things themselves”,³⁵ and (2) “the parts of experience hold together from next to next by relations that are themselves parts of experience.”³⁶ The relations are just as much matters of experience as the things and the part to part connections are themselves part of the experience. For James, experience is a “collective name” for “just what appears”—*that*, in all of its particular sensible qualities.³⁷ James located the conditions for his conclusions concerning the “truth” of relations directly in experience, without the need for invoking either a priori or “trans-empirical” principles. He did allow that particular non-sensible (trans-empirical) entities may exist, but it is pointless to argue about them. Accordingly, the truthfulness of a proposition appears to turn as much on what one is willing to stand on as it does on the “truth” of what is asserted to be the case factually.

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John Dewey later preferred the term *transaction*, despite his titular work on the subject matter of experience. In correspondence with Arthur Fisher Bentley (1870–1957), Dewey wrote that the word “transaction” better accomplished the work previously done by the word “experience” widely found in his earlier writing, including his own major work on aesthetics³⁸ *Art as Experience* (1934/2005). Dewey and Bentley eventually co-authored a series of papers on epistemology and logic published as *Knowing and the Known* (1949) in which Dewey characterized his entire life’s work as “transactionalism.”³⁹ The terminological move appears in part to have been taken to combat the psychologistic and mentalistic predilection for a strong notion of a changeless subject who is the purported bearer or possessor of an experience.⁴⁰ “Logic” for Dewey concerned the theory of inquiry, and inquiry, for him, was essentially a problem-solving activity.

What I find attractive about early behavioralists is a connected group of assertions, which may be summarized first as an attitude and second as a connected group of assumptions. In an early attempt to formulate adequate formal postulates for behavioral inquiry, Bentley summarized a view common to many of both early and later behavioralists:

This attitude is: that all physiological and behavioral knowledge is legitimately open to scientists for physical inquiry and interpretation; that all behavioral knowledge is legitimately open to physiological inquiry and interpretation as this develops in a physical setting; that in such inquiries claims and boasts have no significance, but only work accomplished; that, when all is said and done, physical and physiological knowledge, along with all the rest, is behavioral *process*, subject itself to behavioral inquiry and interpretation.⁴¹

The following additional quotes from Dewey are meant to highlight two of the main assumptions underlying the behavioral view I want to consider:

Behavior is in fact a function of the total state of the organism in relation to environment.⁴²

What is designated by such terms as . . . idea, conception . . . must be located and described as behavior in which organism and environment act together⁴³ . . .

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Further, in order to sidestep difficulties posed by traditional epistemological interpretations, Dewey insisted strict attention be paid to the “intermediate instrumental function, operatively realized, of our conceptions.”⁴⁴ In Dewey’s thinking, it is a mistake, also, to suppose that our conceptions are under any obligation to describe existential, that is non-mathematical, material.⁴⁵

An inquiry into behavior is analogous in certain respects to what customarily follows after the revelation that an important crime has been committed, the exact details of what took place not being known. During the course of early investigation, examiners typically may gather various statements and suggestions from relevant sources. A comprehensive statement of what happened would encompass, literally, everything that is—including what is also asserted to be—the case at the time. The complete details of what occurred may not be very important, strictly speaking, apart from immediate practical considerations in connection with determination of what exactly is to be done. Consequently, for purposes of space and time, only a limited picture is constructed, built up on the basis of extant evidence, and only to the extent that no doubt is left standing in the way of action.

Recall that for a finding to be met with general acceptance, its definitive expression must consist of a single authoritative statement in connection with the inaugural occasion, which is henceforth to be considered an example. Afterwards, re-examination of the case may only be obliged in the event of either an obvious error or the introduction of newly discovered information having important further bearing on the case, and not only because the matter might have been decided differently.

Many times, the case at least seems to be simple and straightforward—there may be plenty of reliable witnesses on hand who can provide testimony, and there is good physical corroborating evidence to go along with it. The task just consists of winnowing down the list of usual suspects (ideally to two). In more difficult circumstances, such as when the witnesses cannot be trusted or there are additional puzzling factors which cannot be easily explained, the statements provided may be subject to a greater degree of uncertainty than is usual. In seeking to uncover wanted information in regard to these, one must be permitted to pursue every idea and hunch wherever it may lead, at times relentlessly, until at last each has been pushed against the wall.

If at first a suggestion shows signs of hesitation, one is obliged to make short work of it. It

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is expected that statements may emerge that are at odds with one another, although separately each may be perfectly well-reasoned in its own right. Even though statements may conflict, they still may be systematically arranged side-by-side for comparison and analysis. Exploration may proceed this way in multiple directions and areas at once, continuing by degrees until sufficient evidence is located which may bring the case to settlement.

For a wider view of the need for behavioral inquiry, this time from cultural history, consider that the persistent controversy surrounding the death of Ferdinando Stanley, Fifth Earl of Derby in 1594 has remained in motion for over 400 years, even after the inaugural players have long departed the scene!⁴⁶ Here I depend on Leo Daugherty.⁴⁷ As Daugherty rightly points out, enduring claims in regard to important behavioral events seldom result from evidential disputes, namely, having to do with questions like whether specific evidence exists, or of what kind. Often, instead, disagreements follow from further contested vital matters occurring spontaneously, having arisen immediately or soon after the inaugural event and bearing on other possible courses of action occurring as a result. Indeed, a significant controversy may have a long and energetic life of its own, and difficulty cannot be decided by simple negation (e.g., by reversal or decree) or abstention so long as other operant factors remain to play their parts.

Having once been established within the wider culture, the division may be regarded as a resolutely permanent feature of that culture. So long as these remain in conveyance, satisfaction may not ever proceed by means of straightforward aggregation, even long after thorough investigation has been conducted and all statements made pertaining to the originary event have been gathered and well-sorted. A currently fashionable interpretation cannot claim the last word either, insofar as it imposes on what else is also deemed possible for action. A real question is where to place one's bets until the long-sought smoking gun is found. Among the competing claims on view, two subgroups may be usefully marked out for productive contrast. Neither of these may be persuaded alone on the basis of what the other presupposes; while it is possible that both groups are wrong, it is equally not possible that both are right. The crucial change needed must necessarily arise from a space of contestation, not consensus. The introduction of an alternative with reference to both of these is nearly always controversial. In spite of the uncertainty and risk, a fresh assertion is no less warranted by the recalcitrant catch-22.

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The Pragmatists at least seem to have found suggestive ways around some of the epistemological difficulties that allow for descriptions of an activity that is immanent not to subjects but rather to the process of configuration and action that constitutes the way in which it appears.⁴⁸ Recently, evidence of a renewed and expanded interest in experience can also be seen in approaches to culture and behavior bearing hallmarks of twentieth century continental influences.⁴⁹ Elsewhere I have pointed to rich presentations that can be found, for example, in recent post-humanist discussions and as well in the so-called “new materialist” directions taken in critical and cultural studies.⁵⁰

Somewhat closer to hand here, in the field of science and technology studies (associated with Karen Barad, Donna Haraway, and Bruno Latour, among others) can be found attempt to take dynamic material engagement with the world seriously. According to Barad, in contrast to “representationalist” approaches which hold words and things and theory and experimental practice apart, what “performative” alternatives have in common is that inquiry is directed at “the practices or performances of representing as well as the productive effects of those practices and the conditions of their efficacy.”⁵¹ Sociologist and historian of science Andrew Pickering suggests that a type of approach similar to those discernible in artistic practice, for instance, may point the way towards a more authentic account of how the world “really” is: one in which the boundaries between human, animal, and machines are blurred in what he has evocatively termed a “dance of agency.”⁵²

Consequently, and for learning, I have taken the view here that designers of interactive systems (and I include myself in this group) would do better to abandon causally deterministic notions of experience found widespread today.⁵³ This is because I think as designers we can get further in our understanding of developments by remaining always with the phenomena as activities of groups rather than looking on them as distinct objects or entities. Crucially, this means operative groups are to be accounted for by their “effects,” not by what is attributable to them as a “cause” (at least in a strict deterministic sense).

Aims of the Thesis

This thesis is concerned with a single problem, namely, What is the chance that a really new idea will emerge from practice? The question this research generically asks is: How can a philosophy of ‘experience’ be applied to the study and practice of art-as-research? Specifically, I consider the consequences of Peckham’s radical behavioral aesthetics in order to see what difference they make to a practice of making responsive environments. That activity is to be thought of as an attempt of an artist-researcher working alongside computational technologies to come to grips with the problem from a pragmatist view of the relation of the arts and behavior. The general relevance of the questions asked lies in the fundamental importance of the problem for all makers, in every place and every time. I want to maintain what is empirically useful about the ordinary notion of experience while refraining from the assumption of an entity that *has* an experience. In English, the two words *experience* and *experiment* share a common root, the Latin word *expiri* meaning “to try”; the ordinary sense of both words is enviably maintained today in the French *expérience*. It is the twinned sense of an experience together with an experiment that I want to hold on to about the notion of experience for going forward.

Overview of the Thesis

Chapter II continues considerations relevant to the questions asked generically in the introductory discussion above. Peckham’s work on the relation of the arts and general theory behavior provides the theoretical underpinnings of the approach I have taken. First, brief summaries of his most important works are provided for helping to contextualize his central ideas as well to situate his work in regard to its historical development and intellectual connections. This is followed by continuing analysis and discussion of selected aspects of Peckham’s semiotic behavioral theory of art. Particular attention is given to his novel theory of meaning-as-response. As a further aid to the reader, a primer of Peckham’s “language” of signs is also provided. Chapter III continues from the notion of a learning process to undertake a consideration of presuppositions relevant for ongoing practice. Attention is given in particular to important relevancies during early stages of learning something new or for the first time—from initial interest, to selection and development of working

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materials, to preparation for wanted further competencies. Chapter IV examines the problem of participation in regards to interactivity as it is relevant to understanding how particular instances of humans-machines-environment configuration come about or are achieved. Finally, Chapter V offers some brief concluding remarks.

Chapter II

Language of Signs

The work on the relation of the arts and behavior done by the American critic and cultural historian Morse Peckham (1914–1993) provides the theoretical underpinnings of the approach I have taken for this thesis. Since Peckham is not widely read today, it is necessary to position his important work and ideas for readers who are likely unfamiliar with this neglected thinker. Hence I have two purposes in this chapter. One is to provide a brief introduction for situating Peckham’s work and ideas in regard to their historical development and intellectual connections. The other is to undertake a beginning analysis and discussion of selected problems of relevance to makers of responsive environments. For these purposes, it is convenient to have recourse to Peckham’s terminology.

The chapter is organized in two parts. The first provides a basic overview of Peckham’s important work on Romanticism, behavioral aesthetics, and general theory of behavior.¹ Brief summaries of his most important works are appropriate to help contextualize his central ideas. The reader who is already familiar with Peckham may wish to skip this part and proceed directly to the discussion section. References to extended citations are provided for readers interested in going further with their own examinations. The second part undertakes a beginning analysis and discussion of selected problems Peckham was working on in relation to artistic behavior. This part of the chapter is a somewhat philosophical discussion of certain aspects of Peckham’s behavioral theory of art and language of signs. However, it is crucial to remember that Peckham, throughout his career, tried to talk about behavior, and not philosophy. As a further aid to the reader, I also provide a brief introduction to Peckham’s “language” of signs.

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At least a few comments are in order to prepare the reader for this discussion: In *What is Philosophy?* Deleuze and Guattari reserve the epithet “the plague of philosophy” for those critics who merely “criticize without creating.”² From another point of view, “creativity” designates just those critics who aren’t corrupt enough to stay bought when demanded of by changing circumstances. Very nearly forgotten today, Morse Peckham was at one time recognized as having made important contributions to the thinking about the process of “creative dissociation” in discourse. Today there is greater willingness to treat cultural deviance more substantially than just as the neurotic weakness of the artist. A large amount of work has been done by students of culture to move the notion of cultural transgression beyond mere symptomatology. Much of the effort so far has been aimed at popular culture, whereas Peckham went directly after high culture.

Morse Peckham (1914-1993)

Morse Peckham (1914–1993) was a distinguished American scholar of European Romanticism. But that is only part of the story; he was also an astonishingly original and brilliant social thinker who made important contributions in areas of criticism, cultural history, education, history and philosophy of science, literary theory, psychology of art, social theory, among others. Broad outlines of Peckham’s life and work and are provided in two essay contributions by his friend and editor Leo Daugherty and H.W. Matalene, a former student and colleague.³ Additional biographical details of his life can be found scattered in writings by other friends and former students.⁴ Peckham’s impressive career as a social and literary theorist spanned five decades. After graduating from the University of Rochester and Princeton University with a MA and PhD respectively, he went on to teach English literature at the University of Pennsylvania (1949–1967) and later at the University of South Carolina (1967–1980). After retirement from university teaching, Peckham continued to publish actively; there were 154 items in his bibliography at the time of his death, including his important works *Man’s Rage for Chaos* (1965) and *Explanation and Power* (1979/1988). The most extensive edition of his writings is contained in three volumes of collected essays: *The Triumph of Romanticism* (1970), *Romanticism and Behavior* (1976), and *Romanticism and Ideology* (1985/1995). Two previously published bibliographies are available: Daugherty’s bibliography,

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included in *The Romantic Virtuoso* (1995), expands and revises the original provided by Matalene in the Festschrift (1984).⁵

Peckham's study of Romanticism (in the widest possible sense) would require him to travel outside the boundaries initially set by his historicist training and later home department of English. His extemporaneous classroom performances were legendary among students and faculty who attended them. In the end, Peckham could find no self-contained field that would withstand his singular analysis. Given the extraordinary range of his scholarship, it has seemed to some over the years to be very hard to understand its development. It is inconvenient, perhaps, although Peckham's indexical style actually makes it rather easy to follow. “‘I used to think . . . , but now I think . . .’ is a figure so frequent in Peckham’s conversation that his friends sometimes needle him about its occurrences,” writes one former student.⁶ Whether from anxiety or because it was simply easier to start anew with a fresh take on a problem he was interested in, Peckham is reported not to have gone back to revise previous materials once he had worked through what to him seemed to be obvious and important.

From the start, Peckham approached the problem of Romanticism (What is it?) as a cultural historian—an immense undertaking, one might even say impossible.⁷ To paraphrase Peckham, there are as many Romanticisms as there are histories of Romanticism.⁸ Specifically, the question he asked was, What were those early individuals at the beginning of the nineteenth century doing? The situation the early Romantics were responding to, and what Peckham said made the Romantic innovation possible, was characterized by the collapse of Enlightenment expectations brought on by the Industrial and French Revolutions, and the “alienation from the culture and the society’s institutions” that resulted.⁹ What was decisive, Peckham concluded in the end, was the “behavioral pattern of emergent innovation”¹⁰ that unfolded consequent upon the tension generated between individuals and institutions. (Peckham’s definition of “emergent innovation” is “cultural transcendence” which introduces and establishes into a culture “a behavior which is unknown not only to that culture but to any culture.”¹¹) He wrote, “The importance of the Romanticism of the early nineteenth century is that a few innovative Romantics discovered and established within Western culture the basic behavior pattern of cultural transcendence.”¹² This pattern is characterized by a number of factors — in addition to (a) “the judgment of explanatory collapse” and (b) “alien-

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ation,” Peckham also identified (c) “cultural vandalism”; (d) “social withdrawal”; (e) “reducing the interaction rate to the minimum”; (f) “randomizing behavior”; (g) “selecting a promising emergent innovation”; (h) “collecting a little group of supporters”; (i) “propagandizing the cultural emergent or innovation or ‘creativity.’”¹³

What is unique about Romanticism historically is the enormity of the collapse but also the enormity of its consequences. What it came down to, at least for those very few individuals who were able to accept and make the most use of it, amounts to a decision (metaphorically speaking) being made, namely, the “conversion into permanent de-conversion.”¹⁴ To really understand what the early Romantics were doing, Peckham felt, he needed a good critical and historical theory of aesthetics. And since art is something that human beings do, he also needed a general theory of behavior. Ultimately Peckham considered the consequences of his interest in Romanticism that were likely of more significance.

Peckham thought of the different arts (however that word is defined) as connected, that is, engaged in a single activity. His major work on the relationship of the arts is *Man's Rage for Chaos: Biology, Behavior, and the Arts* (1965). many critics at the time complained in reviews that the book's complex arguments had been difficult to follow. In reply to the art historian E.H. Gombrich, in particular, who reviewed it for the *New York Review of Books* and whom Peckham felt had failed to the central import of his argument, Peckham tellingly suggested another and more crucial factor. Peckham summed up the main obstacle thusly: “He is interested in art. I am not; I am interested in behavior.”¹⁵

Peckham felt that philosophical aesthetics since the eighteenth century had made a crucial error in characterizing art as showing an unusual degree of “order,” namely, the fulfillment of “expectation.”¹⁶ In contrast, central to Peckham’s behavioral aesthetics is the notion that art is characterized by “disorder.” Disorder is a categorical term Peckham used to refer to the experience of disorientation, that is, perceptual and cognitive discontinuity.¹⁷ Peckham contended, “Whether the world is disorderly or ordered, we can never know, but we can experience it either way.”¹⁸

Yet, on the whole Peckham felt *Man's Rage for Chaos* had been a failure. He had intended his theory of art to rejuvenate traditional philosophical aesthetics. While it may have been scarcely noticed by philosophers inside philosophy departments, the book did however, become an under-

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ground classic, for example, on the New York art scene of the late sixties. In this way the work marks his emergence as an original theoretician of the arts.¹⁹ Peckham was quoted prominently by the artist Robert Morris in an influential series published in *Art Forum*.²⁰ It may still be his most cited work.

Peckham pointed out that what is traditionally called the “meaning” or “content” of an art work is demonstrably *extra-artistic*. What he called the “semantic” aspect of art may be interesting, even very interesting sociologically, but it has nothing to do with the essence of artistic behavior. The reason Peckham gave for this is that practically any “ordering” principle found in art can be found outside of art, too, and while it may in fact be necessary for the smooth production and dissemination of art works (related to art’s economic-political dimension), the semantic aspect of art alone is not sufficient to distinguish it from other types of human activities.

Peckham held, rather, the distinguishing aspect of art its formal aspect. To clarify what he means by “formal” aspect of art, he introduced term, specifically “non-functional stylistic dynamism.”²¹ When forms have been sufficiently internalized, their content may become very significant or valuable, but, indeed, their usefulness for distinctly artistic experience is correspondingly diminished.

Several useful abstracts and applications of his behavioral theory of art exist, for example in the volumes of collected essays. In one of these, “Order and Disorder in Fiction” (1966) found in the collection *The Triumph of Romanticism*, Peckham identified himself the three main conclusions of *Man’s Rage for Chaos*:

- (1) Art offers an occasion for playing the art perceiver’s role, and therefore one may turn anything into a work of art by playing the art perceiver’s role before it. (2) The defining attribute of the art perceiver’s role is exposure to perceptual discontinuity, or, . . . disorder. (3) The function of art as biological adaptation is that it enables us in protected situations in which nothing is at stake, in which we are not required to interfere with the world, to rehearse the endurance of cognitive tension.²²

The latter is important because, in the end, the only meaningful question about any kind of human behavior (including the arts) is, *Why anyone should trouble to do it?* In Peckham’s view this

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amounts to, What is art's function in the biological adaptation of the organism to the environment? Obviously this is not the only way one can respond to the aesthetic questions but it is the only way finally for Peckham, one-time editor of the Darwin's *Origin*.

Peckham argued that the various branches of the arts, as an adaptational mechanism, entailed a capacity to recognize important contrasts between patterns of behavior and the behavioral concomitants of interaction with the environment. Art, he held, is "rehearsal" for those situations in which it is vitally important—indeed, for survival—to hold out against perceptual discontinuity so that "a real and significant problem may emerge."²³ In his words, "Art is the exposure to the tensions and problems of a false world so that man may endure exposing himself to the tensions and problems of the real world."²⁴

Peckham continued to revise the theory of signs initially put forward in *Man's Rage For Chaos* in a series of writings that appeared subsequently to address what he felt to be the inadequacies of the book's discussion of signs.²⁵ He felt the treatment of signs in had been too dependent on Charles Morris.²⁶ He eventually found Charle Sanders Pierce's semiotic too unwieldy for his style of analysis. In the end he abandoned both, having made up his mind instead to roll his own.²⁷ Nonetheless, he saw his own contribution as a further development of the important earlier work begun by Morris and Peirce. Peckham maintained that no adequate theory of sign (as something that *has*, that is immanent, meaning) exists.²⁸ Peckham went on to establish his semiotic not in terms of sign, but in terms of transactional sign-process (or, *semiosis*).²⁹

Several abstracts and further developments of his argument appeared soon after his initial presentation. These can be found in three seminal essays found in the collected volumes. These are "Art and Disorder" (1966), "Order and Disorder in Fiction" (1967), and "Discontinuity in Fiction" (1967). The latest and most developed summary of his semiotic is contained in a lucid essay titled "Perceptual and Semiotic Discontinuity of Art" (1978) included in the third volume of collected essays, *Romanticism and Ideology*. By this time (it was written ten years after *Man's Rage For Chaos* was completed) his theory of signs had undergone significant modifications to bring it in line with his mature semiotic as presented in *Explanation and Power*.

He arrived at what he called his radical theory of meaning—or rather, as he said, was "backed into" into it—when he could not find a satisfactory theory of meaning in twentieth century philos-

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ophy and linguistics, namely, one that did not rely on an immanent notion of meaning.³⁰ His theory of meaning-as-response is derived in part from his study of the American Pragmatists George Herbert Mead, John Dewey, and William James, as well as other sources from sociology and social psychology. Peckham boldly asserted that the meaning of a sign is the response to that sign, that is, *any* response. His theory of meaning-as-response very nearly follows Mead³¹, although apparently he arrived at it independently.³² However, though improved by the time of *Art and Pornography* (1969), it was not until later, in *Explanation and Power* (1979) that Peckham felt the full implications of his theory of meaning had been satisfactorily worked out.

Matalene (1995) points out Peckham undertook to deal with the problem of interpretation first in “Intentional? Fallacy?” (1968). In that essay, Matalene identifies a crucial passage that gives a synopsis of the problem as Peckham understood it.³³ This passage is also important because it shows the way in which meaning behavior demonstrates the nature of a continuum:

Words are said to have reference. But when I say, “Look at the ceiling,” you look at the ceiling, the sentence does not. . . . Human beings . . . refer; words do not. Words are signs to which, on interpretation, we respond by various modes of behavior, verbal and nonverbal. The meaning of a bit of language is the behavior which is consequent upon responding to it. Therefore, *any* response to a discourse is *a* meaning of that discourse. . . . all the generator of an utterance can do is to present a set of instructions for behavior, either his own or another’s; and all the responder to an utterance can do is follow those instructions, or not follow them. That is, if he knows how to interpret those instructions he can, if he so decides, behave in accordance with what in that situation is the conventionalized appropriate responsible behavior. . . . We may discern, then, three kinds of response to any utterance: inappropriate response, partially appropriate response, appropriate response. These are the meanings of an utterance. (*The Triumph of Romanticism* 430–431)³⁴

Next Peckham would write *Art and Pornography* (1969) in which he began to explore the implications of his theory of meaning, this time through a discussion of the relationship of art, pornography, and sexual behavior. The book is interested in one problem: understanding pornog-

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raphy's semantic function. Several years prior to starting work on the book, Peckham had been called as a literary witness for the defense in an obscenity trial of the famous *Candy*.³⁵ Whether the work is or is not pornographic is beside the point; more importantly, Peckham's analysis of the interests at work in defining pornography is instructive in several ways. During the trial, the first witness, Peckham said, gave an eloquent and enviable testimony in regard to the work's artistic merits which, in the witness's view, made it impossible to consider the work in any way that could be construed as sordid. Peckham himself gave evidence to the effect that "art" and "pornography" are not mutually exclusive categories, but rather they are independent categories. In other words, if a discourse is categorized as one, it can be categorized as the other, or neither. What Peckham later said he had not realized up to that point was this also implied "there was nothing to prevent the rules for a genre from changing" just as "there was nothing to prevent the possibility that . . . [an individual's social] experience was too limited . . . to have a sound understanding of the rules" in the first place.³⁶ The lawyer for the defense privately and cynically confessed to not knowing, or caring, since the matter would likely be settled on appeal either way.

Even more revealingly, the final testimony for the defense, offered by a sociologist, was disconnected from the matter being discussed, and yet surprisingly seemed to carry the case. In the end, the judge based his ruling on legal precedent, reaffirming principles set forth in the landmark United States Supreme Court Roth case decision of 1957 which provided a test for the courts to use in determining what material can be labeled obscene and thus not constitutionally protected. By 1973 the Roth test had been abandoned. Remarkably, one of the reasons cited is the criteria set forward in Roth had become an economic and political burden to the courts.³⁷

In the preface, Peckham called the *Art and Pornography* an "experiment in explanation." His proposed explanation for pornography comprises nearly half of the book's text in a single chapter. Peckham held that no useful explanation is final; it is only tentative and provisional. Elsewhere, Peckham wrote, "a 'true' explanatory proposition is one that has heuristic value only."³⁸ Of the four strategies deployed in Peckham's beginning parable, the only strategy that may have enduring value is the one that enables one to learn to recognize both that rules can and do change and, what amounts to the same thing, that our current understanding of the rules at work may be inadequate.³⁹ In the case above, the rules may be literary principles determining whether an instance of

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discourse is a member of a particular genre of pornographic literature, or legal principles ostensibly representing “community standards” serving to regulate economic and political concerns.

Importantly, Peckham held that for any explanation to continue to be useful, it must remain open and unresolved in at least two related directions: one leading towards further activities of experimentation and one leading towards additional activities of (theoretical) explanation. In this way, behavioral inquiry regards itself as fallible and purposely tests itself and criticizes, corrects, and improves itself.

Peckham’s friend Robert L. Stewart, a sociologist with whom he collaborated at the University of South Carolina, saw that Peckham’s theory of meaning pointed toward a general theory of behavior and encouraged him to write it. Peckham took the outrageous step of creating his own general theory of human behavior.⁴⁰ For someone whose original training was English language poetry, certainly this must have seemed a very odd thing to do.⁴¹ *Explanation and Power* is Peckham’s next and arguably most difficult book. In it, he set out the consequences of his “radical theory of meaning,” namely that only “behavior controls behavior.” The book contains a thorough-going behavioral semiotics.⁴²

Anyone working seriously along Peckhamian lines would benefit greatly from reading *Explanation and Power* alongside the luminous essays contained in his third collection *Romanticism and Ideology*(1985/1995).⁴³ Peckham said the inquiry with which the whole volume is engaged was begun in the late 1950s, when he asked, “How can the philosophy of science be applied to the study of literature?”⁴⁴ He writes:

The basic proposition on which the essays in this book are based is that the only generally useful comprehension of “meaning” is a behavioral comprehension, the place of meaning in the rest of human behavior. Such a notion of “meaning” yields the proposition that the meaning of an utterance is the response to that utterance, any (verbal or non-verbal) response to that utterance. Since successful verbal interaction does take place, meaning behavior is controlled, but not completely nor with full success. The primary means of controlling verbal meaning behavior is verbal behavior, which is thus best conceived as instructions for verbal and nonverbal behavior. ... Behaviorally, one can only say that a response to an utterance is appropriate— more

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precisely, that it is appropriate only in the judgment of someone. . . . All verbal behavior is both normative and fictive.⁴⁵

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Frustrated with traditional accounts of verbal “meaning” found in in traditional literary and philosophical accounts, Peckham proceeded to roll his own behavioral conception of meaning. In order to get around the place of meaning in connection with the rest of human behavior, he introduced a conception of meaning, in its widest possible sense, founded in terms of behavior. Specifically, he proposed “the meaning of an utterance is the response to that utterance, any (verbal or non-verbal) response to that utterance.”⁴⁶ Noting that successful verbal interaction does indeed frequently occur, he reasoned that verbal meaning behavior is controlled, and that the primary mode of that control is verbal behavior. In his terms, verbal behavior— namely verbal *signs*— provides “instructions” for verbal and nonverbal performance. So far as he is concerned at all with the truth of assertions, he cautions that, at least behaviorally speaking, “one can only say that a response to an utterance is appropriate”, or more accurately “appropriate. . . in the judgement of someone.”⁴⁷ In point of fact, he contended that all behavior is both *normative* and *fictive*.⁴⁸

It is not possible to interpret the silence around *Explanation and Power*. Whatever the reasons are for its neglect, it seems inauspicious for the prospect of its widespread acceptance.⁴⁹ A former student quotes one reviewer:

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Peckham shows us the structuralist view of man [sic] in its most extreme form....

In short, meaning is something we add to objects, events, and people in lieu of a direct connection with them. Yet, because no causal relationships can be presumed to exist between stimulus conditions and either meaning or behavioral responses, human perceptions of meaning are aggressive, active, and discretionary, not reactive.⁵⁰

Real Dangerous Idea

We can begin to examine Peckham's thought by asking what he was doing in the course of that thinking; What kind of thinking is it? How are we to understand it? What were his interests? It is difficult to pin Peckham's thought to a particular standpoint. In fact, he expected — even wanted— his positions to change. Just to say, however, that his thought evinces a form of skepticism or process philosophy is to miss the point. Much more is at stake for him, namely, the possibility of a genuinely new idea arising from within practice and continuous with the “ordinary and extraordinary affairs of life.”⁵¹

Peckham suggested in the place of a static conception of history, a dynamic “sociology” or study of human behavior.⁵² In keeping with a tradition of naturalistic inquiry, if such an enterprise is to be technically “scientific,” it should at least exhibit basic coherent organization with physics and biology. Indeed, one of the most interesting things overall about Peckham's development is his recourse to the available science (especially theoretical) of his day to support his central arguments, with particular reference to early cognitive science and anthropology, as well as the philosophy and history of science, and above all, Darwin.⁵³

Peckham had provided the standard variorum edition of Charles Darwin's *Origin of Species* which appeared in 1959 to coincide with the hundredth anniversary of its initial publication. It is still the standard variorum text. (Peckham initially had hoped the project would revive the fields of Darwinian studies and the history of development, as well as stimulate interest in other great works of science.) His accompanying essay “Darwinism and Darwinisticism” (1959) is regarded as a minor classic in the history and philosophy of science. In it, Peckham reported that initial responses to Darwin's work had been mixed. They included “... those who totally rejected it;

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those who completely misunderstood it; those who incorporated it into their existing set of attitudes by misinterpreting it; and finally those who understood it and subjected their personal cultures to a complete restructuring.”⁵⁴

In keeping with the pragmatist idea that doubt needs to be justified as much as belief, only seemingly in reverse, Peckham suggested, “We appear to be faced with a curious problem, not with the impact of Darwinism but with the absence of impact. . . . We need . . . to explain not the rejection of the Origin, which is not too difficult to understand, but the perverting and self-deluding acceptance of the work.”⁵⁵ Peckham outlines four basic attitudes which he attributes to the Origin, which can be seen as well as characterizing his own core orientations to the problem of development:

[1] the biological world, and by implication the entire empirical world, is a complexity beyond our comprehension; [2] it is possible to create mental constructs which make sense out of the data; [3] these constructs are most satisfactory if characterized not by straight-line cause-effect thinking but by ecological thinking, that is, by the observation of patterns of relationships within and among fields abstracted from empirical reality; [4] one can hope for increasingly complex and reliable constructs.⁵⁶

The following is even more essential:

Darwin . . . had revealed that the whole mechanism of natural selection and the origin of species depended upon the *imperfect, or less than perfect*, adaptation of organism to environment.⁵⁷

Peckham supposed that the latter is “the basic assumption for the argument that we should burn with a hard, gem-like flame.”⁵⁸ In light of the latter remark, the hope expressed just above for ever more dependable theories can be understood agonistically, i.e., as a space of contestation, when one rejects the view that a scientific law (or any theory) is anything more than a mental convenience, a “construct,” which remains only to be tested, to be modified if not overturned⁵⁹—by bringing it into contact with new forms of thought and feeling. Peckham echoes this view when writes that “the world cannot be known . . . our modes of knowing and experiencing are instruments of the observer, not modes of comprehending metaphysical or even scientific truth.”⁶⁰

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Peckham was certainly an ecological thinker in the sense that he states his primary interest is to observe types of patterns and modes of human behavior. Moreover, he held that we can get a lot further in our understanding of development in this way, that is by situating analysis of phenomena of interest in terms of dynamic activities and happenings rather than static objects or entities. Indeed, I believe this is the starting point for the idea that if we have clearly said *activity*, then, already, we have said enough.

Peckham suggested that the concern with the style of the individual prominent in the twentieth century (and by extension the twenty-first century) was but the continuation of an undertaking begun by the early nineteenth century Romantics which arose in response to increasingly incommensurable new realities of materials and antinomies of human experience, and crucially the failure of classical accounts (as interpreted by the Enlightenment) to reconcile them.⁶¹ In the nineteenth century, the Neoplatonic hierarchy of form over matter was inverted, first by Hegel, followed soon after by a number of “economic” accounts of natural phenomena and their operation across different spatial and temporal scales of organization. (Darwin borrowed the terms “economy” and “polity” from Carl Linnaeus for his project.) These early immanentist accounts differed from their classical antecedents in their emphasis of dynamics and change over stasis and certainty.

Today, much of the work done previously by the words “economy” and “nature” is done better by the words “ecology” and “process” to indicate the interactions between any system (in its widest possible sense) and its environment as well as the relationships themselves. Nietzsche’s (another of Peckham’s primary influences) great insight, Peckham thought, was that the essential function of criticism is the postponement of final judgment, and by implication that values presuppose critique and meaning presupposes interpretation. Few still have accepted the full consequences of either Darwin’s really dangerous idea or Nietzsche’s activist style of philosophy; as far as they concern human beings, meaning-as-response and value-as-critique are both behavioral orientations.

While many of the questions Peckham asked are undoubtedly contemporary for their time (and ours), his replies have struck some as old-fashioned. Behavior was clearly an important word for Peckham, although why hold on to the notion of behavior when a phrase like “event selection theory” might suffice and thus perhaps avoid the problems of the individual and its psychology. This is partly because Peckham was often writing for at least two very different audiences, importantly

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one of which included his students. Partly for the same reason, he characteristically preferred terms which, in ordinary usage, emphasize their “behavioral” aspect (“behavior” for Peckham is “someone doing something”) in a way that similar words do not (for example, “procedural” rather than “methodological”).⁶²

Peckham also uses a number of terms which are “double-barreled” in William James’s sense, that is, they have both an observable content and a reference.⁶³ Peckham is not an either-or thinker. Like James on “experience,” Peckham undertook to reinterpret “sign” in order to open *all signs* to observation and further interpretation, and, potentially, to wide-spread experimentation in connection with vital matters. Peckham felt language in its ordinary personal usage to be fully continuous with sophisticated procedural usages, including the sophisticated modes of mathematics and logic.⁶⁴ Even as other specialized activities in the sciences might continue to bracket the issue (however temporarily) certainly for his inquiry into behavior Peckham could not. If the effect of polysemy or “multiplicity of meanings” of language is the ongoing source of distress, then, Peckham believed, the promise of a new beginning lay within that very instability.⁶⁵

Peckham provides a language of signs useful for analyzing our behavioral responses and for constructing further responses to them. There is no fully adequate theory of signs, even now, though Peckham maintained the version he presented in *Explanation and Power* was at least operable for furthering behavioral inquiry. Yet, as Peckham points out, no solution developed in response to a particular difficulty is ever completely adequate to new difficulties. In part, this is because the whole situation must be taken into consideration in order to provide a complete account. But this is an impossible task, surely, for the simple reason that there is always something new: a new *situation* which now includes (in addition) the solution developed as a response. Previously developed solutions remain available to be resurrected (for better or worse) when called for so long as their broad outlines are at least retained for transmission. Previously developed solutions to problems can and do wear out their usefulness; Peckham held that his theory at least shows how and why, and how they might be renovated.

Language of Signs: A Primer

Frequently, in many specialized activities, one must first gain an initial understanding of both formal (i.e., conventional) and semantic aspects before one can begin to make meaningful contributions. As it is convenient to have recourse to Peckham's terminology for beginning analysis and later discussion. Since Peckham developed certain terms and concepts in singular ways, including terms of his own invention (e.g., "explanatory regress" and "semiotic matrix"), where usage differs substantially from ordinary usage, I offer a definition.⁶⁶

First, the terminology I am proposing is not a philosophy; it is only a novel vocabulary useful for reading and analyzing response behaviors in order to continue learning from them. It is not possible to say with certainty what will turn out in particular instances; surprises can and likely do happen. This is in contrast to the situation typically encountered in classroom settings, for example, in which instructions prescribed faithfully and repeatedly along formal procedural lines are increasingly unlikely to generate unexpected outcomes. I think we all have to learn to be less dependent on controlled aspects of learning. If one grows too dependent on these, as habits or conventions, they can be particularly hard to let go of later when called for. It is for this reason that I try to strictly limit my theoretical assumptions, that is what kind or what form the data (namely, what humans do) ought necessarily to take.

To start with, what is a sign? Peckham astutely recognized that before it is anything else "sign" (as I just used it) is a word⁶⁷. This observation is not as puzzling as it seems. Peckham's point is that in asking the question, we are already engaged in verbal behavior. The meaning of a word can best be understood as an event of human behavior in the world once one rejects the view that "meaning" of the word belongs to the thing meant and "word" is retained for the organism.

For purposes of the discussion here anything that elicits a response is henceforth defined as a sign, that is "all configurations to which there is a response, that is to nonverbal signs as well."⁶⁸ Peckham proposes as a solution that sign and meaning-of-sign be taken as one in the sense that, behaviorally, what does not have sign-meaning is not a sign, and whatever has sign-meaning is a sign. Anything humans make therefore is unquestionably considered to be a sign. This is of great value for, as Charles Sanders Peirce averred long ago, signs are not only important for thought, they are they essence of it. Or, to look at it another way, my matrix of signs is me-myself-in-action-

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dealing-with-things together with its differentiated aspects and discriminated phases.

The next proposal to be brought in is that the “meaning of an utterance is the response to that utterance, *any* response to that utterance.”⁶⁹ That is, the meaning of any sign, verbal or nonverbal, is its response of which there can be many since Peckham held that meaning is not immanent to a sign’s configuration (or “sense data,” to use another terminology).

To draw out the final connected factor, consider that for smooth interaction to take place someone must judge that a response made is an appropriate response. Because successful interaction occurs “meaning behavior is said to be controlled.”⁷⁰ The principal means of that control is “verbal behavior” which is developed as “instructions for verbal or nonverbal behavior.”⁷¹ Behaviorally speaking, the “real” or “true” meaning of a sign is the active determination of appropriate response for that occasion.⁷² Schematically the stimulus occasion, the response, and judgmental behavior make up the “behavioral triad of meaning.”⁷³

Briefly, the following axioms comprise the rules of the game:

1. A sign is anything verbal or non-verbal that conveys a meaning, and vice versa.
2. The meaning of a sign is its response.
3. For any given sign, there are (theoretically) an infinite number of possible responses, as well as the possibility of eliciting just a single response.

Before going on, I want to first introduce a few more distinctions.⁷⁴ If we let the word *reality* demarcate everything in the acting world that has been named and categorized, then we can let *infinitude* indicate everything else before it has been so named and categorized. This distinction is only relative, of course. For, Whatever is overdetermined in regard to my experience may be characterized as a *redundancy* affecting only a few or many different parts of my reality. Whereas that of which I have little to no experience can be said to be still undetermined for me and related for the most part to my infinitude— along with all other signs of which there are in principle an indefinable number, including those most *random* to my experience.

Two closely related aspects of the “real” are suggested by the introduction of two additional terms. Let *actuality* be used to distinguish the engaged social-factual world in which the individual’s fusion is not free from the risk of physical violence and psychological denigration. Let

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virtuality be used to indicate an area located adjacently where nearly any interest may be safely and effectively considered from a position of relative impunity in order to learn from it.⁷⁵

When we respond to signs, either verbal or non-verbal, we are engaging in selective behavior.⁷⁶ Peckham writes:

[...] we do not respond to the world as if it were an unbroken continuum. We respond to segments of it. The very act of perception is a selective, segmenting act, just as logic selects from the verbal continuum certain words which it calls logical connectives and proceeds to build its structure from that act of initial perceptual selection. Thus, the appropriate way to respond to “entity” is not to engage in verbal behavior which struggles to define whether something is an entity or not—for that cannot possibly be determined—but to act *as if* it were separable from the continuum.⁷⁷

Perception is a selective act.⁷⁸ Peckham claims it does not make a difference whether the selective act is perceptual (non-verbal) or verbal; in order to respond to something, something else must be excluded at the same time. Just as a carpenter selects from the phenomenal continuum a suitable portion which he calls a nail and proceeds to build his edifice from that initial perceptual act, so too the logician constructs from words. Peckham’s account of causality (the relation between cause and effect) follows Hume and Wittgenstein in rejecting the idea of causal necessity.⁷⁹ The subtractive approach is undoubtedly useful for segmentation analysis, although Peckham argues it is not necessary to posit an “entity” underlying it, *viz.*, as a “cause,” to account for it. Like Wittgenstein, Peckham held the word “cause” does not add any useful information to our assertions.⁸⁰ Absolute certainty is impossible anyway when everything is presumed to be a casualty. Peckham does allow that relative absolutes, however, may still be possible (i.e., truthfulnesses, not “truths”) Put differently, the only necessities are *logical* necessities.⁸¹ Peckham adds:

The study of logic has at least reached the point of realizing that any [verbal] argument can be dissolved, and this can be done because no procedural rules are immanent in language.⁸²

Logic and logical rules in Peckham’s interpretation and terminology provide “*instructions for performance*—in particular, verbal performance . . . to someone who has learned how to respond

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to [those instructions].”⁸³ The readily observable phenomena of ordinary verbal behavior—words, sentences, and their silences —frequently serve as means-to-order more often than they do as a means-to-perform particular actions.⁸⁴ In other words, we use the word sign “when we are giving instructions to respond to a particular configuration or set of configurations to the exclusion of others.”⁸⁵ The means has no determinate value or importance in itself; its advantage lies in solely its availability for achieving some further effect.⁸⁶ The same effects may be brought about again by entirely different means, so long as contributing factors are sufficiently similar. Peckham held that semiotic behavior entails “categorical judgment involving a selection from the stimulus field.”⁸⁷ The following passage is helpful for understanding this aspect of Peckham’s theory of categories:

Behaviorally, a category in subsuming two or more words or propositions amounts to the assertion that it is appropriate to respond to such words or propositions in the same way, a response made possible only by neglecting some attributes of the items subsumed. Thus all utterance is revealed as fictive, since all terms are categorical. One acts “as if” two or more items were appropriately responded to in the same way.⁸⁸

adds two more distinctions (normative and fictive).

Both appropriate and inappropriate responses are “as if” responses, for both depend upon categorial selection from the stimulus field and on nonresponse to differentia as well as to nonselected configurations. But it must be remembered that there are no responses appropriate or inappropriate in themselves, that there is no ‘immanence of appropriateness,’ but that responses are appropriate or inappropriate only in the judgment of someone, whose judgment is a categorial judgment involving a selection from the stimulus field. *“As if” indicates, then, the fictive character of categorization, while the ‘ought’ indicates its normative character.*⁸⁹

Peckham writes “The world that our various modes of perception make available to us consists of signs.”⁹⁰ Perception is “deceptive,” “selective,” “normative,” and “fictive.” He continues, “it is better to say not that the world consists of signs but that the perceptual field consists of signs.”⁹¹

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His hypothesis is that “*As the world comes into our perceptual field, the world turns into signs.*”⁹² Peckham insists “we cannot understand the world without converting the world into signs. We cannot assume a meta-semiotic stance.”⁹³ (Peckham distinguished his position from philosophical idealism which in his view is just a rationalization of the non-immanence of meaning. Peckham referred to his position as “semiotic phenomenism.”)⁹⁴ How does this conversion happen? Peckham said it happens by acts of categorization and judgment of someone. I discuss these ideas as well as Peckham’s notion perception as an interactive dynamic field in Chapter III. Briefly, sign response behavior importantly entails the production of additional signs (a response field). Peckham called this conversion a “semiotic transformation.”⁹⁵ The relation of human beings to the world is semiotic.⁹⁶ Peckham held “*All human behavior is semiotic transformation.*”⁹⁷

Peckham’s contribution is valuable because it provides a fuller view of agency, but more importantly, a way to speak of the non-human world as an active contributor to the quality of lived experience, that is, of particular persons in particular places. At the same time it leaves open the possibility of an ontologically undetermined component that is not due to the epistemological limitations placed on it by perception/learning/behavior/cognition. Comprehension means (to paraphrase Peckham slightly) identifying the segment of the environment to which groups of signs, as signs, refer and the orientation toward that segment which those signs imply.⁹⁸ Not that signs refer, of course, people do. In this way signs are tied to purposes. Signs are categorical. They are useful for getting around.

Chapter III

Learning Process

What's New?

A question often asked at the start of a conversation is, What's new? Followers of a philosopher like Heraclitus or Alfred North Whitehead would likely say that there is always something new, without needing to step any farther than one's own backyard.⁹⁹ But look more closely at the word *new*, if you will, and consider the various senses in which it is ordinarily used. My dictionary distinguishes between three of these.¹⁰⁰ The first indicates something “not existing before.” This brings to mind the sort of original discoveries that one thinks of as forming the staple of science news web sites and high impact journals like *Nature*, as well as mundane innovations such as non-browning “Arctic” apples which soon may begin appearing in grocery stores.

The second sense of *new* connotes something “already existing but seen, experienced, or acquired recently or now for the first time.” For the most part, this second sort of new-to-me novelty is more common and of less significance overall; nonetheless, it may still give rise to considerable excitement depending on how it is revealed (think, if you will, of popular Internet memes as well as of kids ripping through presents). A third and more significant sense of *new* is indicated by something “just beginning” and “regarded as better than what went before.” This sort of new has the additional quality of being an improvement or an advancement.

Because—for reasons of time and space—no one can look at every deserving phenomenon, people tend to selectively look at and listen to those things and actions that are interesting, im-

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portant, or unique relative to their situation. In a world saturated with novelty, then, the main responsibility of each person is to make prudent determinations about what in their environment is worth looking at. With the definition of *new* previously discussed in mind, then, the question to be answered at the outset of a creative undertaking is not simply the frequent, What's new? More clearly put, the question would be, What's beginning now? But, more importantly, How does one *learn* to recognize that one is in fact dealing with a new situation?

The aim of this chapter is to take up the main question of this thesis, namely the possibility of a *new idea* emerging from within practice, beginning this time from an analogy with what Peckham called a “learning process.” In particular, I focus on particular aspects bearing on success during early stages, for example, when one is learning something new or for the first time; specific attention is given to the nature of perception, interest, and action. To motivate the discussion relevant to designers working alongside computational technologies, in particular, I suggest we are in the beginning stages of a cultural shift from quantity to quality with respect to changing socio-technological conditions. I examine the importance of “getting it wrong” in this context, as an essential part of learning to recognize that one is in fact dealing with a changed situation.

What's Beginning Now?

That we are at the beginning of something, historically speaking, is suggested in organization and policy discourse by the prominence of phrases like “social messes,” “enigmatic problems,” “wicked problems,” and even “super wicked problems.”¹⁰¹ The main difficulty can summarized this way: With every intervention made in a given situation, another unforeseen difficulty is likely to arise as a consequence; each of which must, in turn, be confronted and overcome if the overall situation is to be brought back under control. To an increasing extent, also, the proliferation of *effects* must be met and dealt with in real time. For these reasons, the degree of risk and uncertainty faced is higher than is usually encountered in day-to-day situations, and without immediate benefit of either controlled conditions or theoretical perspicacity which would allow for making the most of what are highly variable and potentially un-controllable factors. Hence any effort to achieve positive outcomes by conventional or available means must be disallowed as merely

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wishful thinking.

In the view that continued survival and success on this planet is understood as crucially depending on appropriate interaction between the organism and the environment, one is tempted to say these designers do not have the luxury of getting it wrong. On the other hand, “getting it wrong” is an essential part of any learning process. Moreover, in connection with matters of vital interest, it is of great importance to avoid the problem of either revolutionary or reactionary thinking. Accordingly, designers should find it conducive to “progress” (if one can still call it that) to locate a means for remaining with the vital activity, no matter what comes. Further on I will look closer at the importance of the notion of getting it wrong for beginning to think about a world that might work differently.

Against Technical Solutionism

According to Peckham, “Cultural history is the gradual emergence of [social] institutions which specialize in one particular kind of institutional control over culture, using the other kinds as subsidiary and subordinate modes of control.”¹⁰² French philosopher Gilles Deleuze has said it probably better than anyone in a short influential essay titled “Postscript on the Societies of Control” originally published in 1990. He wrote, “Types of machines are easily matched with each type of society — not that machines are determining, but because they express those social forms capable of germinating them and using them.”¹⁰³

We live, Deleuze held, in a *control society*. For me, the word *technology* is properly covered under the category machines.¹⁰⁴ The technology currently exhibiting the widest influence is undeniably computational. In a previously published essay¹⁰⁵ I considered the notion of computational machines as creative collaborators alongside a critique of essentialism found haunting the models of human-computer interaction prevalently in use today. There I suggested an alternative approach emphasizing *partiality* in design practice, following on Félix Guattari’s notion of the machine as a partial object. Obviously computational machines don’t do anything, any more than words do.¹⁰⁶ To say otherwise would admit something else “behind” it (a spook or a ghost) or, what amounts to the same thing, collapse all behavior to mere behavior. This is absurd. Even so, the prevalent view

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is that it is mainly the humans doing all the important doing. The question is, moreover, How are “things done” made relevant for the project at hand? Or, to put it in different language, How does that activity compose with human consciousness?

For the designer working mainly alongside computational technology, its chief appeal would appear to be its seemingly unbounded capacity for providing new solutions. The emphasis on solutions made in connection with the promotion of technological innovation in particular as seen in the areas of information and networked communication technology of the last decades, has, I think, worked too well as a tactic for distracting both conservative and reactionary movements who would otherwise oppose accelerations brought on by new realities of materials.

In connection with current economic and political policy, this way of thinking has effectively attained the level of ideology which one might call a “technological solutionism.”¹⁰⁷ The tendency to strictly evaluate technology proposals according to discerned fitness for a set of given problems ought to be converted or abandoned in favor of one which would allow us to develop techniques for remaining responsive to continually changing circumstances and needs, no matter what comes. Hence, an alternative conception of technology is needed to stand in contrast to the ideology of solutions.

Looking Backwards and Forwards

Coming historians may look back on events occurring close to now to see that, among the hustle and hubbub of makers working alongside digital computing technologies, new forms were clearly starting on their way to achieving high levels of sophistication and achievement even though only a few cases may have been marked of interest at the time. Documentary sources which allow for later detailed examination of particular instances of site-specific installations may be available. Recorded interviews with principal artists, assistants, and audience members would provide first-person narrative perspectives. Additional information may be obtainable in the form of technical drawings and durable equipment.

Even more promising, some of the preserved apparatus may still function, having been kept up and maintained in good working order by dedicated conservators. Access to older and harder to

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find replacement components may be available, too, thanks to the lasting support of appreciative technical enthusiasts or specialists. Continued availability of these along with firmware updates compatible with new ecosystems may enable traditions that include a performance element to remain active, as well as allow belated new ones to arise independently. Entrée to these may allow opportunity for direct experience of sorts.

For grasping more difficult to understand details of context, pertinent information concerning contributing factors leading up to and following from the examination of similar other events occurring in adjacent areas may be gotten. Alternative documentary sources may exist that are scarcer or more difficult to access. Examples of some of these include annotated program instructions, software version control logs, encrypted data repositories, uncatalogued video and image collections, archived weblogs, recovered email correspondence, chat logs, metadata, system logs, and so on. Specialized training may be required in order to retrieve information from offline media, dormant server caches, and secure data repositories.¹⁰⁸

The availability of primary and secondary materials may permit the establishment of specialized areas of study functioning to explain and make sense of them. Disagreements can be expected to emerge, for example concerning differing interpretations of these as well as conjectures as to the reasons for gaps found in the digital record. Such disagreements are hardly pointless, but they are not what they seem. In fact, anticipation of such disagreements is commonly considered justification for setting up supervisory committees from the outset whose main function it is to oversee disputes that inevitably emerge. In turn, the decisions arrived at supply examples illustrating agreed upon criteria. These may be used for prescribing future areas of research, for supplying materials for related instruction, and for feeding into canonization procedures. Important controversies may be kept in motion, for instance, by rival preferences concerning how subsequent exemplars ought to be admitted and sorted.

On the one hand, one could choose whether to agree with the likelihood of the imagined sequence of events as I have just presented them. But I believe that candidly stating my assumptions this way from the start in regards to likely outcomes allows me to disengage from the situation somewhat so that I can begin to “see” action in the thing along with the thing in action, and thereby discover a way perhaps to turn the situation to advantage. Looking forward, I do worry

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the support enjoyed by enterprising research (research-creation, for example) is too dependent on transitory external considerations (namely economic and political) that currently place a high value on any innovation whatever as a potential Good Idea™. Established scholars and researchers may welcome the uncertainty as an opportunity to break away from hardened disciplines having failed so far to become loosened from within. Upcoming and more energetic faculty are likely to be interested, too, if just for necessity of distinguishing themselves from the old guard. For that reason also, those who are able to obtain tenured positions may be very interested subsequently in placing limits on the range of possible responses in the future. Were a “performative” approach to become well established (as a method), I can imagine it would present a real problem for those coming up after.

The usual objection to the deficiencies of specialization continues to evade the problem so long as what is proposed instead is derived trivially from lines made up only of hybrid “methods.” The individualized approach cut loose from restraints can often produce brilliant results, but comes at the high cost of additional energies not being left available to practitioners for developing their own paths, hence decreasing the likelihood of a new idea coming from within practice. Moreover, the undisguised approach to innovation only increases the likelihood of a forceful backlash coming from departments that have become further divided along methodological lines, paradoxically increasing dependence on higher levels of administration and second-order analysis (or meta-analysis) for settling disagreements that arise as promoters of a current state of the art seek to maintain dominant advantage. As a consequence, those left presiding over the thus fractured activity would still be in a position to reap sometimes substantial rewards, and so may be especially tolerant of highly unusual or surprising approaches.

We can suppose, then, there is a productive tension between, on the one hand, the porousness of disciplinary boundaries widely acknowledged as being important for maintaining high levels of scholarly and artistic achievement, and, on the other hand, the prominent attention given to “productivity” and “efficiency” concerns by a large portion of the professionalized disciplines. This complementary relationship may even be construed as necessary, for the reason that without the other each alone may not even be comprehensible. Rather than perpetuate the perception of these as competing forces, I prefer to think of them as two different aspects of a single activity.

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When reviewing the alternatives, these considerations ought to be taken into account in regards also to the present needs and interests of makers themselves. The observations made just above perhaps lend credence to a cautionary remark heard made by a senior faculty member to more energetic graduate students to the effect that artists need the university now less than the university needs artists. Undoubtedly, the situation of the artist today can hardly be made clear by giving satisfaction alone to economic concerns (including, especially, professional aspects) or locking in the production of trivialities.¹⁰⁹ An appropriate question in this setting is whether artistic behavior is even teachable, and if the university today is the right place to do it. Perhaps all that can be taught are specific techniques for handling certain practical aspects related to some specialized activity.

For what reasons someone initially develops an interest sufficient for lifelong occupation in some specialized area of activity, no one knows, although it is not uncommon to come across anecdotal accounts if nothing else. For example, in interviews or memoirs, particularly sought after professional actors and other well-known personalities often recall a time when someone with more experience in the same line of work told them (or they told themselves) they had a knack for doing some particular task. Supposing they are also asked when it was they first showed an interest, they may also recollect an even earlier episode, for example when they were much younger or had only just been playing around with the idea, alone or perhaps with a bunch of friends of a similar age. Two observations can be made. First, for something to have risen to a level of interest and importance already presupposes a capacity for response. Second, attention and awareness do, at least, appear to be minimally necessary conditions for later accomplishment.

The flexibility exhibited by language is advantageous, especially during early stages, for example in creative consultations where the main experiential elements are initially being discussed between collaborators. While talking through possible scenarios, the “content” of the conversation may change rapidly and radically as new ideas are put forward, without posing any practical problems for the discussants. The outcomes of such conversations are doubtless important since the decisions made impact on stakeholders responsible for the assorted related technical undertakings necessary for realizing the project. Narrative accounts of happenings, such as the one related at the beginning of Chapter I, are useful for singling out configurations entailing humans, computing

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machines, and environment.

Indeed, during the exploratory phase connected with the initial planning of an event, a similar strategy was likely used by the creators, for example, during an early production meeting when the feel or flow was framed in terms of the start and end of a coordinated experiential trajectory beginning from the initial moment when a visitor enters, following from and extending through successive stages, until their (inevitable) departure. One would certainly expect to hear quite different stories told from the distinct points of view of actual participants, depending also on what was noticed at any particular moment. At the same time, no single account or set of such experiential trajectories is sufficient to explain what happens. A complete statement, were it even obtainable, would encompass literally everything that *is* and would produce far more data than can effectively be handled.

Of course, the use of language to structure action is important as a project unfolds across the different production phases: research, concept and technical development, implementation and production. Crucially, the designer must transform the metaphorical languages ordinarily used by creators to talk about an event into formal invented languages of algorithms and operations that a machine, in particular a computer, can follow. As a leading strategy then, narrative accounts of connected events are only useful up to a point, after which there is a strong wish for a technical language that would support a full range of possible trajectories, including those not anticipated ahead of time by the creators. What's more, it also needs to support the possibility of a single trajectory, that is, not only the artist's intent, but also any particular experience actually had. The designer tasked with rendering software and hardware frameworks necessary to support proposed scenarios faces enormous practical challenges for the construction of experiential analogs of narrated accounts.

For continuing forward, what is wanted is a way to think the transition directly in its passage. However, can one not already make out the contours of an approach that would allow one to remain with the primary activity, no matter what comes? Whereas the theorists do finally get new study objects to exploit in the end, what do those who are in the field first get for their efforts? Surely the welfare of those only just now coming into the field is more important than spurious concern for present well-being or comfort; one could make up one's mind to give full support to those just

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beginning. Doubtless any conjecture made in regard to the needs of future makers is full of risk and uncertainty, although a risky investment is ordinarily considered sound for one whose investment horizon is at least as long as the term of the investment. A viewpoint I arrived at some time ago is that only undertakings worth the considerable risk and effort involved are those with which I could conceivably spend a life. *What is finally needed then is an orientation that would permit long-term, unlimited and original development alongside ongoing scholarly and artistic practices and in connection with a wide array of day-to-day activities.*

Acts of Perception

I want to look closely at the importance of getting it wrong in connection with learning. The question provisionally asked above is: “How does one learn to recognize that one is dealing with a new situation?” But before examining what is presupposed for learning, it is necessary first to make some preliminary remarks concerning Peckham’s theory of meaning-as-response as it bears on perception.

Briefly, for him, perception is “normative” and “fictive.” Recall that perception, for Peckham, is a selective action. He put it like this: “Semiotic or sign behavior . . . involves the categorization of a configuration as a sign”¹¹⁰ and “[w]hen a configuration . . . is perceptually distinguished from its ground, it is then a sign.”¹¹¹ Again, to be clear, signs do not refer; signs are categorical.¹¹² The act of perception is not only categorical, it is also “judgmental,”¹¹³ that is it entails a “decision,”¹¹⁴ or what Peckham (and Peirce) also calls a “determination.”¹¹⁵ One could also say that perception is theory laden in that it entails assumptions about the way the world works.¹¹⁶ In short, perception is categorization and categorization is largely a matter of convention.¹¹⁷ In Peckham’s terms, this has to do with the “normative” aspect of signs.

Peckham proposed that “[a]ny configuration can be perceived in a perceptual field. That is, there is no limiting factor determining what can be seen as a configuration.”¹¹⁸ Moreover, the same configuration may be responded to differently by different persons or, similarly, by the same person at different times; or different configurations can be responded to as if they were the same configuration (This is something computer vision really has a difficult time with). If there is no

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theoretical limiting factor for definitely ascertaining what may be responded to, are there practical limits? Obviously, in regard to human perception the answer is, Yes. The human sensorium expressed by an individual's specific genetic heritage and shaped by environment certainly places restrictions on the type and range of stimuli one can become aware of via the senses.

For a particular configuration of the world to become a sign, selected perceptual attributes must be directly responded to analogically by transferring an already established response to a configuration never before encountered. “[A] hitherto unencountered configuration is responded to with an already learned response if certain perceptual attributes are in common to a class of configurations.”¹¹⁹ In his example, a lumberman in a forest categorizes a particular tree as the kind of tree he is looking for. “This he has done on the basis of perceptual attributes common to this tree and trees he has previously encountered.”¹²⁰

Configurational categorization represents the first stage or level in Peckham’s account of sign response. However, the act of categorization can only be performed by neglecting or ignoring a large number of other perceptual attributes. Perception is not built up; it is a selective act involving the transfer of responses already learned in other situations. This strategy works fine when the perceiver already has a reserve of ready responses at their disposal. We appear at least to have learned to attempt to categorize unidentified configurations. Initially there is a feeling of tension; that is, what initially appears to be discontinuous, or “random,” from experience does not appear first as a sign. Even so, Peckham insists, it is immediately turned into a sign for initiation of a learning process. “Response can then vary from complete randomization of behavior to the fixation of attention on the unidentifiable configuration. But that fixation of attention, as well as the random behavior, is itself a response.”¹²¹

Peckham’s notion of a “perceptual field” is a dynamic concept.¹²² The field metaphor comes from physics. As a physical account, a field theory usually describes how one or more physical fields interact with matter. However, Peckham refuses to reduce his understanding of behavior to any single biological attribute (such as “mirror neurons” or “empathy”). As lived process, Peckham understands behavior to be neither strictly physiological, nor physical, nor subsumed in every respect by biological or physical inquiry. Nevertheless, in regard to an individual organism with a distinct existence, Peckham does allow the perceptual field has at least some dependency

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on physiology, as it is one of the processes that stops when the heart stops beating.

Frequently in Peckham's constructions there are at least two predominant interacting fields relative to the position of the biological individual in a given situation. To give an example, in his discussions of perception and semiotic behavior, he refers respectively to a "stimulus field" and a "response field." Usage of the terms stimulus and response risks confusion with causally deterministic stimulus-response (S-R) theories that were prevalent in twentieth century psychology, although this is not at all what Peckham has in mind. His reciprocal notion of action comprises a productive relation; namely, the organism in effect generates a response sign field when it encounters a stimulus sign field. Peckham explains, "*As the world comes into our perceptual field, the world turns into signs.* And once that happens, by acts of categorization and judgments of interchangeability and noninterchangeability, we construct perceptually a fictive world."¹²³

In order to understand what is meant by the "fictive" aspect of signs, and that one may grasp its import for agency, it is helpful to get a glimpse of just how far Peckham's realism goes. In many places he explicitly disavowed philosophical idealism, especially the extreme (or subjective) idealist version, namely, the philosophical position that maintains reality is entirely dependent on the minds that perceive it.¹²⁴ While Peckham clearly did not deny that the world exists, he did hold that the world is not able finally to be known (something perhaps he learned from Kant).¹²⁵

Philosophers and psychologists have argued endlessly whether one can have an intuition of the world in regard to knowing something instinctively. It may well be as Peirce suggested long ago that our subjective feeling of having an intuition of the world depends first on our having an ability to openly presuppose its possibility (logically) prior to its being raised to the level of cognition, conscious awareness¹²⁶, or knowledge. In fact, what Peckham is talking about might be better called something other than "knowledge," if by that one means something like justified true belief. The knowledge acquired may be shown later to be false, hence non-knowledge. What Peckham is after is just something that takes itself as the world, rightly or wrongly.¹²⁷ Peckham proposed that humans act "as if"¹²⁸ we have immediate knowledge of the world. That is, the situation is the same for us, behaviorally speaking, whether the world is "really" there or not.

The most important consideration for human behavior (semiosis), Peckham held, is that the organism "responds to the produced sign as it responds to the sign when encountered in its original

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perceptual field.”¹²⁹ Since an act of perception entails the production of signs, as he frequently says, behavior becomes not merely behavior, it is turned into a “performance.”¹³⁰ For this second level or stage of sign response he uses the term “semiotic transformation” to refer to the process of “semiotic selection, abstraction, and reproduction.”¹³¹ He identifies three intrinsic factors of this process. These are “attributional preservation,” “semiotic modality,” and “style.”¹³²

... the world turns into signs as it enters any person’s perceptual field, and his response to signs is to generate more signs. The signs to which he is responding are transformed into the signs he generates or produces. Three factors may be discerned in this transformation: (1) the degree of preservation of perceptual attributes of the sign field the semiotic transformation is responsive to; (2) the modality of the semiotic system into which the transformation is made ...; and (3) the interests of whoever is engaged in the transformation.¹³³

Consequently, “[o]nce the behavior of semiotic transformation has been established, it is then possible for the organism to combine signs and even invent signs freely.”¹³⁴ However, according to Peckham, that “freedom” is not available to other animals.¹³⁵ The burden of that freedom is uniquely ours as well. This is for the reason, as he put it, that “sign behavior must be verbally categorized as sign behavior — must become semiotic transformation — for that freedom to be possible, for only verbal signs can subsume in the same category two or more configurations which have no perceptual attributes in common. *Thus in humans all sign behavior (that is, virtually all behavior) is ultimately dependent upon verbal behavior.*”¹³⁶

Evidently Peckham needed to hold onto the distinction between the stimulus field and response field, hinged by semiotic transformation, in order to preserve the speculative value of his account of semiosis (semiotic response behavior) and for his project investigating explanation, namely how behavior controls behavior.¹³⁷ To indicate the uncertainty, open-endedness, and speculative potential of this process, he himself suggested a more appropriate word than freedom is “indeterminability.”¹³⁸ Indeed, he stresses the crucial element is the “randomness” of semiosis¹³⁹.

To be sure there are other modes of semiotic response behavior, too, not only perceptual modes (i.e., non-verbal modes). But because of semiotic transformation, perceptual analogs can in prin-

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ciple be constructed for any others. Peckham himself held that what is called “performative” in J. L. Austin’s terminology is covered by the fictive aspect of signs.¹⁴⁰ Indeed, he argues very strongly in *Explanation and Power* that the conventional and performative aspects (respectively “normative” and “fictive¹⁴¹” in his terminology) of verbal signs are transferable to nonverbal signs as well (the latter including persistent sign behavior such as tool-use).¹⁴² “Verbal behavior . . . differs from nonverbal behavior because, by means of connectives (connectives which make possible the continuation of the hierarchical categorization initiated in nonverbal behavior), it constructs explanations and because it can validate not only constructed alternatives but any random response to a nonverbal or verbal sign.”¹⁴³ In this way, the non-immanence of verbal behavior, having been carried over to nonverbal sign behavior, greatly extends the normative and fictive possibilities of semiotic categorization, and therefore of perception.¹⁴⁴

Process of Learning

Most of the time one cannot just believe whatever one wants in regard to some specialized activity or area of interest, suggestive of a kind of “anything goes” attitude. First it must become a “genuine option” (to speak like William James). Let’s look closely now at what has been accepted for beginning learning. Getting experience is a foremost concern when starting out. The question asked is, How does one attain something akin to a skill?

First of all, every student must be clear about what is expected from the start. Ordinarily in a learning situation one is not concerned to prove anything “true” or “false” beyond any doubt. Instead, it is only important to show what an assumption held entails for practice. Initially an explanation offered must be accepted simply at face value, particularly when one is demonstrating something new or for the first time. A serviceable explanation is not a vague plan, although its precise import may be ambiguous at the start. It follows that an explanation is usable only if it has definite consequence for action; namely, one can work out the details as one goes along. In practice one can do this simply by considering what would necessarily be involved if such-and-such were true; in this way presuppositions are linked with consequences. Whatever else must be learned first must be learned by doing. For going forward, an explanation accepted for use retains

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its usefulness to the extent that it continues to allow us to recognize beneficial information needed. Once its initial usefulness has worn out for us, nonetheless, it may continue to serve as material for conducting further experiments.

Peckham defines learning as “the acquisition by the organism of what in his situation is judged to be the appropriate response to signs.”¹⁴⁵ His argument is briefly thus: [T]he response to be learned is innovative to the human organism engaged in the learning activity; and the factors that are the precondition of the learning are the production of response, the production of random response and the selection or validation of one of those random responses.”¹⁴⁶

From the example of the student posed, during the early stage of learning, all of the answers offered in response to a teacher’s initial prompting questions are judged to be “inappropriate;”¹⁴⁷ that is, the answers have a tendency to be unpredictable or “random.”¹⁴⁸ But upon examination, merely responding to the teacher’s query is regarded as perfectly appropriate classroom behavior; indeed, it is necessarily so, Peckham suggests, in order that smooth interaction can take place in the classroom.¹⁴⁹

This dialectic process can be viewed as an oscillation between overdetermined and undetermined responses, and the strategies used to narrow the range, if possible, to a single response.¹⁵⁰ As the learning-teaching situation develops, various strategies are entailed that are useful for narrowing the possible responses of the student to a selected and validated response, even if only temporarily.¹⁵¹ Peckham describes the interactional organization of control in a learning and teaching situation as dyadic or “semiotic dyad.”¹⁵² That is to say, what the student does, Peckham says, is learn to respond to his own behavior the same way that he responds to others, by observing it. Although the learned behavior may be conventionalized for the specialized activity in which he engaged, the behavior is innovative to him. Thus response behavior changes as it is learned.

This brings us to an important, and often overlooked, aspect of disciplinary training, that is not its tendency to produce ever more study “objects,” but rather its productive capacity for generating scholarly “subjects” who subsequently, in the course of responding to their own work, may learn to determine their own meaningful problems; the student learns to play the role of teacher for themselves.¹⁵³ Most of the time one learns simply to ignore what is judged to be unimportant or uninteresting relative to one’s situation. Indeed, Peckham insisted that perception itself is a

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semiotic transformation interpreted by interests.¹⁵⁴ “[T]here is no such thing as the innocent eye, or, we may add, the innocent ear or the innocent touch.”¹⁵⁵ Actually, from this point of view, all perception is a matter of acquired taste.

Peckham proposed “the basic unit of human behavior is sign response, *not* the individual organism.”¹⁵⁶ He held that the “The raw material of learning … is the production of random responses.”¹⁵⁷ “Sign response is not genetically transmitted, and therefore it must be learned, and it follows that it must be taught.”¹⁵⁸ However, he presumed the capacity for response itself had a physical/physiological basis. He proposed that it is the brain’s capacity to generate random responses that was likely the most important factor.¹⁵⁹ He even speculated that, from an evolutionary perspective, the brain’s capacity for random response may have had “survival value.”¹⁶⁰ Obviously this is arbitrary, for Peckham (following Darwin) held that any object—organism, document, artifact, sign, tool, interest—opens onto an “infinitude of complex relations.” Every pressure to begin is marked by a process of beginning extending indefinitely behind it. No doubt for this reason it is pointless also to seek after an originary point. Likewise, a fresh beginning cut off from the entire history of previous responses is equally impossible. Besides, for learning it is not necessary to have a comprehensive familiarity with previous conditions at the outset, nor is it sufficient for understanding development.

The important point of his analysis of the learning-teaching situation is that response is not dictated. Indeed, learning exhibits the character of a continuum: “In learning any response … it is possible to learn a response that occupies a point on a continuum between total competence [in the judgment of someone] and total incompetence.”¹⁶¹ That is to say that although meanings (as response) are not determinate, they are determined, by a *process* of learning.¹⁶² It follows that whatever is learned can be unlearned, or better relearned. The crucial idea here is that the randomization of behavior is the key to the possibility of a new idea arising from practice.

Chapter IV

The Problem of Participation

As an artist and researcher, I am always on the lookout for better means of support (financial, conceptual, theoretical, technical) that allow me to continue my work. I long to establish a situated means for always remaining with the most important activity, no matter what. Being “situated” in this instance means that “situatedness” matters. It means that the *situation* affects one’s capacity to act and, thus, directly contributes to what happens. This brings us directly into the realm of action, and in this chapter we will examine the problem of participation as it is relevant to understanding how particular instances of humans-machines-environment configuration come about or are achieved. Indeed, a leading proposal here is that configurations of humans-machine-environment are more fruitfully understood as occasions of *jointly-doing-something-together*.

In Chapter I, I began with the question of what those involved in the creation of responsive media environments were doing jointly together. For understanding instances of operative groups, I have found that I need to be able to observe and respond directly to whole occasions of *makers-working-together-with-machines*, as well as *makers-working-together-with-other-makers-working-together-with-machines*, and also *myself-knowing-groups-of-makers-working-with-machines-in-language*. Indeed, I do not consider there to be any essential separation between what is undertaken here (in writing) and the associated practical work forming its immediate background.¹⁶³ The latter activity has frequently involved collaborations to create jointly-authored interactive media installations and performance-events.¹⁶⁴ The basic idea is that I am not trying to write *about* (represent) individual artworks; rather, I am attempting to write *through* a practice of making. I

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have written elsewhere about the relationship (following Peckham) between “activities of explanation” and “activities of experimentation” operating something like a feedback relationship.¹⁶⁵ Rather than seeing writing and making interactive environments as distinctly separate and independent activities, I prefer to look on them instead as contrasting aspects or phases of a single activity.

I also stated in Chapter I that I want to understand how coming technologies such as those entailing digital computers contribute to the manner of their development. I prefer not to have to bring in or invent new or additional forms of grammatical subjects or “trans-empirical” (i.e., non-sensible) connective material, since doing so would only repeat exactly the situation I am trying to undo. Hence, it is crucial for my purposes that I go beyond skin-bound notions entailing the experience *of* a psychological subject that is treated as necessarily or even especially constitutive of what happens. If a word like “experience” remains useful, it is in view of the fact that it includes both how participants act and are acted upon. This is important for proposing an enlarged view of agency that is neither exclusive nor yet compounded, but partial and contingent. A full view means also that one leave open the possibility of an ontologically undetermined component due not only to the epistemological limitations placed on it by perception.

The elements of an interactive system, on the one hand, may be easily understood from the functional view of analysis such that a system designer might take, that is as separate nodes or “black boxes” connected together in a physical or logical network and that communicate via logically arranged inputs and outputs governed by protocols. During early stages of development, what holds a working configuration of software and hardware components together as a framework may be largely a matter of locally negotiated requirements in combination with accepted best practices (i.e., software engineering). Further down, below project-specific criteria, there may be many layers of deeply sedimented practices concretely bound in material substrates, supplied by various industries responsible for related component parts, and produced according to industry-wide standards pertaining to the formatting and transmission of data between interconnected devices.

However, each specified arrangement indicated by named participants, hardware units and software programs suggests more than a set of minimum equipment needed. What is neglected in the simple functionalist account has to do with whole-part relationships full discussion of which

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would lead us well beyond the point at issue. For my purpose here, it is enough to say that the designers of responsive environments must strive at all times to work within a *whole* system. That is, each successive iteration or partial instance prescribes an entire apparatus complete with a human in the loop, often initially the designers themselves. This is crucial, for it is only when a working framework is brought together with extrinsic and highly variable elements (say, particular gestural data input and particular media display output) and taken together as a whole configuration of human-machine-environment that the entirety of means is brought about.

Certainly not all of the particular ways the attributes of an interactive system can functionally interact (especially when it includes something as complex as a person) can be fully anticipated in advance by the designer. Nonetheless, crucial interactions must already at least be generally supported if the main effect is to be brought about. What is at issue, then, is a question of agency. The question asked is, How are the *interests* of the designer implicated in the activity and also in what follows as a result or its effect?

During early stages, something every designer really has to start with in regard to choice of tools is the specific advantage each offers for immediate use. In deciding between familiar and unfamiliar tools, one has to take into account a number of practical considerations. For instance, a particular tool's distinctive advantage may not be fully appreciable until it has been put to maximum effect, through experience. Hence, one must strike a balance between the time it takes to learn a new tool and how long it would take to achieve the task with an existing tool with which one is already familiar. In anticipation of events which are likely to be of importance for the future, the predisposition toward provisioning is to be kept apart from that which is concerned with upholding a present state of the art.

When a tool called for is not available or easily obtained, one finds one has both the practical necessity and the means by which to try to invent it. Very often new ways of doing things get set into motion initially in response to feedback related to an existing way of carrying out a particular task or function. A newly introduced technique may become stabilized and improved upon as a tool useful for routinely bringing off an effect. If an innovation stabilized for technical use in one area is seen to offer added value in another, it may be brought in and put to work alongside another piece of equipment or in its place. The newly introduced equipment is properly viewed not so

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much as new as renewed by fresh application.

If the resulting combination is judged to be beneficial, the two may continue to grow in that place, becoming more elaborate together. Where the innovation is judged to be inadequate in regard to what else is deemed possible, additional modifications may be suggested. Dependencies may be introduced which narrow possibilities at the same time as they enable new ones. If resistance is forceful enough, it may be necessary to reexamine one or more main advantages. In a similar fashion if the scope of activity changes, further modifications may be introduced, or indeed, it may be suggested that some feature ought to be gotten rid of or replaced with something else entirely. To ensure that a particular advantage can be called upon when needed, it must be tested and tested often, in many and different kinds of situations. Quite sophisticated apparatuses may develop in this way, gradually, from the combination and elaboration of many such contrivances having been brought together for the purpose of performing some greater undertaking.

It is always appropriate to ask whose interests an undertaking serves. In the domain of interactive art, a prevalently held view is that interactivity requires response on both sides of the traditional gap between the art object and the art perceiver, thus creating a situation where the art perceiver is held to be an active *participant* in what happens and, in a certain sense, responsible for the aesthetic experience itself. It is this emphasis on shared or joint control of experience that is often said to make an interactive artwork unlike an artwork that just happens to be interactive.¹⁶⁶ As computing is made increasingly to appear everywhere and anywhere, the question of participation (or not) increasingly becomes an urgent one.

The word “participation” is frequently invoked in connection with interactive art, in regard to both the rhetoric and the doing. The widespread appeal of participatory approaches for design generally rests on two main sorts of claims. The first claim made is indicated by the assertion that participatory approaches offer a more egalitarian alternative to top-down decision-making. As a bottom-up strategy, then, participatory approaches claim to better safeguard the interests of those involved. In the case of interactive art, relevant concerns are said to include the interests of the art perceivers as well as, presumably, the interests of the artists themselves.

The second claim is related to the first and more clearly reveals a bias in the direction of administrative interests insofar as it is concerned with the ostensible validity obtained by means

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of securing of the stakeholder buy-in early in the process and maintaining it over the course of a project's development. Some of the advantages purported in regard to this claim may include shared understanding of objectives, common ownership of realized outcomes, and greater responsibility achieved and continued over subsequent project phases.

Philosopher Brian Massumi has recently urged caution in order to avoid consigning interactive art to crude functionalism. As he puts it, the problem is that:

Despite the term *interactivity*, the emphasis is rarely on the dynamic form of the experience in all its dimensions. It is the form of the technical object that is emphasized, for what it affords. The emphasis is on the perches it offers for relaying from action to reaction and back again. It is supposed to be all about social relation, but the dynamic form of the experience tends to get reduced to the instrumental affordance as concretized in the actual form of the technical object. It gets reified in an objective function. The technical object is action-packed. But the sense of action is constrained, subordinated to functional circuits of action-reaction that are to a large extent predetermined to respond to what are taken to be existing needs or wants.¹⁶⁷ ‘

Massumi is careful (and right) to say that not all interactive art emphasizes its functional aspect over its aesthetic aspect. The situation presents a constant stumbling block which interactive artists and designers must continually struggle to find ways to avoid.¹⁶⁸

Whereas aesthetic objects are obviously not the same as technical objects, in connection with interactive art they clearly share a proximate orbit. Massumi introduces a distinction between *interactivity* as a functional aspect of a technical system and open-ended relational dimension revealed by what else an interactive artwork does or (better) potentially could do. To the word “interactivity,” he gives the meaning “an instrumentally contracted dynamic form that tends to shrink to the parameters of its objectively embodied form.”¹⁶⁹ By “relation,” he refers to “the full spectrum of vitality that the dynamic form really includes, potentially, abstractly self-expressed in its semblance.”¹⁷⁰

Put another way, the relational dimension encompasses the more-beyond (i.e., potentially or abstractly) that an interactive artwork could do apart from its strictly instrumental ends. Massumi

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argues that interactive art backgrounds its aesthetic dimension to a significant extent when it emphasizes the functional aspect of its mode of production at the expense of its “aesthetic effect,”¹⁷¹ namely what he calls “semblant expression.” He suggests that the originality and force of the dynamic form of an interaction are more strongly felt when, paradoxically, its “action-reaction circuits” are deferred temporarily, if not indefinitely.¹⁷²

What I take Massumi to mean is that in an interactive art situation there is a tendency of one response to predominate over other responses that are also inferred to be possible. As an exploratory situation, an interactive artwork can be likened to a psychological lab experiment designed to heighten responsiveness to a selected configuration of the environment, in this case, a particular selection of human-machine-environment. Such selections are never neutral, and it is for this reason, as Massumi himself puts it: “You have to have ways [in addition] of evaluating what modes of experience it produces, what forms of life those modes of experience might develop into, and what regimes of power might arise from those developments.”¹⁷³

At the same time, one ought not ignore the fact that, frequently, a range or variety of responses can be observed, even if some of them are not observed very often or perhaps even only once. It seems not unreasonable to suggest, therefore, that the tendency toward a single response is not what an interactive work locates but is rather the condition that makes interactivity possible. Crucially, for purposes of evaluation, it is not sufficient to observe only the dominant or more frequent response; instead one must strive to recognize the more-beyond it encompasses besides.

Are there steps artists can take in order to circumvent the trap seemingly set out for them by interactive art’s close connection with technology and new technology development? Are there appropriate techniques that one can employ directly to increase the likelihood of the emergence of new forms of interactivity and, at the same time, provide suitable vantage points for informing speculative development of underlying technologies? As a starting point, Massumi suggests that interactive art take the *situation* as its intrinsic subject matter. In his words:

What interactive art can do, what its strength is in my opinion, is to take the *situation* as its ‘object.’ Not a function, not a use, not a need, not a behavior, exploratory or otherwise, not an action-reaction. But a situation, with its own little ocean of complexity. It can take a situation and ‘open’ the interactions it affords. The question for interac-

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tive art is, How do you cleave an interaction asunder? Setting up an interaction is easy.

We have any number of templates for that. But how do you set it up so you sunder it, dynamically smudge it, so that the relational potential it tends-toward appears?¹⁷⁴

No doubt, as Massumi's ensuing discussion implies, interactive art can and does wear out for us when it becomes too predictable, or more cautiously, when it fails to provide sufficient perceptual discontinuity. I want to come back to discuss the latter point later on. For now, it is sufficient to offer a negative example, for instance when the predominant interaction offered is too game-like (either explicitly or implicitly), since the participant in an art situation is not likely to be interested in playing a video game or solving a puzzle. The point is not that there cannot be artistic games, but that game-like experiences typically foreground their rule-following attribute. An artful game is one in which the object of the game is to figure out the rules and, if possible, turn the tables on one's opponent; satisfaction comes from beating the game. However the game metaphor is thus limited. When the game's up, one cannot continue, whereas some art only seems to become more compelling the more time you spend with it.

Working from Massumi's suggestion that one ought to take the situation, instead, as the object of artistic behavior, the question becomes: What is the behavior of the artist such that one may say whether the activity, i.e., artistic interest, is successful? We may look at what the artist does in terms of contestation; namely, the role of the artist is to work against the structures of control indicated by the word "function," itself a construct of interactional behavior. One may suppose, then, that artistic interests are truly satisfied only when the functional aspect of the apparatus is undermined and abandoned.

One way to open up the situation, as Peckham observed from the history of scientific instruments, is to "randomize"¹⁷⁵ response behavior, that is to exploit the semiotic additional generated by the designed apparatus so as to undermine the normative and fictive determination of response by producing more data (that is, what human beings do) than the current theory, or what he calls "situational construct," is capable of subsuming and upon which continued smooth interactional behavior depends. It is important to recall that Peckham insisted that all semiotic response, verbal and non-verbal, is interpretational response, which, for him, is situation (or environment) interpreted by interests.¹⁷⁶

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Since Peckham discussed his situational approach to interpretation elsewhere, in addition to relevant discussion found in *Explanation and Power*, I rely on materials from two additional essays “The Problem of Interpretation” (1978) and a later uncollected essay titled “Documents” (1986) in order to draw out relevant aspects of his conception. First, the example Peckham gives of a kind of interpretational activity that happens all the time: A customer walks into a restaurant, say, and orders a cup of coffee from the waiter.¹⁷⁷ The waiter brings it to him. What has happened? What, then, is the intention or the interest of the waiter?

To put it another way, “What is the waiter’s behavior such that the customer judges the waiter’s response appropriate to the customer’s request?”¹⁷⁸ The waiter could bring the customer an iced Pepsi instead; or, if the restaurant is in Montreal and the Canadiens are playing, he could go off to watch the game on the restaurant’s TV. But he does neither. Suppose the waiter and customer are both hockey fans and bump into each other at Bell Centre on game night. Should the customer be so bold as to ask the waiter for a cup of coffee, it is unlikely he would get it. On the other hand, the waiter might reply, “Would you like the usual two sugars and extra cream?” and then get up to buy a cup and take it to him. But suppose, back at the restaurant, the waiter replies that all the services staff are staging a three-hour walkout from their jobs because after one year of negotiations they still do not have a contract.

The context of the situation clearly matters, as Peckham makes plain in his example of the waiter’s interpretation of the customer’s request. He points out also that, taken in reverse, the situation of the customer is culturally and contextually bound in a similar way. The totality of extra-linguistic factors connected to the waiter’s behavior is, theoretically, as wide as the cosmos. The inherent contradiction¹⁷⁹ he sees is this:

On the one hand, situational thinkings seeks to interpret and explain a phenomenon, natural object or document, in terms of the factors associated with it and, perhaps, responsible for it. On the other hand, since the situation is by definition theoretically unlimited, the selection of those factors must be accomplished by the imposition of a construct not derived from the situation, a construct that must be the product of what we call, too carelessly and too optimistically, the reason.¹⁸⁰

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When we ask about the intention or interest of the waiter that controls the waiter's interpretation, we are asking what matrix is appropriate for controlling our interpretation.¹⁸¹ What the waiter does is to "perceptually disengage an analogically determined recurrent semiotic pattern from an analogically determined series of semiotic matrices."¹⁸² Just asking the question is already to engage in interpretational, that is explanatory, behavior; from that point it is interpretation all the way down.

Not only does Peckham contend that interpretation is hierarchical, he asserts that all interpretation is *historical*. In regard to Peckham's performative conception of history, it is necessary to note that, in his view, history is not about events of the past; it is mainly about documents and occasionally artifacts. Peckham proposed that "[t]here are only human beings behaving, and when we are attempting to understand a situation of the past, we are in fact endeavoring to grasp the interactional character of the people living at that time and place, their interaction with each other and with their physical environment."¹⁸³ He held that "anthropology, psychology, sociology are merely three different ways of organizing the same data, that is what human beings do, human behavior. Or as I would put, they are three different ways of explaining the same data."¹⁸⁴ Concerning the attempts at understanding this data, he held the neglected field of cultural history, or what he called *situational interpretation* has at least as solid a basis¹⁸⁵ as science.

Peckam's argument is complex, but with his view of ordinary interpretation in mind, the following passage summarizes the main points and shows the continuity between ordinary interpretation and refined modes of what he calls situational, or, historical interpretation:

What is ordinarily called "historical interpretation" in the hermeneutics of literary and other research amounts to the chronological arrangement of a series of documents (and sometimes artifacts, as in archaeological and paleontological research). Ordinary interpretation is obviously the model for the historical interpretation of documents and artifacts, but there is a profound difference between the two; in the latter the documents and artifacts are coexistent with the interpreter. On the other hand, the historical hermeneutist controls his ordering of his documents and artifacts by such words as "time" and "history"; and he controls his selection of those documents by an ideology derived from his encounters with other documents and artifacts and, above all, from

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his encounters with the tradition of such selection as interpreted from the documentary discourses of his predecessors. Thus, though his ordering and selection of documents and his examination of them differs from the behavior of the waiter (since the waiter's pattern and matrices have ceased to exist), his interpretation of them is identical with the waiter's, for it is dependent upon his previous interpretations of patterns and matrices (analogically determined), and these are interpretations which no longer exist. All interpretation, then, is response transfer from no longer existing pattern-matrix complexes. *Uncertainty is the condition of interpretation and, therefore, the condition of semiotic transformation—the condition, that is, of behavior itself.*¹⁸⁶

Faced with such uncertainty, Peckham suggested, what the historian does is to build up a construct of the situation that they use to “predict where they will find further documents and artifacts, and that their interpretations of the documents they started with will be consistent with the interpretations of the new documents and artifacts.”¹⁸⁷ In short, he proposed that “history” is an ongoing dialectical interaction between existing constructions and encounters with new information entailing the reexamination of familiar ones. An existing construction remains stable only so long as interactional behavior continues without difficulty, that is, so long as predictions continue to reveal new information such that the main contention remains untested. It is for this reason, seemingly paradoxically, that Peckham says:

[A]s stabilization increases so does uncertainty for whatever the initial effect of stabilization may be in stimulating the reinterpretation of existing documents, its ultimate effect is to reduce the effectiveness of the dialectical interaction between documents and situational construct.¹⁸⁸

The situational construct created by the historian is necessarily removed from documents, whereas the authored work is an immediate response to the situation. The historiographical account of that situation is mediated by other factors. On the other hand, the work itself is mediated; the work is the result of a semiotic transformation of a situation.¹⁸⁹ In this regard, according to Peckham, the author is in essence no different from the historian. “[W]e may say that . . . historiographical activity is successful only if the explanatory ideology is undermined and abandoned.”¹⁹⁰

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Whether this is what most historians actually think it is they are doing is debatable; still, the idea has possibilities.

It is time now to turn to Peckham's notion of "discontinuity" in art. This means, to start with, returning again to examine the notion of form, for Peckham reasoned that "[I]f disorientation is present in the perceiver's role, and therefore the artist's, which is dependent upon and derived from the perceiver's, its source must be found elsewhere than in the semantic aspect."¹⁹¹ He concluded the only other possibility is art's formal aspect. As Peckham himself pointed out, the word "form" as it has been used in discussion with the arts has too many varied associations; for this reason, it is important to begin with specific statements in order to make sense of what Peckham is referring to when he uses a word like form in connection with works of art and behavior.¹⁹²

Peckham stated his definition of a work of art in different ways in *Man's Rage from Chaos*, each of which serves to further clarify or modify aspects of his conceptualization. Here are some representative passages taken in the order of their appearance and logical development:

*A work of art . . . is any artifact in the presence of which we play a particular social role, a culturally transmitted combination of patterns of behavior.*¹⁹³

*A work of art is what the perceiver observes in what has been culturally established as a perceiver's space.*¹⁹⁴

*A work of art is . . . an occasion for a human being to perform the art-perceiving role in the artistic situation, that is, on the artistic stage.*¹⁹⁵

Peckham's final analysis, a work of art is "*any perceptual field which an individual uses as an occasion for performing the role of art perceiver.*"¹⁹⁶

Having observed that "actual [aesthetic] experience . . . is characterized by a discontinuity of experiential process,"¹⁹⁷ Peckham proposed "the categorical reference of artistic form is not to a range of configurations perceived in the artistic field, but to a range of expectations . . . in the perceptual set or orientation."¹⁹⁸ In other words, the perceiver's expectation determines what it is, that is, what the situation calls for. This is not an extreme form of philosophical idealism; he explicitly acknowledges in many places the constructive role of the environment in shaping the perceiver's immediate experience, and the role of experience in shaping perception.¹⁹⁹ In *Man's*

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Rage For Chaos, for instance, Peckham proceeds through a far-ranging examination of actual behavior of art producers and perceivers, drawing on early cognitive science and many examples from the rich history of art to elucidate his points and draw out their implications.

Dissatisfied with traditional accounts of style, in *Man's Rage for Chaos* Peckham needed to be able to account for what he termed the “nonfunctional stylistic dynamism” historically apparent in formal works of art. “Nonfunctional stylistic dynamism” refers to the buildup of external discontinuities during a stylistic period observable in actual materials (documents and artifacts) produced and retained from the past and traditionally adjudged to be “art,” leading to the point today when nearly anything can be responded to as a work of art. An external discontinuity is the consequence of successive attempts to stabilize the discontinuities effected in individual works: “External discontinuity refers to the discontinuous relation between a work of art and its predecessors in the same category.²⁰⁰” Indeed, Peckham held that it was not possible to define art on the basis of what works of art have in common. Instead, he argued that not order but disorder, or “stylistic dynamism,” is what crucially distinguishes art (as an activity) and artistic experience from other modes of human behavior. Indeed, Peckham held that “not art but perception is ordered.”²⁰¹ In brief, “art is a disjunctive category, established by convention, and that art is not a category of perceptual fields, but of [social] role-playing.”

To help with the problem of stylistic dynamism, Peckham draws from Jerome Bruner’s important work on categories in learning and development theory, in particular the concept of a “disjunctive category.”²⁰² Peckham’s definition of the disjunctive concept closely follows Bruner’s description. A disjunctive category is one whose membership is not determinable by attributes which members can be said to have in common but is determined entirely by social convention, that is tied to practice and amounting to something like a “decision.”²⁰³ But, first of all, from a given instance, how does one know whether one is faced with a member of a disjunctive category? When one realizes that one may be confronted with a disjunctive category, are there appropriate strategies for dealing with it? As Bruner put it:

What makes a class disjunctive is the *manner* in which one can use the defining attributes of objects to determine whether or not they are indeed members of the class
[...] Members of a disjunctive class exhibit defining attributes such that one *or* an-

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other of these attributes can be used in identifying or categorizing them.²⁰⁴

It turns out that human beings face a number of challenges when confronted with a member of a disjunctive category, in particular one in which they do not have any specific prior knowledge, and when there are no members of the community around to ask who know that such a category exists and can say that a particular object has been placed in that category.²⁰⁵ This is because even a positive instance does not by itself locate defining attributes. “[K]nowing that a particular instance exemplifies a disjunctive class does not have the same predictive value as knowing that it belongs to a conjunctive class.”²⁰⁶

In practice, we seem predisposed from the outset to prefer conjunctive categories derived from attributes held in common.²⁰⁷ It certainly takes less effort. In other words, since when dealing with a disjunctive category one cannot rely on features which can be had in common, the usual methods of direct testing of the relevance of specific attributes are inadequate. Instead, a disjunctive concept requires reasoning from the “other,” that is, inferring membership not on the basis of what an instance holds in common, but by what is different. To “know” what a disjunctive class is like, we must begin with what the class is not like.

Peckham offered a practical test for determining if an object in question is an instance of the disjunctive category labeled “art.” Such a test might be very useful, for instance, if we are interested to know if a given document or artifact was a work of art for the culture from which it came when there is no one around to whom one can pose the question directly. Briefly,

*Any object (or perceptual field) from any culture, may . . . be properly categorized as having been the occasion for artistic perception if a chronologically arranged sequence of such objects shows both functional identity and non-functional stylistic dynamism.*²⁰⁸

Utilizing the model of a stylistic continuum preferred by archaeologists and anthropologists, Peckham proposed that a work of art can be recognized by placing it in a chronologically arranged series of objects of the same or similar function, and then showing whether it exhibits an instability which is not governed by the function of the object in question.²⁰⁹ “A work of art cannot be

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identified in isolation . . . but only as one of a horizontal series of objects of functionally identical objects which, as a series, shows non-functional stylistic dynamism.”²¹⁰

By observing non-functional stylistic variability, some objects in the series may show more or less dynamism. Objects that still exhibit no functional identity may still have functional identities as art objects; that is, they serve as opportunities for playing the role of art perceiver, for which any object (theoretically) can serve. Peckham also suggested that a series of works of art from different cultural levels will also exhibit functional interference—the higher the cultural level involved, the greater the disruption will be. He called this second type of external discontinuity exhibited by art “non-functional stylistic emergence.”

Peckham had been telling his students that what emergent art offered their perceivers is perceptual discontinuity, that is, violations of the perceptual expectations for a particular series of functionally identical objects.²¹¹ However, he maintained that external discontinuity is less significant than perceptual discontinuities found within a work of art.²¹² This is because the accumulation of discontinuities observable (historically and culturally) is dependent on the discontinuities present within individual works of art. Initially in *Man's Rage For Chaos*, he proposed three types of formal discontinuity relevant to art works.²¹³ These were “implicit discontinuity,” “internal discontinuity,” and “modal discontinuity.”²¹⁴ Later on, Peckham extended his notion of discontinuity to also include “semantic discontinuity” such as that found in fiction, thus weakening his earlier distinction between formal and semantic aspects of art.²¹⁵

Notably, Peckham’s emphasis on discontinuity was in stark contrast to the then common emphasis from nearly all the distributors and interpreters of art who instead emphasized art’s “organic unity” and “significant form,” a viewpoint that Peckham himself equated with a quasi-religious attitude.²¹⁶

Moreover, the perceiver’s “rage for order” actively interposes itself between him and much of the sensed field (whether of nature or of art) that is potentially there to be seen—and which it may be vitally important *to see*.²¹⁷

Peckham passionately promoted instead, what he said the people really want, is disorder. What art provides, he said, is “the violation of expectancy, or the failure of predictability; and requires,

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for adequate response, a toleration of uncertainty in categorization, or sustained problem exposure.”²¹⁸ In other words, art exploits the instability²¹⁹ inherent in analogical thinking. This notion of art is important in connection with activities of explanation, for the reason that:

The basic scientific sentence is, “If you do so and so, then such and such will happen.” And that sentence is the basic sentence of all our instructions for interacting with the non-verbal, for it is the only way the inadequacy of the verbal instructions, or scientific theory can be uncovered, located, and corrected. It seems clear to me that the historical-philological interpretation of literature is, like science, based upon the norm of interpretation, and that both are culturally convergent, emerging from the matrix of situational thinking.²²⁰

To the extent that the aim of science is to search out the simplest explanation that can be reconciled with our experiences, what art offers, in addition, are new forms of thinking and feeling. On the other hand, Peckham wanted us to get so good at playing the role of art perceiver that we did not have to. Perhaps that is too optimistic. For, art is mostly “trivial,” as Peckham said; that is, it is a great place to take a vacation but a terrible place to live. If we are to continue to make a home in this world, then art is better viewed as preparation for serious innovation, namely, so that a genuine alternative may emerge.

Chapter V

Conclusion

We are *condemned* to innovation, we are *condemned* to creativity, because, as I say, nobody ever gets anything right.²²¹ (a.k.a. “Peckham’s Law”)

In this thesis, I have been concerned with one issue, specifically, the possibility of a new idea coming out of practice. Or, even more relevant to my project, How can a philosophy of experience contribute to a practice making responsive environments? For this project, my theoretical mentor and guide has been the late pragmatist, cultural historian, and critic Morse Peckham. Indeed, I think Peckham’s crucial insights into the relation of the arts and behavior have been lost to students of interactive art and media today, who frequently view formal (conventional and habitual) concerns as something to eschew, just as, in doing so, they risk locking themselves into producing more of the same. This suggests also the importance for artists to know the history and theory of the ideas they promulgate, in order that a genuinely new way to go may appear.

Even though this is not a thesis about Peckham, it has been very much entangled with the ideas of this stimulating and provocative thinker. Whatever else he may have done in his career, he wrote a lot. For reasons of space and time, I have not attempted to supply an exhaustive account of his writings and ideas. That is mainly a pedagogical concern. Instead I have only attempted to provide a limited introduction to his main ideas in the hope of demonstrating his continuing relevance. If not, the reader at least may follow the notes in order to examine the originals and make up their

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own mind.

Peckham definitely believed some ideas are better (more useful) than others. His later writings, beginning in the early 1970s, demonstrate a willful rejection of traditionally appropriate subjects for traditional academic scholarship (founded in disciplines). Instead he favored undermining those cultural instructions for performance which he judged to be unavailing, in particular in connection with immediate social concerns. In this way, by deliberately seeking out and casting off worn-out ideas that are presently exerting the greatest influence, we may gradually learn to respond to changing conditions (social, mental, environmental) and modify, frequently for the better, the dominant culture to our advantage. As he finally put it in the end, the Readiness is all.²²²

The first chapter sets forth the initial problem of non-personal experience, that is, experience as the experience of a “subject.” In order to consider an alternative, I began with the pure experience (in the manner of William James) and radical empiricism and showed how Peckham’s account of meaning-as-response follows from it. In short, meaning is something we add to events in lieu of a direct connection to them.

Throughout this long essay I have implicitly drawn on my own interests and experiences making computational responsive environments. In carrying out these interactive works, which are conceived as experiments, I aim at producing new forms of thought and feeling.²²³ This is also in view of the fact that no enterprising maker that I know is truly satisfied with what is merely new to them; rather, what every maker wants is, in fact, a new situation. A new situation is crucial for moving forward, since it is only in new and different kinds of situations that our ideas are definitely tested.

I have in mind here, too, something that American critic and fiction author Samuel Delany said in regards to the role of speculation in connection with types of social activism. In an interview, he said science fiction (or speculative fiction, my preferred term) is not just imagining the world as it actually is, it is also thinking about what else that world can do, how else it might be. This is in view of the fact that, if we’re going to change the world we live in, we have to *learn* how to think about a world that works differently.²²⁴

Peckham is clear about what he is after concerning function of art in connection theory of biological development. To put it in the form of a question, Why should artists take the trouble

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to do it? Indeed, in his words, most art is “trivial.” Statements such as this may seem flippant, in particular, taken out of context. But in fact they belie an earnest attempt to grapple with one of the central problems facing contemporary arts in the twentieth century, and I would add the twenty-first century. It seems unreasonable that art should wear out for us, yet it does. If any problem qualifies as *the* problem of art in the current era of hyper-innovation and commodification, it is this one.²²⁵ This is in view of that fact that Peckham conceived of art as preparation for serious innovation in which vital interests may be at stake. It is crucial in his view, for continuation of the species, that we are able to learn to recognize when we are dealing with a new/changed situation (new possibilities) in order that we may turn it to our advantage, rather than be controlled by it.

Delany, for his part, is not particularly interested in changing the world through his art; that’s just not what he thinks the function of art is. His post-romantic standpoint (and, similarly, Peckham’s) is best understood when we reject the idea that art is redemptive. Speculative fiction is but one mode that announces itself as fiction. A theoretical benefit of fictive modes of behavior is that virtually *any* idea can be safely examined from a position of relative impunity.

The latter point may not be all that important. More significantly, once secure in this position, we can *choose* to take greater risks than we might otherwise have done, *in order to learn from them*. Another clear advantage for fiction writers is that, for overcoming barriers to entry and transmission, *beginning presentations need only be at least interesting enough to want to read*. And that is either a good thing or a bad thing, depending on your point of view.

What, then, constitutes a new situation for interactive art? When you get right down to it, this is a question about the content of concepts, or ideas. Interactive art is certainly by no means unique in its view that participant-viewers are fundamentally necessary to complete works. It does, however, perhaps more plainly and readily than other genres of digital media today, openly announce participation as a primary functional concern. Such thinking may be due to a long-standing division of labor between artistic producers (the artists) and consumers (audiences). However, increasingly, as audiences are called on to take part in and complete all sorts of interactions—not only those involved in computer art works, but others entailing a wide range of everyday life experience as well—the distinction becomes a central problematic.

I think it matters in which way we approach development of new technologies in connection

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with matters of vital interest. I, for one, think we should resist what I called in Chapter III “technological solutionism,” that is, the view that technology is primarily about solving problems. As Peckham points out in many places, solutions are always tentative. This is because the solutions developed in response to previously encountered difficulties are never completely adequate to a new situation, which now includes the solution developed as an addition. Behaviorally speaking, an attitude oriented towards solutions can only anticipate more problems.

So, how do we deal with this situation? In contrast to a solution-oriented approach, I try to think of making responsive environments as a type of question-seeking activity. Briefly put, What is *necessary* so that a genuine option (selection) can emerge? For a start, I think there is an important distinction to be marked between undertakings that are oriented towards technology primarily as a source of potential solutions and enterprises which actively engage with coming technologies in order to see what else they can do, that is, that speculate *technically*. Many problems arise when we ignore this distinction, thus neglecting the latter.

As a beginning step, and for understanding existing interactive art works as well for conceiving new ones, I think we would do well by asking what kind of participant a given work anticipates. In this way, by conceptualizing human computer interaction in terms of response and behavior (following Peckham), I think we can get further in our effort to set up responsive environments on a firm basis for learning. Peckham provides a *tool*, for those who have learned how to use it, which can be applied to exploit the inherent instability entailed in the process of setting up interactive environments (among many other things), in particular during beginning and ideation phases.

A tool is not a method. This needs to be underscored since the application of a tool does not guarantee success. Further adjustments may be needed. Indeed, Peckham looked forward to the potential for his own theory to be modified, if not overturned, if called for; it remains to be tested. Of course, any further modifications, whether planned or inadvertent, that I may have introduced along the way are undoubtedly the product of my own interests.

It is worth pausing to look back at a few additional questions, issues, and points of tension that have been raised in the preceding chapters, primarily about affect, randomization of behavior, and “decisions” that arise in arts practice. In conclusion, I make a suggestion for a possible way forward.

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First, I tend to think of what is frequently called “creativity” (though here we might say research-creation) as a local process distributed amongst heterogeneous (transactional or transindividual) actors rather than as an unobservable cognitive process walled up within an “author” that can only be stimulated by the environment. Peckham’s own account of art as behavior certainly admits to the capacity of human beings to make choices in connection with the work that results. More importantly, it admits to important *emergent* as well as situational factors²²⁶ for affecting behavior.

Admitting to the role of human agency is not a particularly daring idea in itself, although it frequently figures as the elephant in the room in current post-human debates. What other vocabulary can we employ that deals with questions of agency — including not only humans but also non-human agencies, such as machines as well as the impersonal repeating forces in culture. Are there alternative ways (perhaps better ones) of conceptualizing habit and convention (normative aspect) than by reliance only on anthropic principles for understanding? In other words, are we better off bypassing Peckham’s emphasis on (dynamic) human behavior and going directly to affect?

Clearly we need a situated account of how affect *gets in* to the arts and technology development, that is the “decisions” (a metaphor) that arise out of the interaction of heterogenous (transactional or transindividual) forces, that is, human, non-human, and more-than-human. In recent decades there has been a resurgence of interest in affect, crossing the humanities and social sciences, and informed by recent neuroscientific insights and analogies, that places emphasis on bodily experience.²²⁷ Indeed, a capacity for response is presumed for something to rise to the level of attention and awareness. It is widely agreed that this capacity has a physical basis.

In Peckhamian terms, affect is closely associated with bodily sensation prior to its appearance (use) as a sign. As he explains, what is first felt to be discontinuous from experience is not initially perceived as a sign, but nonetheless it is transformed into a sign through something like a learning process. He says this happens through successive and aggressive acts of perceptual categorization (judgements) which give it a particular sense of *this-ness*, or more precisely *what’s-it-likeness*. Yet, for him, since no causal relationships can be presumed to exist between stimulus and meaning and behavioral response, human perceptions of meaning are not reactive (automatic or instinctual), but largely discretionary.

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As he points out, most of the time what we learn is to ignore information that is perceived (judged) to be irrelevant to our situation. But this does not mean that the initial impulse to movement (response before it becomes a sign) is halted. Rather, instead, it is “randomly” continued (for example, to internal organs as an alternative to skeletal muscles).²²⁸ This is the first type of randomization Peckham considers.

Peckham (following the early American pragmatists) locates subjectivity in the space of randomization between stimulus and behavioral response, the effect of a discontinuity in experience. It is here, in the famous gap between sensory input and motor output, that he situates indeterministic aspect of behavior, in the disjunction between bodily sensation and perceptual judgement. The source of this indeterminism, he says, is the human brain.²²⁹

Indeed, Peckham thought one of the most interesting things about the human brain was its capacity to produce random responses, that is to “lie.”²³⁰ Peckham speculated that this capacity for random or undirected behavior may have conceivably had survival value for human beings. Those best adapted to a given situation would be less likely to pass on genetically transmitted behavior as the situation changed.

Yet the vast majority of human behavior is not random, therefore it must be controlled. This is because behavior, if not controlled, becomes unpredictable. In absences of genetically transmitted controls for behavior, directed behavior must be learned. Semiosis, in other words, was a “counteradaptation”, a response to undirected changes in the environment. Indeed, from the viewpoint of biological adaptation, all human behavior is “maladaptive.”²³¹

Peckham’s discussion indicates a bodily capacity for response that is different from but entailed in acts of perception.²³² The second type of randomization is negation, which Peckham says is unique to verbal behavior, for it does not directly involve or engage the senses. For Peckham (following Hegel) verbal negation entails the construction of another possibility, rather than an opposite. As he puts it “[T]here are no (verbal) negations, only alternatives.”²³³ His form of negation this to be distinguished from simple refusal or avoidance.

Importantly, in view of the fact that non-verbal signs can be treated “as if” they were verbal signs, the fictive aspect of verbal behavior can be extended to include non-verbal behavior as well. This possibility tremendously increases the *range* of modes of available response behaviors that

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can employed for the construction of alternative explanations, justifications, and validations.²³⁴ Whether one regards this as a good thing depends how you look at it. As he puts it: “If the degree of fictiveness is sufficient, we call the result either a lie or an act of the imagination, depending upon whether we are concerned with validating or invalidating it.”²³⁵

For Peckham’s own project concerning explanation and its place in relation to the rest of human behavior, it is clear where he had to begin, that is with human verbal behavior. It is in view of this, I think, if we are going to establish a *theory* of affect ultimately useful for guiding subsequent developments arts and technology, then we cannot overlook his argument concerning the relation of verbal and nonverbal (gestural) behavior. In short, verbal behavior subsumes non-verbal behavior.

In order to get a grip on development in terms of dynamic (randomized) activity, an approach that does not limit us simply, in linear fashion, to what follows from what. Rather than argue for specific solutions to the issues raised, this thesis as been an attempt to supply an orientation useful for considerations of the relation of art and technology development. In this way, by positioning ourselves in the middle, focused on emergent as well as situational factors, rich new forms of thinking and feeling might arise that stand in contrast to the prevalent ideology of “solutions,” and relate to a wider array of activities drawing from everyday living as well. Towards this aim, I believe many more experiments are needed. I hope that readers with interests leading in these directions may see the way forward more clearly.

In conclusion, it is perhaps worth noting an approach to research-creation that has seemed at least satisfactory to me for facilitating direct involvement. Start with some situation that interests you enough to want to spend some period of time with. This initial choice is important because what follows frequently involves considerable uncertainty and risk. Next, involve yourself openly with the issues coming out of it. As an integral part of the inquiry, continually ask, What does it feel like to be situated on the inside (in the loop) of such a process? Continue through until the end, then stop. Finally, looking back at what has been created as an *effect*, then and only then, can you say finally say what problem was all this in response to.

Notes

Chapter I

1. Put in more philosophically inflected language, I want to understand the concrete role of the whole configuration as a “relation” in affecting the process of development (i.e, becoming/change). In this view, a particular groupings of human makers, original technologies, and signs are to be known together entirely by their effects, and not what may be attributed to them individually as a cause.
2. Century 1999, 3.
3. Century’s definition of a studio-lab is surely broader than this and extends to include *any* arrangement of artist-users and technology designers/researchers, not only those within the university institutional context. His survey extends to include heterogenous stand-alone institutions (public and private), networks, and project-based initiatives, as well.
4. Century’s account echoes Gibbons and colleagues’ depiction of “Mode 2” knowledge production. Gibbons 1994, See, for discussion, Helga. Nowotny, Scott, and Gibbons 2001; Helga Nowotny, Scott, and Gibbons 2003.
5. Century surveys a number of different organizations and structures in his report (not only academic), ranging from research and development laboratories in publicly financed cultural institutions, to art-labs in private sector firms, to university/public sector studio-laboratories, to national and multinational research networks, and to specific targeted research projects.
6. Born and Barry 2010.
7. For discussion of the introduction of the term research-creation and related issues, see, for example, Chapman and Sawchuk 2012.
8. Born and Barry 2010, 104.

9. Morse Peckham's notion of behavioral "feedback" in regards for cultural change may be productively compared with Gregory Bateson's understanding of cybernetics and the notion of the feedback loop. Peckham, in particular, targets the relation between explanation and exemplification (experimentation).

10. Krueger 1977, 423.

11. 430.

12. 424.

13. 430.

14. 430.

15. Krueger 1991a, 1991b.

16. Krueger's term for a "user" of one of his responsive environments is a "participant."

17. Krueger, Hinrichsen, and Gionfriddo 1989.

18. Krueger 1977, 433.

19. For an interesting and relevant discussion contextualizing Krueger's work in connection with historical antecedents as well as subsequent directions, see Salter 2010, 316-320.

20. The paradoxes of Zeno are well known. For a concise summary and some indications of the continuing debate in philosophy, see Huggett 2010.

21. Peckham 1979, 50.

22. *xv-xvi.*

23. *xvii.*

24. *xvi-xvii* (emphasis mine).

25. Peckham 1995f, 228. Peckham's position can be productively compared with analytic philosopher and literary critic Glen Strawson's "realistic monism." One of Strawson's central assumptions is that the experiential (or consciousness, or phenomenology, or feeling, or sensation, or experiential "what-it's-likeness", or experience (Strawson's preferred term)) cannot be reduced to the nonexperiential.

26. Peckham 1979, 100. Peckham attributed the error to namely to Thomas Carlyle and George Herbert Mead.

27. 100.

28. 100 (orig. emphasis).

29. Putnam and Conant 1994, 152.

30. Jay 2005. The appeal to experience is common to early and newer forms of pragmatism, and distinguishes them, too, from the neopragmatists led by Richard Rorty, whose work has sometimes been called "pragmatism without experience." Bernstein 2010, 128.

31. See, for example: Artaud 1958; Barba 1995; Boal 1979; Brook 1968; Grotowski 1970; Schechner and Turner 1985

32. James 2003, 12. James had hoped that his conception would initially serve as a stimulus for "new growths or a nucleus of new crystallization" in psychology, from where he had intended to launch a broader critique of the problem of experience/experimentalism within science.

33. These were collected together along with several others and published in book form in 1912 entitled *Essays in Radical Empiricism*.

34. Fisch, Ketner, and Kloesel 1986, 1951.

35. James 1987, 826.

36. 826.

37. James 2003, 14.

38. Dewey and Bentley 1964.

39. Dewey and Bentley 1949. The late terminological shift reflects in part an effort to establish a more precise language consistent with latest developments of the science of his time.

40. Notably, I have not attempted here to trace the connections between the pragmatist tradition and current approaches to study of mind. Recently, Rockwell (2005) has considered Dewey's "behavioral field" in connection with embodied and dynamical systems approaches found in today's cognitive science.

41. Bentley 1939, (emphasis mine).

42. Dewey 1938, 31.

43. 31.

44. 466.

45. 466-467.

46. Daugherty 2011.

47. Leo Daugherty is Professor Emeritus of Literature and Linguistics at The Evergreen State College. Daugherty currently teaches in the Bachelor of Interdisciplinary Studies Program at the University of Virginia.

48. Interest in the work of the early pragmatists William James and A. N. Whitehead, in particular, has gained renewed attention in recent years. See, for example: Debaise 2007, 2009; Stengers 2008; Serres and Latour 1995; Latour 1999, 2005, 2008. See also the work of the Québec-based political philosophers Brian Massumi and Erin Manning 2002, 2011a; 2009.

49. Continental philosophy of course has its own long traditions and history of contending with experience. Indeed, productive exchanges have long taken place across the Atlantic and fruitfully

continue to do so today. For instance, consider the separate contributions of William James and his contemporary Henri Bergson on experience, and the subsequent treatment of their thought in the discourse. For an early consideration mainly emphasizing respective differences of method, see Kallen 1914. For a recent example emphasizing their intellectual connections, see Ferguson 2006.

50. Salter, Smoak, and Dartel 2012.
51. Barad 2007, 49. The author draws insights from science studies, social and political theory and includes them in her own “agential realist” account.
52. Pickering 2011.
53. I suppose my position is indeterministic, or at least causally indeterministic.

Chapter II

1. I will not be specifically discussing Peckham’s historical work on Romanticism.
2. Deleuze and Guattari 1994, 28.
3. Matalene 1995; Daugherty 1995.
4. Matalene 1984b; Combs 2011.
5. Matalene 1984a; Peckham 1995a.
6. Matalene 1995, *xix*.
7. Daugherty singles out eight essays that serve as an introduction to Peckham’s theory of Romanticism and are helpful for tracing its development in Daugherty 1995, *xii*.
8. Some are more useful than others.
9. Peckham 1995f, 8.
10. 8.

11. Peckham 1979, 273. For further discussion, see 272–273.
12. Peckham 1995f, 8.
13. 8.
14. 8.
15. Peckham 1966.
16. Peckham 1970d, 282–283.
17. Interestingly, Whitehead connected beauty with discord. Cf. Whitehead 1997, 252–264 Indeed, Peckham’s notion of cultural vandalism may be productively considered alongside Whitehead’s notion of creative destruction.
18. See, especially Peckham 1970c, 302.
19. Matalene 1995, 219.
20. See Morris 1970.
21. Peckham 1965, 71.
22. Peckham 1970c, 303–304.
23. Peckham 1965, 314.
24. 314.
25. For an overview of the development of Peckham’s theory of signs, see Matalene 1995, 220–221.
26. Morris was famously accused by Dewey of having crucially misinterpreted Peirce’s notion of *interpretant* (a technical term used by Peirce) and converting it to a person who uses it, thus, providing an impoverished psychological (dyadic) account of Peirce’s original triadic construction. Like Peirce and unlike Ferdinand Saussure, Peckham’s semiotic is triadic. See Dewey 1946. See

Dewey and Bentley 1949, 238–239.

27. Peckham in fact owes much to directly and indirectly to the work of Charles Sanders Peirce, whom he repeatedly mentions with respect. Most of Peirce’s works were published posthumously (he died in 1914). The first volume of collected works did not appear until 1931. Successive volumes continued to be issued until 1958.

28. See Peckham 1995c, 300-301n5.

29. Semiosis, or sign-action, is the true foundation of Peirce’s semiotic.

30. Peckham 1995h, 318.

31. Cf. Mead 1900.

32. Peckham 1995b, 275.

33. It may be tempting to read this passage (as well as remarks made elsewhere) as indicating that Peckham disregards the rhythms and indefinable aspects of what Erin Manning has recently called the “prearticulations of language.” For Manning, this is importantly where “language’s affective tonality comes to expression.” On prearticulation, see, Manning 2009, 216-217. It may be interesting in this context to note that Peckham’s own quest to understand meaning in connection with language began with a frustration with traditional accounts of prosody in traditional English language poetry. More crucially, however, and to avoid confusion, it necessary to view Peckham’s statements in context, underlining the importance he places on the non-immanence of meaning which is explicit in many places in Peckham’s writings, and here, too. Put simply, he is interested in behavior. For Peckham behavior is a wider, and more fundamental notion than linguistics. In his words, verbal behavior is not the same as linguistics, rather it subsumes it.

34. Matalene 1995, 222. I have left the passage intact as originally cited by Matalene, and only corrected the page numbers included.

35. [http://en.wikipedia.org/wiki/Candy_\(Southern_and_Hoffenberg_novel\)](http://en.wikipedia.org/wiki/Candy_(Southern_and_Hoffenberg_novel))

36. Peckham 1969, 14.

37. See Miller vs. California, 413 U.S. 15 (1973) <https://supreme.justia.com/cases/federal/us/413/15/case.html>

38. Peckham 1995e, 253.

39. That human beings can make mistakes and can lie is, perhaps, Peckham held, their only interesting attribute. Peckham 1969, 137.

40. Peckham 1979, *xvi*.

41. In *Word, Meaning, Poem* (1961) Peckham proposed an original diagrammatic technique for interpreting poetry based on what he termed “interpretational hypothesis.”

42. Peckham provided an excellent summary of *Explanation and Power* in the introduction to his third and final edition of collected writings *Romanticism and Ideology*.

43. *Romanticism and Ideology* continues the series of papers published in *The Triumph of Romanticism* (1970) and *Romanticism and Behavior* (1976). The third volume consists of nineteen essays (fourteen of which had been previously published). A number of these date from the same period as the writing of *Explanation and Power* which was completed in 1978 and published in 1979. *Explanation and Power* contains the most complete examination of the key ideas initially set out and continued from these essays.

44. Peckham 1995f, *viii*.

45. 1.

46. 1.

47. 1.

48. See, on lying and imagination Peckham 1979, 109.

49. Daugherty 1995, *xxiii.n3*.

50. As quoted in Combs 2011, 192.

51. Peckham 1970c, 317.

52. Peckham 1979, *xvi*.

53. Peckham’s views on science can be found in two essays: “Romanticism, Science, and Gossip” (1972) and “Literature and Behavior” (1980). Both of these can be found in *Romanticism and Ideology* (1985/1995).

54. Peckham 1970a, 33.

55. 33.

56. 35.

57. 38-39 (emphasis mine).

58. 39. The allusion made is to Walter Pater’s “Conclusion” to *The Renaissance* (1868)

59. Peckham 1979, 143.

60. 39.

61. Peckham’s “situational” “emergent” approach to historical interpretation is discussed further in Chapter IV.

62. 41,45.

63. James 2003, 5.

64. Peckham 1979, 41.

65. Peckham 1970c, 317

66. I give particular attention to terminology developed in his writings from the late 1970s and 1980s which mark his emergence as an original social thinker. I have not attempted to trace the

full development of his terminology; for the most part, instead, I have relied on later presentations drawn especially from *Explanation and Power* (1979) and essays contained in *Romanticism and Ideology* (1985/1995). Peckham helpfully offers definitions of his own calling attention to specific modifications made. Page references to extended citations and discussion are given in the notes.

67. Peckham 1979, 110.

68. Peckham 1977, 805.

69. Peckham 1979, *xiii*.

70. *xiii*.

71. *xiii*.

72. For further discussion, see 37–42.

73. 37.

74. I am grateful to the late Prof. Harry Miller of the University of South Carolina for these additional terms, modified slightly from their original context for usage here.

75. As I said at the beginning of this chapter, it is critical to remember here that I am trying to talk about behavior, and not metaphysics. Indeed, no self-respecting philosopher, at least none that I know, would accept these terms as I have narrowly presented them. I mention these further distinctions in part to suggest that learning-behavior has the nature of a continuum. As a further note, my usage of the word virtuality has nothing to do with computer-generated environments.

76. 56.

77. 56, orig. emphasis.

78. For discussion of Peckham's theory of perception, see Peckham 1965, 209–216.

79. For discussion, see Lazerowitz 2002, 266–270.

80. For discussion, see Peckham 1979, 5–11. Recall Wittgenstein’s examination of the question: “What is left over if I subtract the fact that my arm goes up from the fact that I raise my arm?”

Wittgenstein:2006

81. The study of logic, Peckham held, properly understood belonged to the behavioral science rather than the domain of strictly formal/theoretical sciences. Peckham 1970d, 248.

82. Peckham 1979, 57.

83. 48–49 (emphasis mine).

84. 11.

85. 110.

86. To paraphrase Dewey somewhat, ends in view are means to even further ends.

87. 70.

88. Peckham 1995f, 2.

89. Peckham 1979, 70 (orig. emphasis). Fictive is consistent with performative in

90. 97.

91. 98.

92. The difference between Peckham and the earlier pragmatists is outlined in Chapter 1. There I indicated that the move to characterize the human organism’s relation to the world as a semiotic transaction and not merely a relational transaction is a strategic one for Peckham in that without the argument for continuity grounded in the reality of experienced semiotic relations neither his radical theory of meaning(-as-response) nor his general theory of human behavior would have made any sense.

93. 100.

94. Certainly structural similarities can be seen between Peckham's position and those of the existential phenomenologists. Readings that lead in this direction should be careful to emphasize behavioral aspects. Recently Frank Chouraqui has for example suggestively argued that Merleau-Ponty's "perspectivism" should be read in the context of an existential reduction seen as activity. See, for discussion, Chouraqui 2014, 168-173.

95. For discussion, see Peckham 1979, 116–118.

96. *xiv*.

97. 139 (orig. emphasis)

98. Peckham and Chatman 1961, 1.

99. My remark here is intended to be playful rather than to suggest a lack of seriousness. Rather more seriously, Peckham's ideas, remarked in Chapter II, would suggest that language in its ordinary usage is best seen to be fully continuous with sophisticated usages, including sophisticated metaphysics. Indeed, this is something that students just starting out have to come to terms with eventually, in particular if they are going to begin making productive use of the complex aspects of the thought of an advanced philosopher like Whitehead. Certainly normative definitions such as those recorded in dictionaries are only a starting point.

100. Lindberg and Stevenson 2010.

101. Rittel and Webber 1973; Ackoff 1974; Law 2004; Austen 2010; Levin et al. 2012.

102. Peckham 1995f, 6.

103. Deleuze 1992.

104. For discussion, see Smoak 2011, 139-140.

105. Smoak 2011. Included as Appendix D.

106. Peckham 1979, 3-10, 11-15, 61.

107. A similar independently arrived at point is made in Morozov 2013 in connection with what the author dubs “technological solutionism.”

108. These issues were raised in recent discussions surrounding the *Archaeology of the Digital* exhibition at the Canadian Centre for Architecture, part of a multi-year research project initiated by the CCA to investigate the development and use of computational technologies in architecture. Lynn et al. 2013, See Exhibition information available at <http://www.cca.qc.ca/en/exhibitions/1964-archaeology-of-the-digital>

109. \Cite[For discussion of the function of art as “trivia,” see][74–75, 253]{Peckham:1969}

110. Peckham 1979, 96.

111. 96.

112. See, for discussion, 245.

113. 97.

114. 97.

115. 97.

116. Bogen 2014.

117. Peckham 1965, 89–90.

118. Peckham 1979, 92.

119. 94.

120. 94.

121. 96.

122. Already the theory of perception found in *Man’s Rage for Chaos* might be looked on as a prototype for a thorough-going behavioral account of (affective) cultural dynamics, such as the

one presented in *Explanation and Power*.

123. Peckham 1979, 98, orig. emphasis.

124. 60, 70, 98, 109. Peckham dubbed his own position “semiotic phenomenism,” the conception of an organism’s link to the world is a relational semiotic transaction, namely the conversion of behavior into performance by means of semiotic transformation. See Peckham 1995f, 228.

125. 31.

126. Peirce 1868. Peirce develops “intuition” as a technical term to indicate a type of “cognition not determined by a previous cognition of the same object.” Notably here and elsewhere in Peirce’s view cognitions or what he calls “thought-signs” are determinable only by other cognitions. Atkin 2013.

127. Already we find Peirce in 1868 arguing very strongly that it is not possible for humans to distinguish absolutely between mediate and immediate “cognitions”, that is, between the products of consciousness and the intermediate/external processes determining that consciousness. Peirce 1868.

128. Peckham 1979, 56, 68-70, 97.

129. 115.

130. xviii, 130, 183, 241-243.

131. 115-118.

132. 117-118.

133. Peckham 1986, 182.

134. Peckham 1979, 115.

135. For further discussion of possible objections and Peckham’s response, see 115-116.

136. Peckham 1979, 115 (orig. emphasis).

137. *xvii.*

138. 115-116.

139. 115 (orig. emphasis).

140. For discussion, see Peckham 1995f, 296, 300.n2.

141. See for discussion of the fictive aspect of signs: Peckham 1979, on categorization and judgment 70-78; 83-86; on nonverbal signs 94-96; on perception 96-97.

142. 92.

143. 109. For further discussion of what Peckham calls connectives, see 103-104.

144. The most complete thorough analysis of the relation of verbal behavior and non-verbal behavior is contained in *Explanation and Power*.

145. 262.

146. 164.

147. On judgments appropriate response, see 37.

148. 162.

149. For discussion of judgmental behavior, see 39-40.

150. See 163-164. The strategies can be reduced to two, namely, seduction and force.

151. For discussion of judgments of appropriate response, see 162; On judgments inappropriate response, see 47.

152. For discussion of his notion of "semiotic dyad," the self-imposed interaction with one's own response history, see 163.

153. Peckham 1979, 93,163.

154. Peckham 1986, 182.

155. 183.

156. Peckham 1979, 162.

157. 163.

158. 164.

159. 164.

160. 165-166.

161. 262.

162. 15.

163. See Appendix A.

164. Together the projects have involved diverse and multidisciplinary teams based in university studio-labs and have straddled academic conferences, festivals, and exhibition contexts. For each titled and dated work I have indicated the project principals by name plus (in some cases) the name of the studio-lab in association with which the work was undertaken. As is traditional for the performing arts, I have listed just the premiere date and location for each. Where necessary, I have also included a version number. This is usually done to indicate a significant modification to the core apparatus, orientation, or leading partners involved.

165. For discussion, see Smoak 2011, 137-139. Included as Appendix D.

166. Indeed, many have criticized this model of interactivity. \Cites[See, for examples,]{}{Suchman:2007}{Penny:}

167. Massumi 2011b, 46 (orig. emphasis).

168. 46.

169. Massumi 2011b, 46.

170. 46.

171. 49.

172. 47.

173. 48-49.

174. 52 (orig. emphasis).

175. See Peckham 1979, 107-110, 148.

176. For discussion, see 135-138. For an extended analysis and further examples, see essay titled “The Problem of Interpretation” (1978) in the third volume of collected essays.]Peckham:1978

177. 135-137.

178. 136.

179. For fuller discussion of the inherent contradiction of situational thinking, see Peckham 1995f, 19-21.

180. 21.

181. Peckham 1979, 137.

182. 138.

183. Peckham 1986, 185. Peckham attributed the insight to the anthropologist Irving Hallowell.

184. 185.

185. Peckham 1995f, 337.

186. Peckham 1979, 138 (orig. emphasis).

187. Peckham 1986, 183.

188. 184.

189. 184.

190. 184.

191. Peckham 1965, 200.

192. 201.

193. 49 (orig. emphasis).

194. 65 (orig. emphasis).

195. 66 (orig. emphasis).

196. 68 (orig. emphasis).

197. 206.

198. 206.

199. For discussion of Peckham's theory of perception, see 207–217.

200. 221.

201. 33.

202. 69. Bruner attributed the origin of the concept to Bertrand Russell.

203. 48.

204. Bruner, Goodnow, and Austin 1956, 156 (orig. emphasis).

205. For discussion, see 180.

206. 158.

207. The conclusion is itself quite possibly ethnocentric. Bruner speculated that our basic notion that common effects have common causes is perhaps the source of our confusion.

208. Peckham 1965, 71.

209. Peckham 1995d, 273.

210. 273.

211. Matalene 1995, 219.

212. Peckham 1995d, 273.

213. Peckham 1979, 217-222.

214. Peckham 1965, 221.

215. For discussion of semantic discontinuity in fiction, see Peckham 1995d, 279.

216. Matalene 1995, 219.

217. 219.

218. Peckham 1995f, 358.

219. Peckham 1995d, 275.

220. Peckham 1995f, 330-331.

221. Moronson 1986, 199 (orig. emphasis).

222. Peckham 1995i, 211.

223. In Appendix A, I offer three mini-case studies pertaining to the process of making interactive, sensor-based responsive media environments.

224. Ghansah 2011.

225. Peckham's theory at least show some of the ways how and why it does, and how we can renew it.

226. In other words, being and becoming.

227. Notably, I have not attempted to connect Peckham's account of perception to recent enactivist psychology and neuroscientific research, though it should be clear enough what the primary interest is for them. For readers whose interests lead in this direction, I would strongly encourage focusing on those aspects that are related to behavioral factors.

228. This is basically an extension of the arguments in Dewey's famous “The Reflex Arc Concept in Psychology” (1896).

229. Peckham 1979, 107.

230. 97.

231. See, disussion 107.

232. Perception can be called an act in the general sense given by Suzanne Langer (1967). It is a patterned behavioral event, with clearly defined phases indicated by an initial pressure to begin, subsequent periods of intensification and complexification, consummation, and resolution, finally succeeded by a new pressure to begin.

233. 109.

234. Peckham's argument is more or less simple, though the consequences as set forth in *Explanation and Power* are enormous once they are extended into the transactional or social sphere. This is related primarily to the second form of randomization, specifically negation.

235. 109.

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Appendices

Appendix A – Notes Toward Beginning Analysis

For the things we have to learn before we can do them, we learn by doing them. —

Aristotle, *Nichomachean Ethics*

In this Appendix, I offer observations pertaining to the process of making interactive, sensor-based responsive media environments which are useful for beginning analysis. More specifically, three different situations are considered: participation in collaborative workshops, the creation of intermediary works and experiments, and the presentation of provisional findings in the form of finished works and presented to an audience for feedback. I draw from three prior research-creation projects.¹ These include *Artaudian Lights* (2006–2008), *Your Participation Not Required* (YPNR) (2010), and *Just Noticeable Difference (JND)* (2010–2013). Each of these completed works involved working together with many other makers, whether as a consequence of ongoing research-creation activities under the umbrella of one or more active studio-labs, or through specially organized group workshops, or as the consequence of producing special events for the public—or, often, some combination of all three.

This selection of cases aims to demonstrate a range of types as well as outcomes. The first case considered, *Artaudian Lights*, can be viewed as a sketch, which provides a record of an idea and provides data about something that the artists observed without necessarily being able to affect.

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YPNR can be considered as a preparatory study or intermediary work which forms the basis for and initial manifestation of techniques used for later independent projects such as *Atmosphere* and *Displace* which enjoyed more institutional support for full production in the form of grants, greater access to facilities, and better opportunities for showings. The third and last example looked at is a fully developed and autonomous work of art, *Just Noticeable Difference (JND)*.

First, I give a brief description of the basic elements of each grouping of humans-machines-environment observed. This is followed by an abbreviated account of what happened as a result (or better, an effect). Notably, I have not attempted to provide an exhaustive account of what took place or to tell “what really happened” — an impossible task. Indeed, each grouping of humans plus machines plus environment (situation) already comprises a indefinitely complex web of interacting factors (social, cultural, economic, and political) that are undoubtedly important to consider for comprehensive understanding of each development. For my purpose here, I have limited my attention to what I perceive to be the main benefit of each as it relates to how each arrangement of human-machine-environment is accomplished.

Artaudian Lights (2006–2008)

Specially planned workshops organized around research-creation topics give participants the opportunity of variously engaging with more advanced artists, researchers, faculty, and collaborators, and students who may be working together on shared research and artistic concerns. *Artaudian Lights* was a workshop that took place in Hexagram-Concordia’s Black Box research facility in collaboration with choreographer and faculty researcher Michael Montanaro² and with support from the Topological Media Lab³ (TML) in 2006. The three-week capstone residency marked the beginning of a continuing exploration in the lab into development of new technological and human architectures for creating performance-based sensing environments.

The collaboration was designed to address issues around the interaction of movement (i.e., a body in motion, a becoming-body), lighting and projection through the use of camera-based

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Figure C1 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

tracking and computer vision. A shared aim of this research was to explore and identify new movement techniques and applications of pattern recognition and computer vision that enable us to build environments that are “rich, not complicated.”⁴

I was primarily responsible for lighting the environment while Montanaro focused on choreography.⁵ My contributions include the development of custom lighting designs and animation software integrating TML’s custom feature extraction and tracking software. Additionally, I oversaw all design, technical, and practical aspects related to the setup and takedown of the apparatus used, including traditional theatrical lighting instruments as well as digital projectors.⁶

The production setup consisted of a infrared (IR) motion sensor camera mounted directly overhead in the grid of the two-story black box research space. The camera was connected to dedicated computers running specifically made feature extraction and tracking software.⁷ A second high-definition video camera was positioned within the space and focused on the two dancers. The additional camera provided an another possible source of movement data as well as visual data

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that could be used to texture the video images displayed on the wall behind the dancers.

As the dancers moved across the stage, motion data captured from the overhead camera was mapped to a real-time simulation which was based on the Navier-Stokes equations used to describe fluid motion. The computer model was used to supply control data to a “low” resolution display system comprised of twenty-four DMX-controlled conventional spotlights arranged in a circular array and projected onto the floor from positions located in the grid overhead.⁸

By design, the lights doubled as IR illuminators. Since the camera used overhead was sensitive to changes in lighting—any changes in lighting—it reacted to reflections and shadows of dancers as they moved across the stage as well as radiance from the lights themselves. This provided a rich source of gestural data that doubled (and redoubled) the actual movement in a way that was tangible to the dancers as well as to the audience.

The same model was used also to generate a dynamic video mask in real-time in order to achieve the windowing effect in the displayed video images shown on the stage wall directly behind the dancers.⁹ The same setup could be reconfigured easily to explore different configurations as well, including scenarios involving moving objects on a table-top.¹⁰ What the mask revealed were time-delayed images of the performers which were used to further reinforce the doubling strategy. The resulting video synthesis was projected by means of high-performance DLP projectors onto a two-story reflective wall that served as a screen located directly behind the dancers.¹¹

A primary benefit of the setup used was that it could be easily and quickly modified (through parameterized settings set in software) on the fly to meet changing requirements of the choreography as it was being developed over the course of the residency. Montanaro and the dancers thus were able to work quickly together without costly interruptions in order to explore different improvisational possibilities afforded by the approach taken to modeling gestural data being explored by the TML. Another highlight of this coordinated approach is that it allowed the lighting to be an integral part of what took place as it was tuned in real time during the movement workshop. This style of rehearsal process represents a materially different approach to creating events than is

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usually encountered, for example, in conventional theatre where often technical elements such as lighting are only brought together during later stages of production, perhaps only for a few hours or as much as a few days, just in time to make final changes prior to opening night.

Your Participation Not Required (2010)

Capstone projects serve as intensive, experiential learning projects, require significant effort in the planning and implementation, as well preparation of a substantial final presentation to an invited public audience. Transitional works and experiments comprise another essential part of a stimulating compositional process. These usefully serve as primary means of gathering data about what participant viewers do (i.e., how they behave in particular situations) that can be further refined in subsequent projects and collaborations. Indeed, the central lighting ideas and technologies utilized later for *Atmosphere* and *Displace* were based on techniques that, in fact, were instigated earlier in the course of the realization of a collaborative multimedia installation titled *Your Participation Not Required (YPNR)*.

YPNR is an example of an intermediary work that began as a series of personal studio experiments involving reflective light and computer-controllable LEDs which later evolved into a productive collaboration. The initiative marks the beginning of an ongoing stream of research involving light, sound, and the built environment aimed at investigating new techniques of relation for composing a sense of place, that is how *a* place becomes *this* place for someone. *YPNR* was made with artist and researcher Matthew Peters Warne;¹² I was primarily responsible for the lighting the environment as Warne concentrated on the audio design. The culminating light and sound installation was presented twice to the public, once at Concordia University's FOFA Gallery during Congress of the Humanities and Social Sciences 2010 in Montreal, Canada, and again at Brown University's Grant Recital Hall in Providence, Rhode Island, USA for Pixilerations [v.7].

For the FOFA showing, Matthew and I explored different senses of architectural space. In this way, by modulating heterogenous phenomena such as sound and light, we wondered how

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Figure C2 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010. Tricolor (RGB) SMD LEDs, wood, steel, laptop computer, Enttec ODE DMX ethernet gateway

it is possible to experience space as it is dynamically composed. The experiment was designed to challenge commonsense notions of a space's dimensionality through the synthesis of abstract light and soundscape. Similar to other projects undertaken together, *YPNR*'s media systems share parameters that condition their operation without explicitly privileging gallery visitors.

YPNR's lighting takes as its point of departure the possibility that the “sense” of color may be as fluid as that of words, that is the meaning of color is its *response*. Matthew and I wanted to see how, by modulating heterogenous phenomena such as sound and light, it may be possible to experience space as it is dynamically composed. *YPNR*'s sound combines indirect diffusion and ambisonics to play with the gallery's acoustics. The lighting of *YPNR* combines techniques drawn from prior work in video installations and lighting design to structure a color continuum for painting the gallery with media.

Visitors to the FOFA gallery were invited either individually or in small groups to contemplate

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a changing light display accompanied by different soundscape compositions, which play from speakers installed around the gallery space.¹³ The semi-darkened room contains an arrangement of twelve, two-meter-high computer-controlled RGB LED lighting fixtures mounted on stands that are strategically placed throughout the room. No other light is visible apart from what was emitted from the fixture themselves. The lighting fixtures utilized provided a continuum for “painting” the gallery with ephemeral color, allowing opportunities for rehearsing alternative corporeal relations with the environmental surround.

The primary object of visual interest is not the lighting sources themselves, but rather the pattern of changing light and color reflected on the gallery walls, floor, ceiling, as well as the fixtures themselves which reflect and emit light. Changes in lighting were choreographed with variation in sound and quality of sound as visitors moved through the colorfully lit space. Fixture placement was optimally determined by considering lighting coverage needed as well as projection angles offered to create spatial and visual interest.

For artistic and production reasons, the systems developed for public showings frequently relied on streaming data notably generated from files of prerecorded and composed media. However, the lighting modulation and sound spatialization systems developed for this project do not make any distinction between prerecorded and “live” media, whether it is obtained from cameras, microphones, or other sensors. The emphasis of these presentations was not on technology as much as the effects of the techniques developed. All computers as well as audio and lighting control equipment used during development and for running the installation were located in an adjacent room or in a separate enclosure.

For me personally the title “Your Participation Not Required” represented a reaction against simplistic exhortations such as “interact, or else!”, which, if not taken critically, fail to ask whose interests the injunction serves. In chewing over possibilities with Matthew, I had also vaguely intended to make an important point about participation in order to put pressure on the idea of the spectator (as a subject) as being absolutely essential to what is experienced, in which the world

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is seemingly reduced to a stream of subjective perceptions. The words failed to do the work that I wanted them to do, or else only seemed somewhat puzzling to some. Indeed, most visitors appeared to assume the system was sensitive to their actions in some integral way, and even if they could not quite make it exactly what it was.

Intermediary works and experiments like *YPNR* are useful for suggesting the advantage of looking on familiar occurrences like lighting and sound as being composed of groupings of disaggregated elements rather than as already named (i.e., known) and categorized phenomena. A different orientation towards phenomena (or, better, effects) is needed in order that we may begin to learn to recognize incipient relations in order to see what they can do. Another approach is crucial if we are going to get a fix on— empirically — vital questions that we are not actually prepared to even ask yet, that is in connection with everyday activities.

Just Noticeable Difference (2010–2013)

When Chris Salter approached me in 2009 to collaborate with him and artist co-collaborator Marjje Baalman on lighting ideas for an art piece titled *Just Noticeable Difference (JND)*, it seemed to me initially to be an impossible project. Indeed, the sensory environment we developed was conceived for one visitor at a time lying in nearly complete DARKNESS! The installation takes its nominal title from nineteenth century German early experimental psychologist Gustav Fechner's notion of the “just-noticeable difference”, or “JND.” The concept of a JND is best understood as a statistically measured threshold at which the change between two stimuli is initially perceived.

JND is an example of a research-creation project that successfully demonstrated it had legs of its own. The project received initial funding support from the Social Sciences and Humanities Research Council of Canada (SSHRC) and the Conseil des arts et des lettres du Québec (CALQ). Since its 2010 public premier at the Experimental Media and Performing Arts Center (EMPAC) of Rensselaer Polytechnic Institute in Troy, NY, *JND* has been featured at over a dozen cultural venues around the world from 2010–2013, including PACT Zollverein in Essen Germany (2010),

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Figure C3 – Chris Salter with Marije Baalman and Harry Smoak, *Just Noticeable Difference (JND)*, 2010–2013. Pre-fabricated enclosure, vibrotactile actuators, computer, customized RGB LED lighting instrument, computer, electronics

Elektra Festival in Montreal (2011) and the National Art Museum of China in Beijing as part of the TransLife 2011 International Triennial of New Media Art, among others.

I had primary responsibility for the lighting environment while Baalman and Salter focused on the sensing infrastructure and research direction, respectively, and jointly on the sound design. For this project, I designed a series of custom LED lighting instruments (hardware as well as software) to explore how we perceive the smallest degrees of change with different sensory stimuli over different levels of intensity. *JND* makes use of the SenseStage platform, another project which I collaborated on, which comprises a low-cost, open source wireless sensor infrastructure (hardware and software) developed by Marije A.J. Baalman and LabXmodal for live performance and interactive, real-time environments.¹⁴

JND's physical installation consists in a pre-fabricated soundproof enclosure measuring 3.10 m long x 2.75 m high x 2.3 m wide and covered in a polished plexiglas skin¹⁵, either white or black. Inside, while lying on their back with the face up, each visitor was exposed to a wide range

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of sensory media (visual, tactile, and auditory) combined in composition lasting 12 minutes. The installation was designed to investigate how we perceive patterns of change involving multiple sensory stimuli at continually varying levels of intensity.

The composition used is structured into three parts with a concluding episode. In the beginning, visitors were presented with coordinated displays of media that resulted in almost imperceptible sensory contrasts entailing touch, light, and sound. These initial sensations become more complex as subtle interactions between micromovements detected by the sensing apparatus and resulting synthesized media displays are introduced, potentially reconfiguring the visual or auditory experience.

Here is an ideational description of the compositional structure from the artists' own documentation:

[...] barely noticeable stimuli in the first movement of the work slowly gives way to more rhythmic pulses in the second and third, as moving one's body in barely noticed ways shifts the intensity of the experience of the various media, making the patterns feel more disordered and chaotic over time and generating powerful hallucinations and afterimages. Finally, in the third movement, the intense vibrations that ended the first movement return.¹⁶

As expected, actual developments reported varied tremendously in character beyond the structured compositional arrangement. As studied by experimental psychologists, JNDs are understood to be inherently subjective. Individual measures can vary greatly according to motivational and situational factors. For example, in anecdotal reports connected with our installation, respondents with extensive dance training and experience interestingly described strong sensations of movement in connection with changes in color intensity (hue), even though the instrument positions themselves were fixed. During a particular preview session, conducted after hours in a basement studio one-on-one with a male facilitator, the majority participants reported strong bodily reac-

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tions and pronounced anxiety. Compare this with presentations of the project where it was clearly labeled an art work and responses were more apt to be described in pleasant, even frivolous, terms.

This observation suggests the relevance of first person accounts for ongoing development of ideas in research-creation. For *JND*, the primary means of collecting “data” (that is, *how* people respond) during initial development and later refinement included direct observations, participant interviews, and visitor surveys. For primary observations, was as artists participated, over many sessions, during the project conceptualization and production phases. Additionally, we talked directly to participants, both before and after individual experiences through structured and unstructured interviews and visitor surveys. This is further indicative of some of the ways in which the interests of the artists are entangled in the works that result.

Notes

1. For a more complete List of Works undertaken in preparation for writing this thesis, see Appendix D.
2. See <http://www.michaelmontanaro.com/>.
3. Topological Media Lab was established by Sha Xin Wei 2001 as a transdisciplinary atelier-laboratory for collaborative research creation. See <http://topologicalmedialab.net/>.
4. For related TML projects in this domain, see <http://topologicalmedialab.net/research/architecture/>.
5. See <https://vimeo.com/album/1476813>.
6. Figure 3 shows a production setup containing a traditional lighting console, laptop and desktop computers, DLP projector projectors, and various other supporting equipment.
7. In computer vision, feature extraction refers to techniques used when dealing with high-dimensional datasets (such as a digital image) that involve reducing it to a low-dimensional representation in order to make it more manageable for processing and analysis. Tracking loosely refers to those methods used for extracting motion information, e.g. from a series of video images.
8. See <https://vimeo.com/album/1476813>.
9. See Figures 6, 7, 8, 9, and 10.
10. See Figures 4 and 5.
11. For a thoughtful review focused on the relation between the two dancers, the projected video, as well as issues pertaining to initial audience reception, see Massumi 2011a, 77–80.
12. See <http://matthewwarne.com/>.
13. The installation’s sound design combines indirect diffusion and ambisonics to play with the gallery’s acoustics. Combining noisy sources like the murmur of a crowd and radio static with discrete sources that are difficult localize, the sound moves through a continuously changing environment.
14. See, for documentation pertaining specifically to the SenseStage platform, see <http://sensestage.hexagram.ca/jnd-1-semblance>.
15. In fact, two instances of the structure were constructed, the first in Canada and a second in Germany for touring. Marije Baalman performed as Technical Director for touring within Europe. The dimensions indicated in the description here are based on the European version.
16. LabXmodal 2012, 2

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Appendix B – Figures

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Figure 1 – Navid Navab, Jerome Delapierre, Michael Montanaro, and Tony Chong with the Topological Media Lab (TML), *Practices of Everyday Life: Cooking*, 2014

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Figure 2 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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Figure 3 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.



Figure 4 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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Figure 5 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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Figure 6 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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Figure 7 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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Figure 8 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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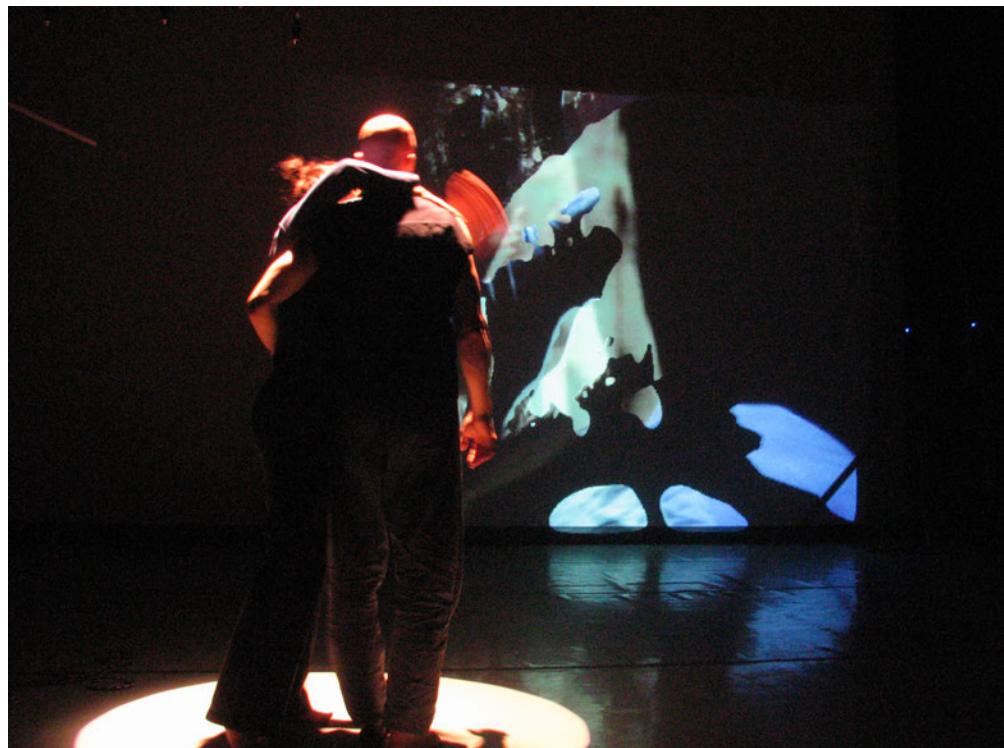


Figure 9 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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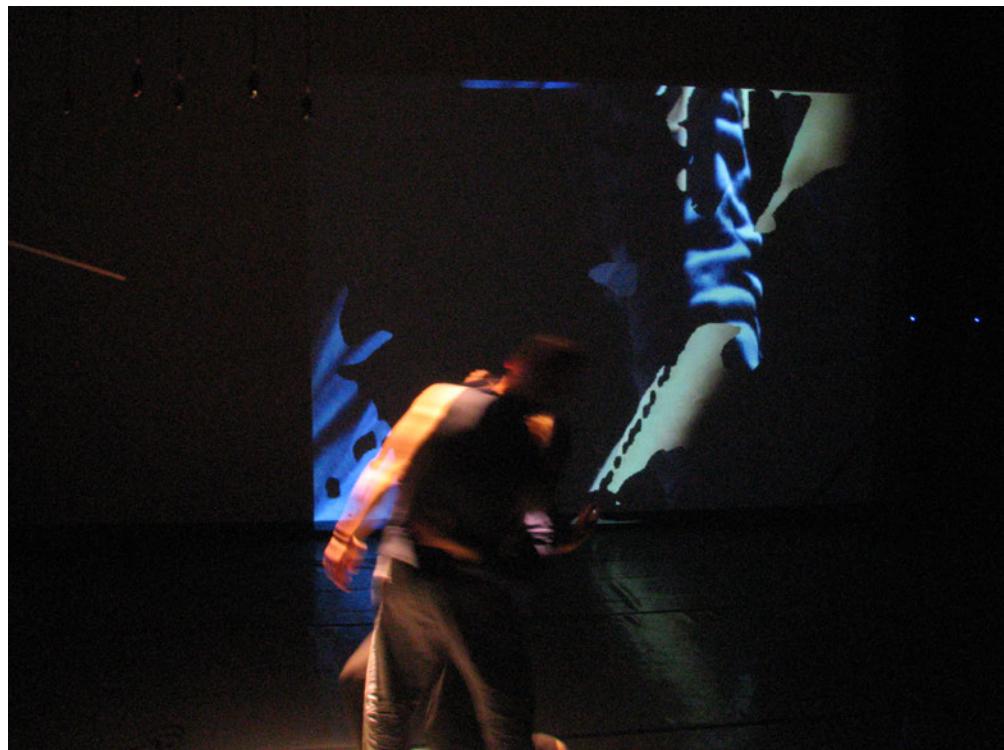


Figure 10 – Michael Montanaro, Harry Smoak, and Topological Media Lab, *Artaudian Lights*, TML, Montreal, Canada, 2006. Calligraphic video, structured light, experiment at movement and responsive architecture workshop.

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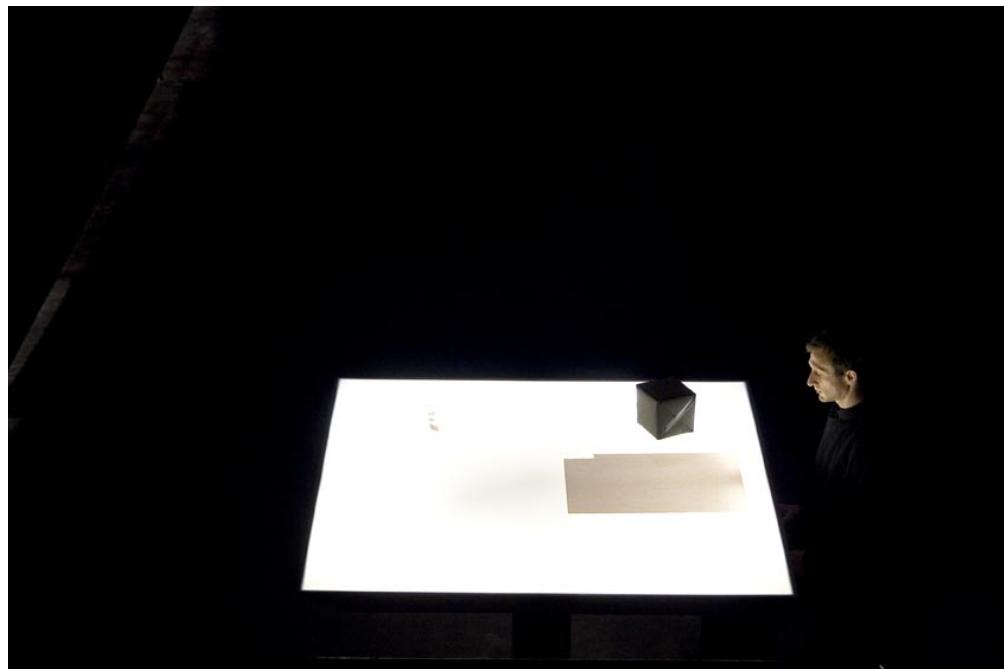


Figure 11 – Chris Salter with Michael Schumacher, *Schwelle, Part II*, 2007–2008

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Figure 12 – Chris Salter with Michael Schumacher, *Schwelle, Part II*, 2007–2008



Figure 13 – Chris Salter with Michael Schumacher, *Schwelle, Part II*, 2007–2008

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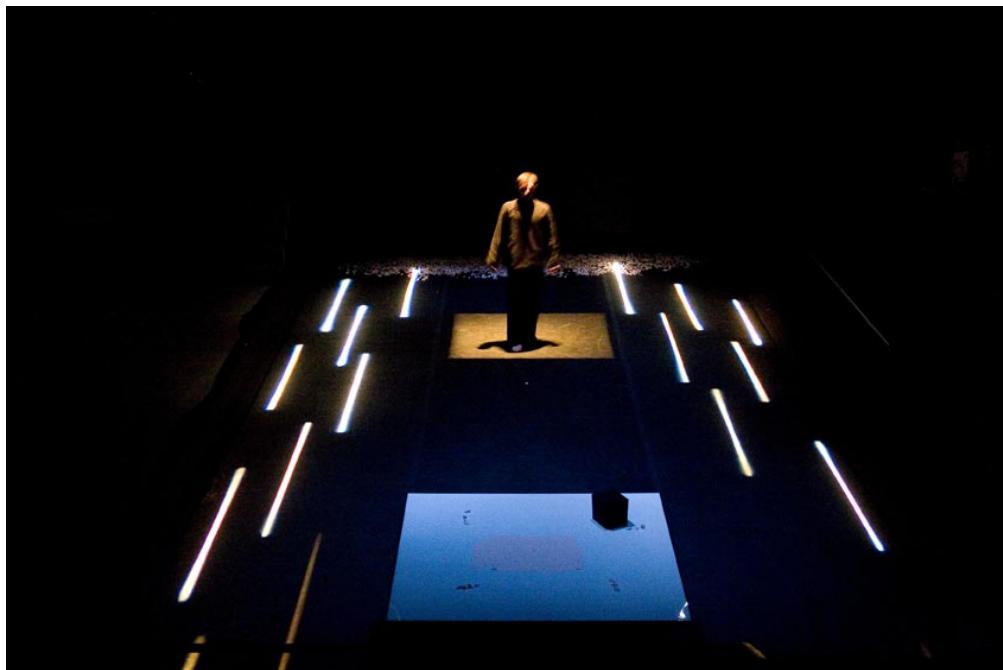


Figure 14 – Chris Salter with Michael Schumacher, *Schwelle, Part II*, 2007–2008

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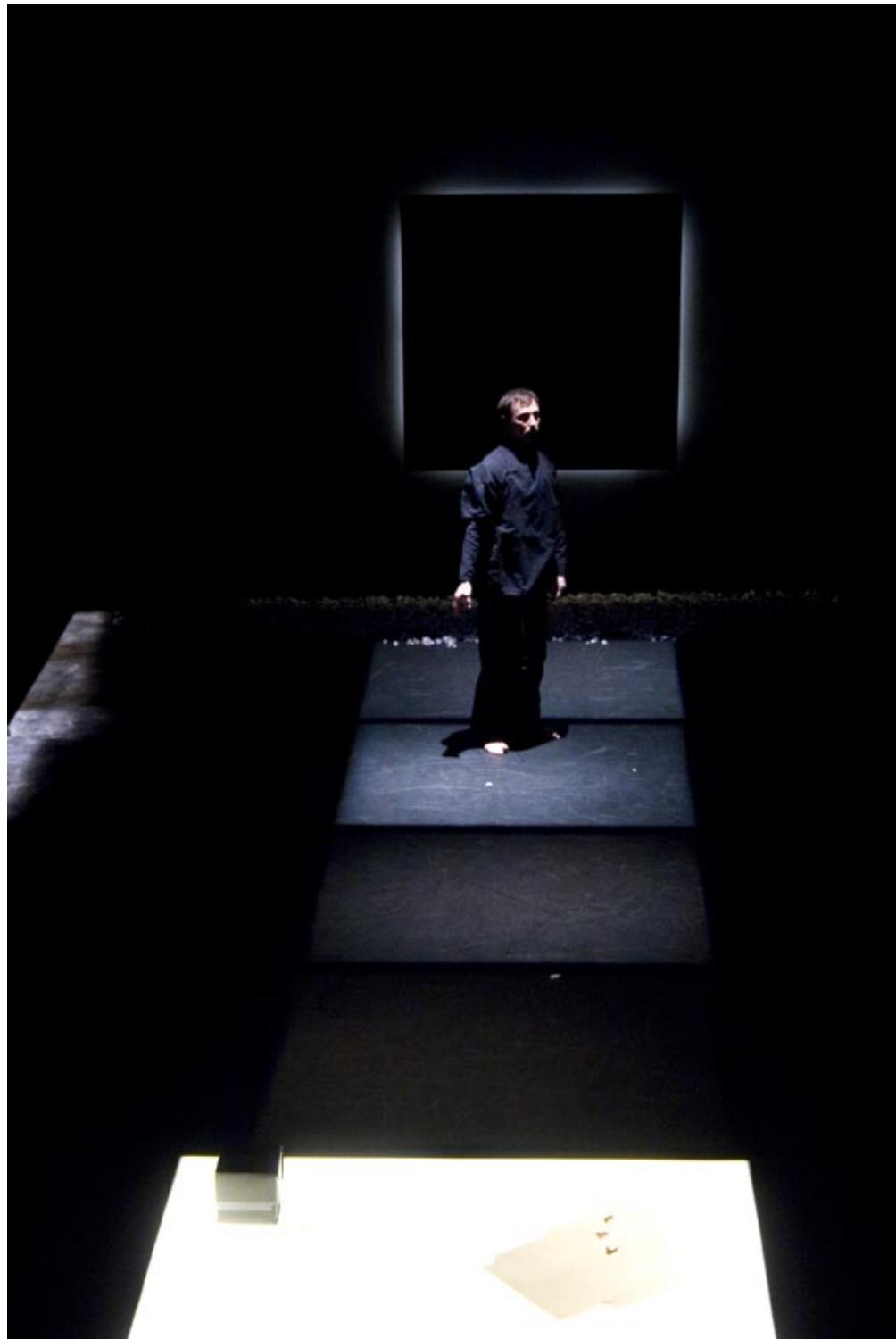


Figure 15 – Chris Salter with Michael Schumacher, *Schwelle, Part II*, 2007–2008

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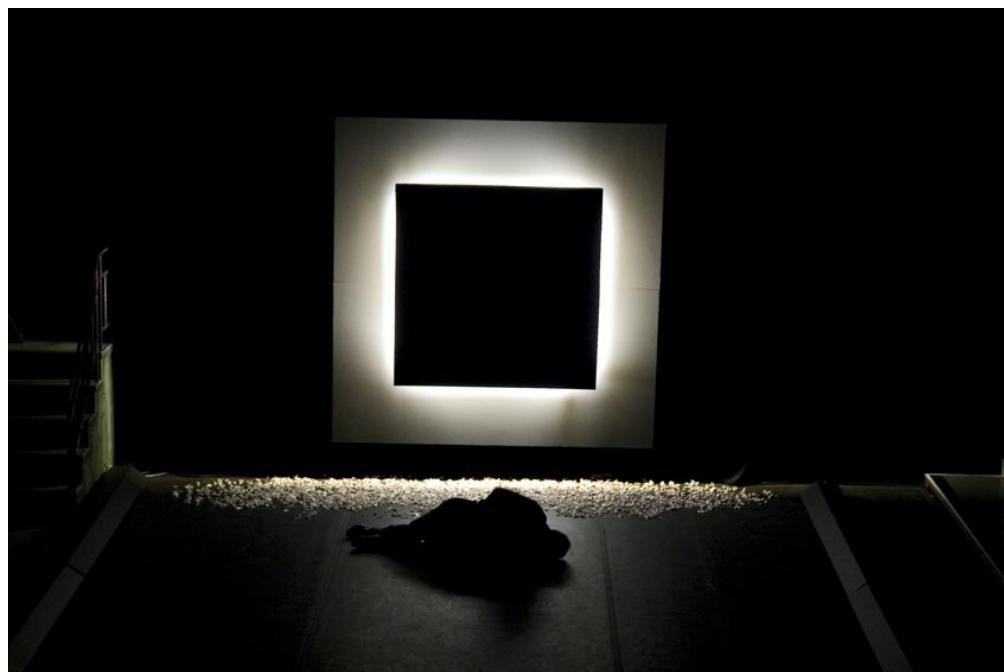


Figure 16 – Chris Salter with Michael Schumacher, *Schwelle, Part II*, 2007–2008

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Figure 17 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010

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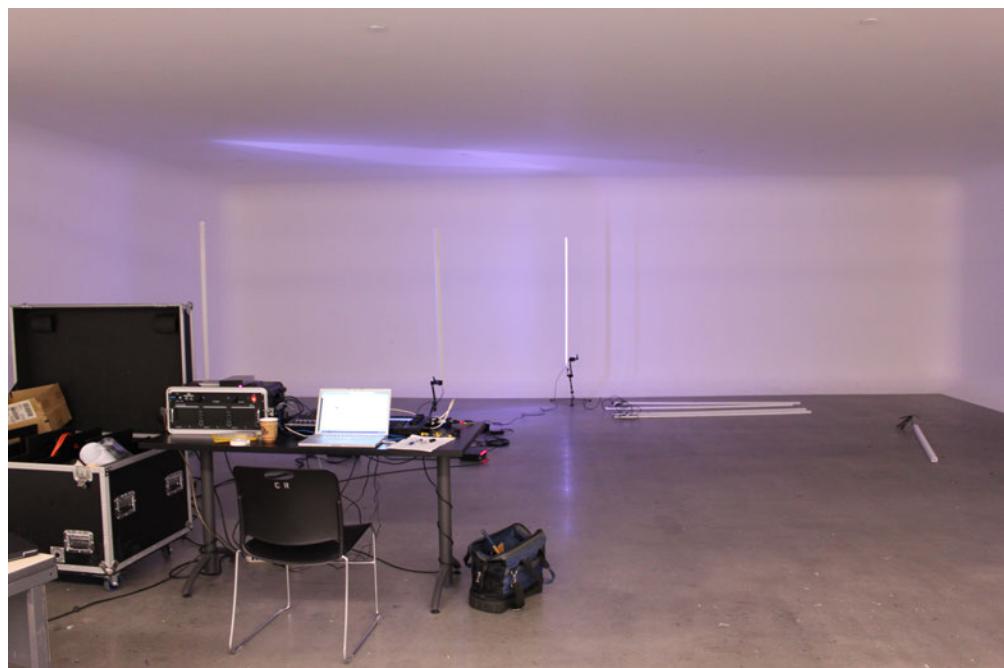


Figure 18 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010

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Figure 19 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010

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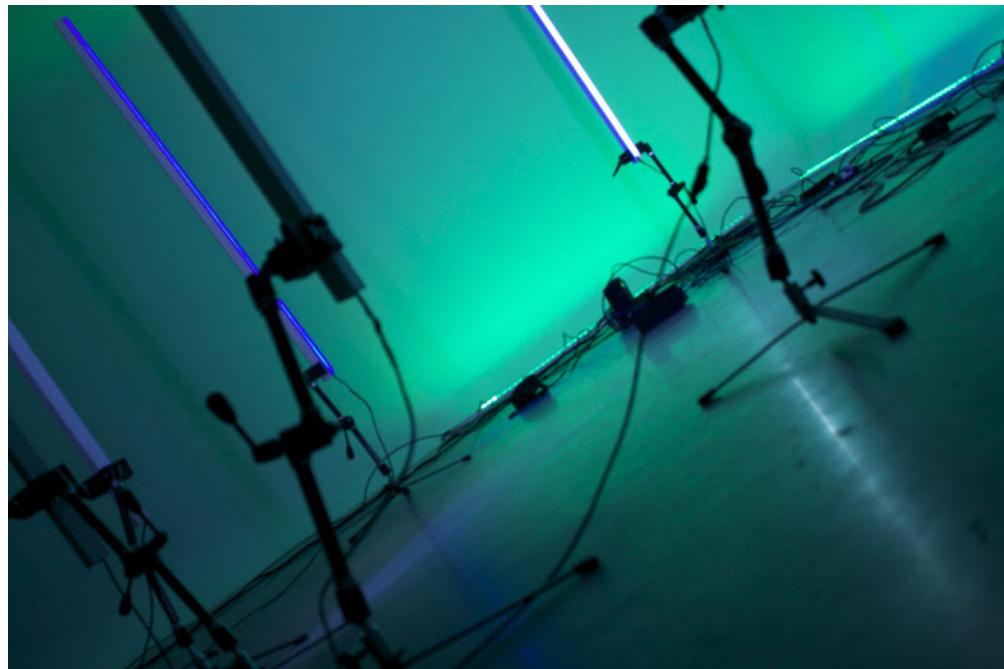


Figure 20 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010

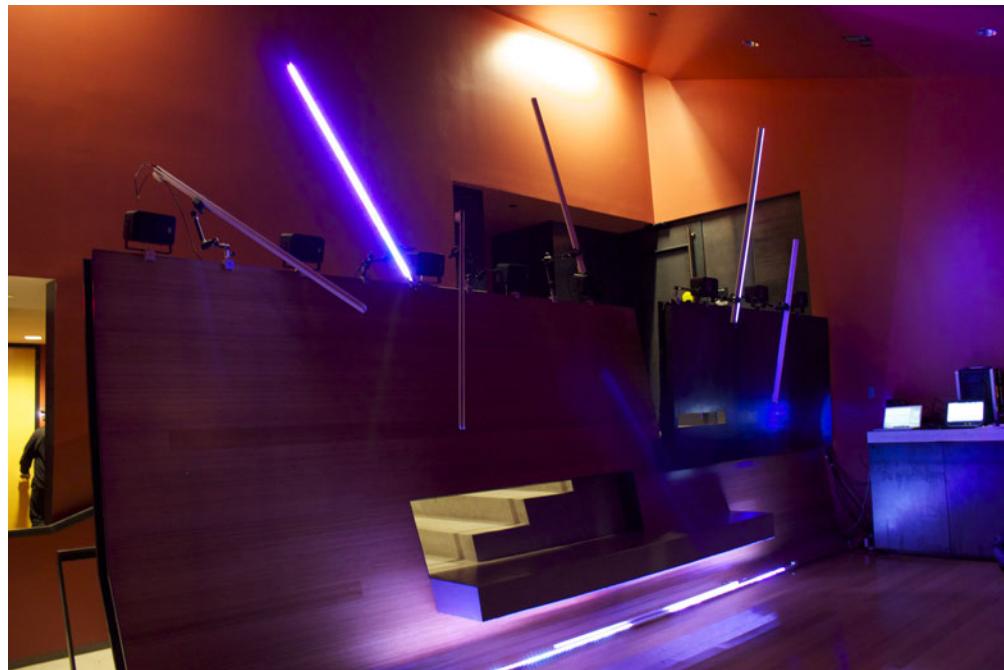


Figure 21 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010

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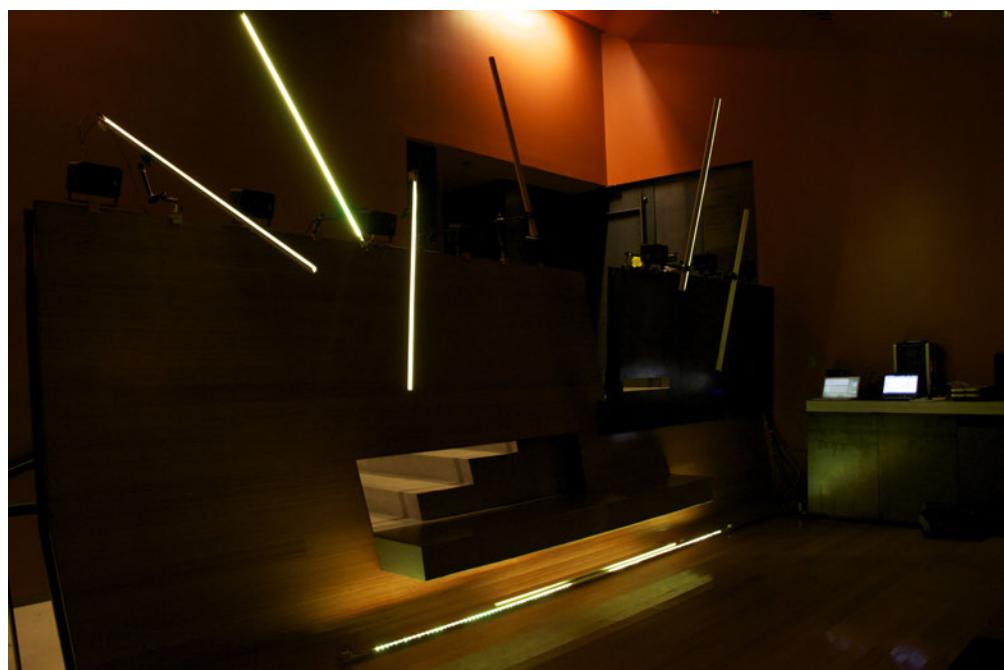


Figure 22 – Harry Smoak with Matthew Peters Warne, *Your Participation Not Required*, 2009–2010

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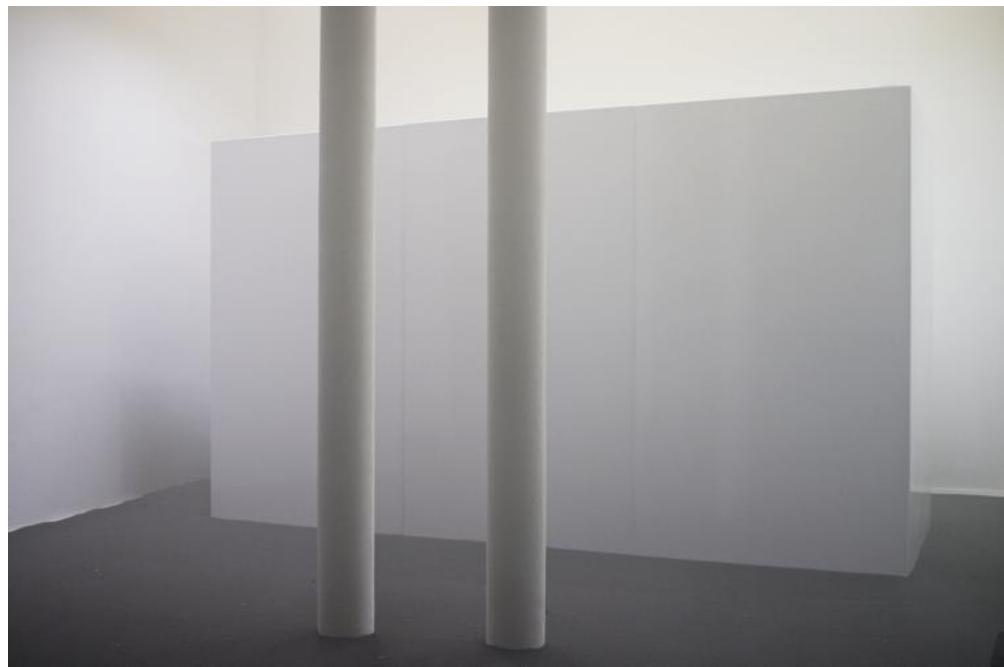


Figure 23 – Chris Salter with Marije Baalman and Harry Smoak, *Just Noticeable Difference (JND)*, 2010–2013

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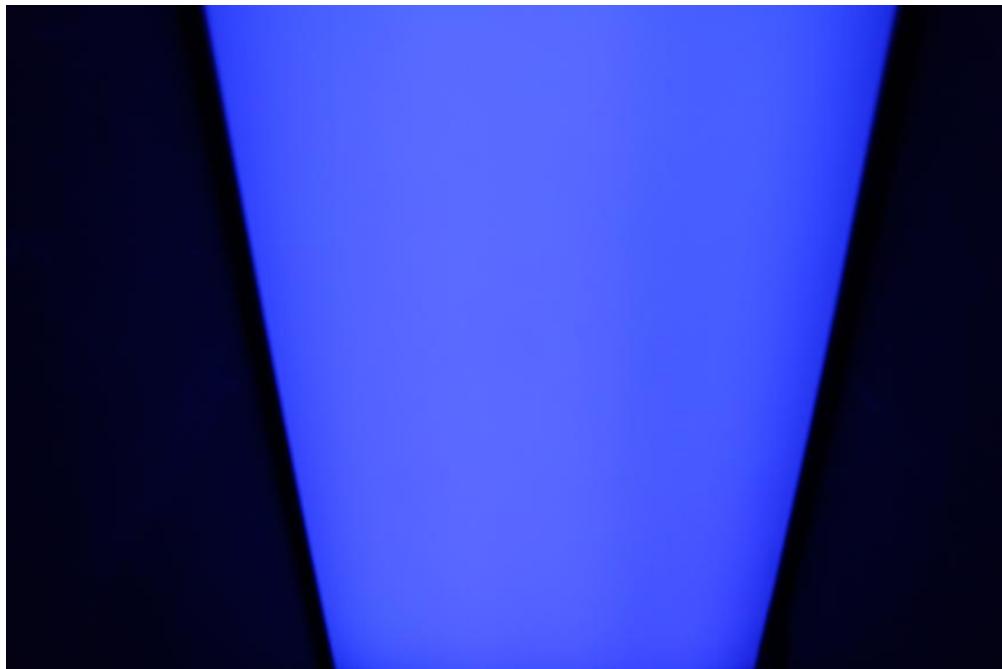


Figure 24 – Chris Salter with Marije Baalman and Harry Smoak, *Just Noticeable Difference (JND)*, 2010–2013

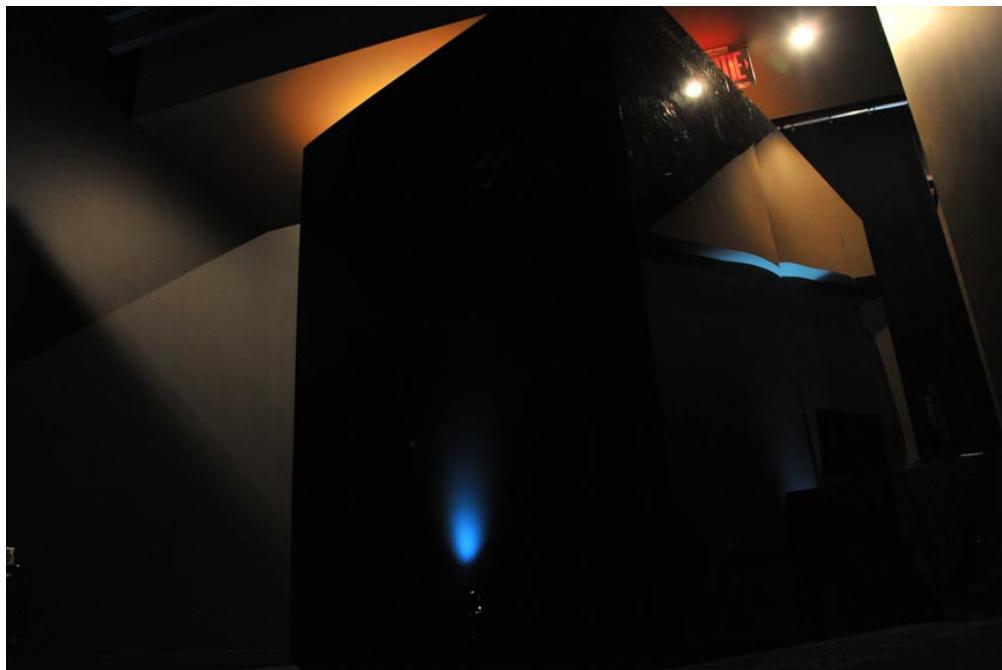


Figure 25 – Chris Salter with Marije Baalman and Harry Smoak, *Just Noticeable Difference (JND)*, 2010–2013

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Figure 26 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal

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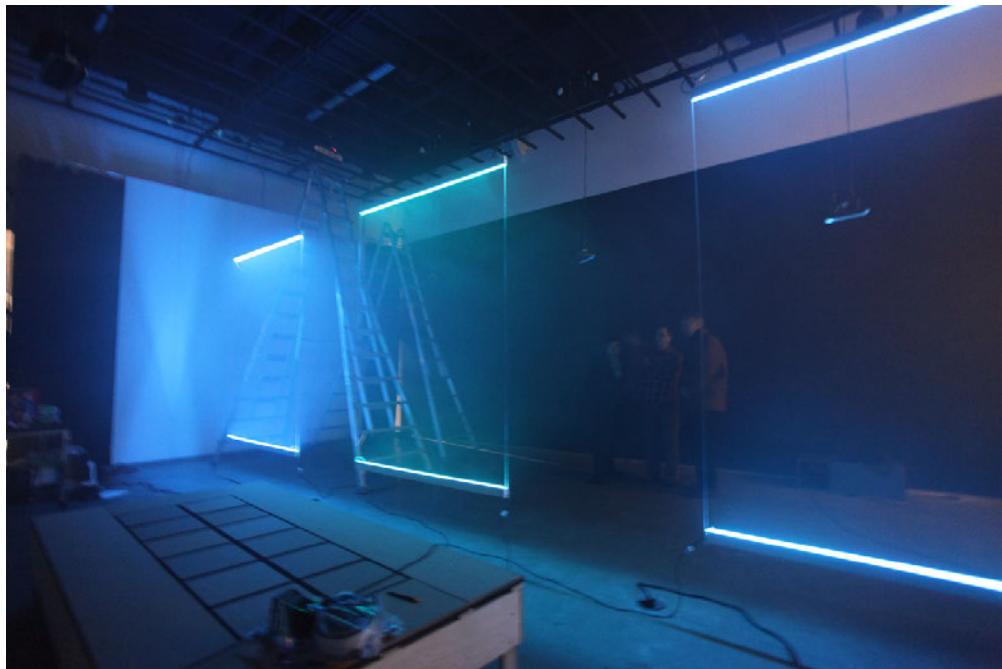


Figure 27 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal



Figure 28 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal

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Figure 29 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal

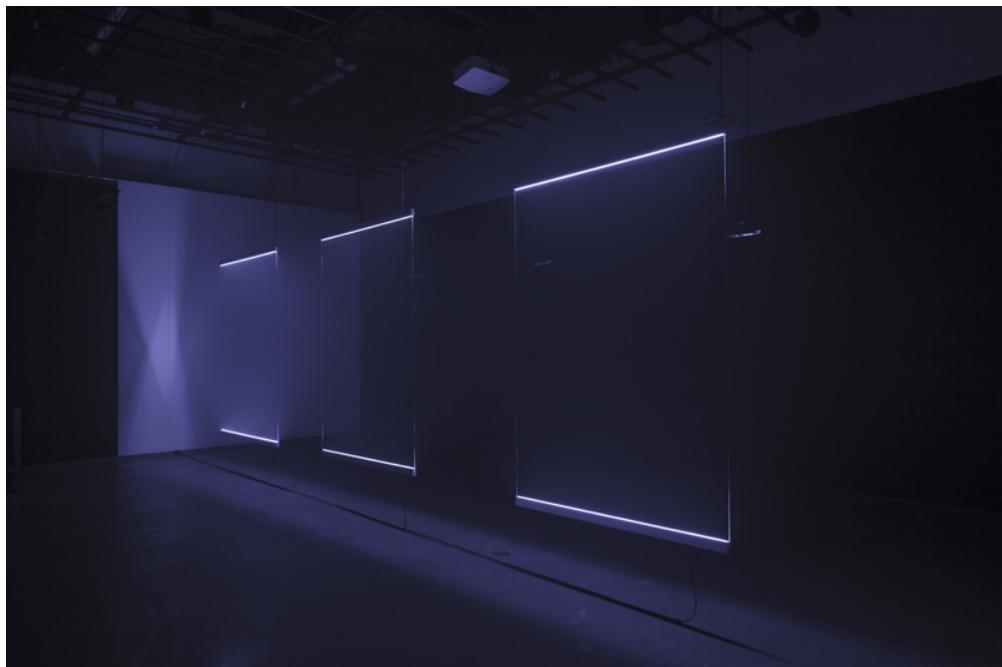


Figure 30 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal

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Figure 31 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal



Figure 32 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal

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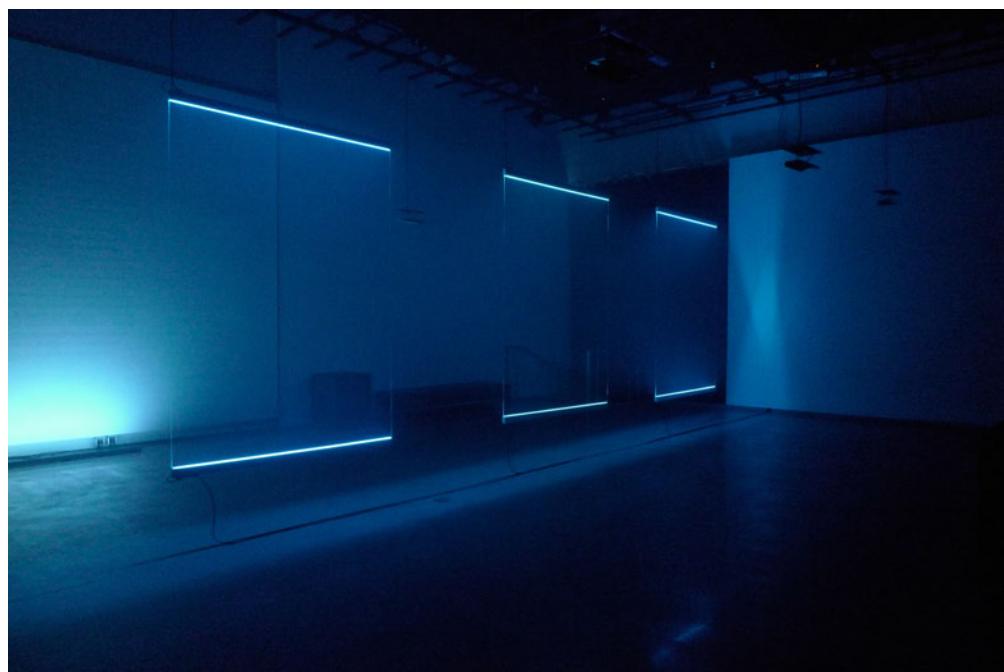


Figure 33 – Chris Salter with LabXmodal, *Atmosphere*, 2011), Gallerie FOFA, Concordia University, Montreal

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Figure 34 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

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Figure 35 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011



Figure 36 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

APPENDIX B

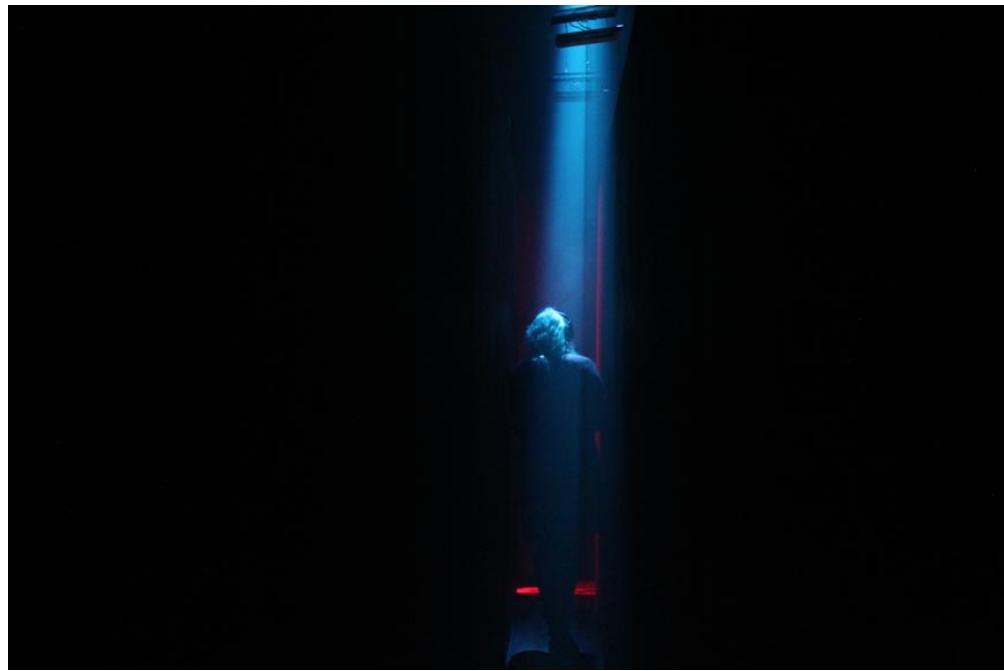


Figure 37 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011



Figure 38 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

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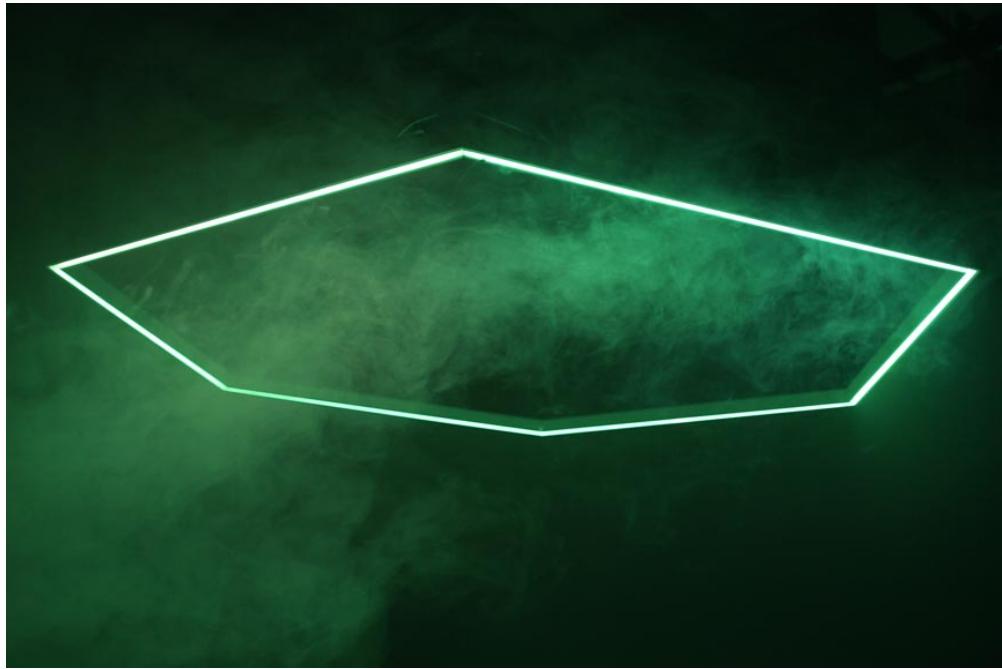


Figure 39 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

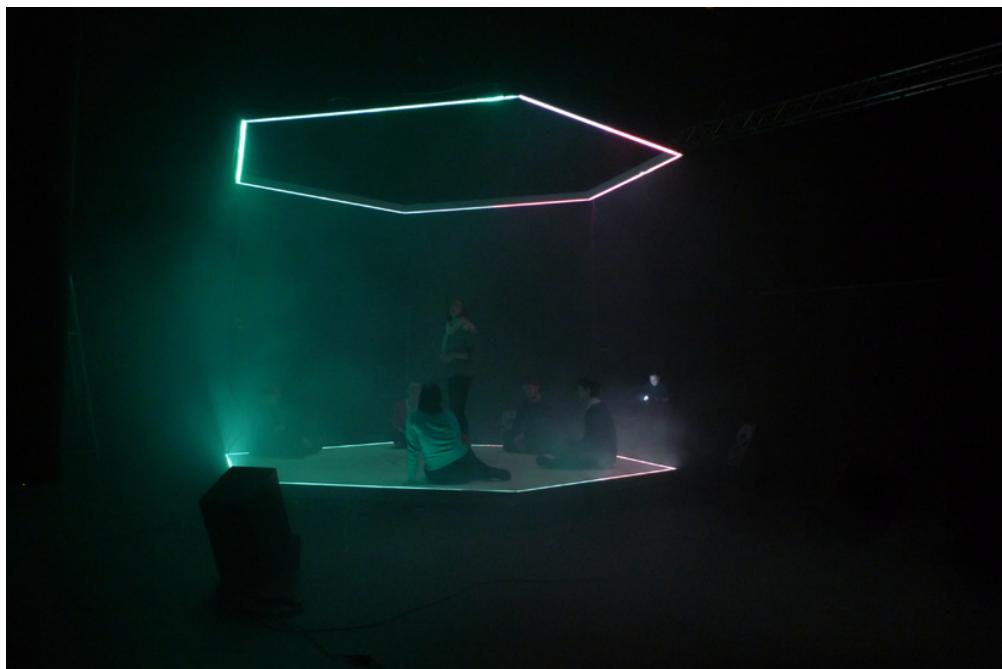


Figure 40 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

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Figure 41 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

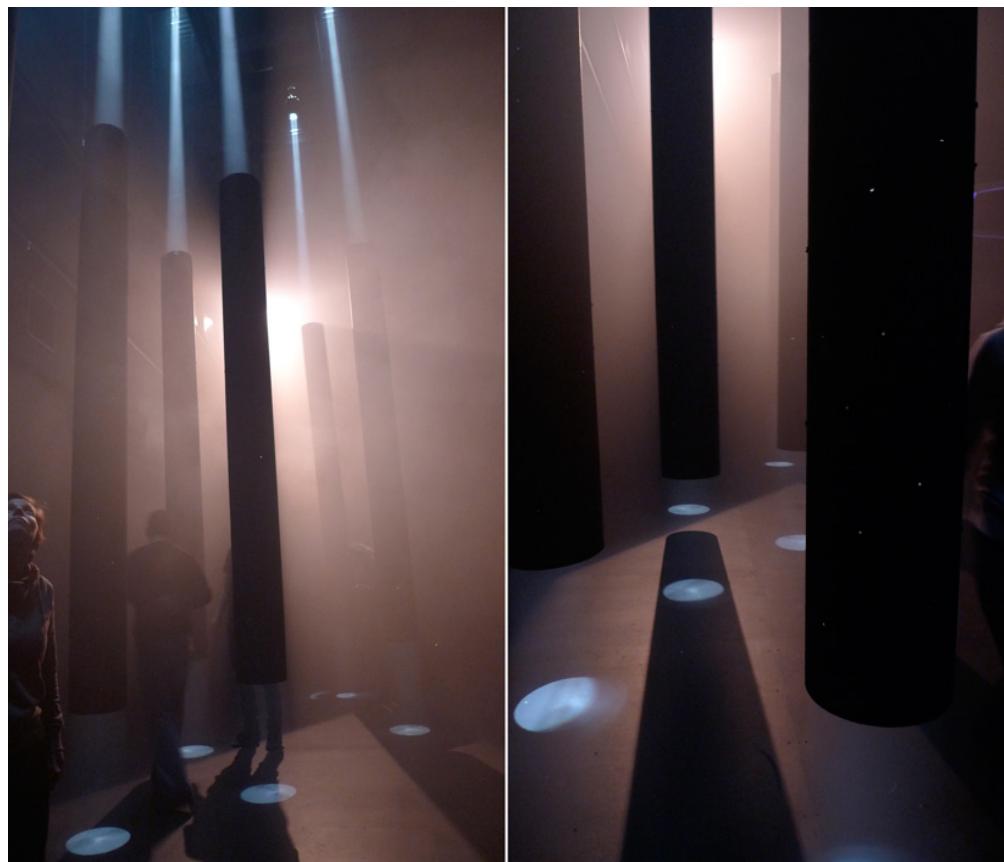


Figure 42 – Chris Salter, TeZ, and David Howes, *Displace v. 1.0*, 2011

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Figure 43 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands



Figure 44 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands

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Figure 45 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands



Figure 46 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands

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Figure 47 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands



Figure 48 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands

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Figure 49 – Chris Salter, TeZ, and David Howe, *Displace v. 2.0*, 2012, TAG Building, the Hague, Netherlands

Appendix C – List of Works

Original Performances

Displace 2.0, with Chris Salter, TeZ, David Howes et al. + Lab Xmodal, The Hague, Netherlands, September 2012.

Displace 1.0, with Chris Salter, TeZ, David Howes et al. + Lab Xmodal, Hexagram Black Box, Montreal, Quebec, Canada, November 2011.

Atmosphere, with Lab Xmodal, FoFA Gallery, Montreal, Quebec, Canada, January 2011.

Just Noticeable Difference, by Chris Salter, Marije Baalman, Harry Smoak with Lab Xmodal, PACT Zollverein, Essen, Germany, August 2010.

Your Participation Not Required, 2.0, by Harry Smoak and Matthew Peters Warne, Pixilerations Festival, Providence, RI, United States, September 2010.

Your Participation Not Required, 1.0, by Harry Smoak and Matthew Peters Warne, FoFA Gallery, in conjunction with the 79th Congress of the Humanities and Social Sciences, Montreal, Quebec, Canada, May 2010.

Artaudian Lights, by Michael Montanaro and Harry Smoak with Topological Media Lab, Hexagram Black Box, Montreal, Quebec, Canada, 2008.

APPENDIX C

Schwelle II, by Chris Salter and Michael Schumacher. Maison des Arts Crêteil, Festival EXIT, Crêteil, France, March 2008.

Remedios Terrarium, with Topological Media Lab, (FoFA) Gallery, Concordia University, Montreal, Quebec, Canada, 2008.

Reverse chronological listing of selected collaborative artistic projects undertaken. Each titled work is followed by a place-date subscription indicating the project principals by name plus (in some cases) the name of the studio lab in association with which the work was made possible. As is traditional for the performing arts, I have listed only the premiere date and location for each. In the case where a titled work does appear more than once, it is due to one or more significant modifications or developments having been introduced, representing a significant divergence or development from the original configuration, for example, either to the core apparatus utilized, the orientation, or people significantly involved.

Appendix D – Article

Harry Smoak. 2011. “Machinic Articulations: Experiments in Non-Verbal Explanation.” In “Poetic and Speculative Architectures in Public Space,” *AI & Society* 26 (2): 137–142. doi:10 . 1007 / s00146 - 010 - 0293 - 3, (*Reprint.*)

Machinic articulations: experiments in non-verbal explanation

Harry Smoak

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Abstract The essay presents a novel theory of meaning-as-response inspired by the pragmatist cultural historian Morse Peckham in the mid-twentieth century. This approach is useful here in consideration of how artistic behavior can make a difference in technical culture and in relation to innovative technical practices. Continuing from Félix Guattari's notion of the machine as a partial object, this essay examines the essentialist idea of computational machines as creative collaborators which haunts the model of interaction prevailing today. Following this negative critique, the essay advances a positive approach emphasizing partiality in experimental design practices as a step toward a renewed art of living.

Keywords Machinic articulations · Creative machines · Design practices · Cultural practitioners · Performance · Communication models

1 Activities of explanation and experimentation

Questions today regarding meaning, value, intentionality, and change seem to me importantly coupled with questions of how to live sensibly with others and the world. To put it another way, how are we—individually and collectively—to be responsive and responsible? A wide range of new and familiar voices is found joining in an ongoing conversation around these and related questions concerning practice and knowledge production, and their entanglement, as further

evidenced by the more frequent appearance of words like relational, enacted, dynamic, situated, responsive, and interactive. The corresponding turn away from representation, and toward a process-oriented notion of performativity, seems to be gaining momentum in many arenas as alternative modes of conceiving knowledge production are sought, and attempts are made to understand them. With work, and some luck, it may now be possible to attract responses from a richer diversity of participants, both inside and outside institutions, than perhaps previously considered permissible. In important ways, this renewed forum offers opportunities to profitably reengage with questions of value vis-à-vis matters of common concern. The significance of this cannot be overstated, as perhaps there has never been more pressing need to create openings for new vehicles for the articulation of sustainable, non-perspectival meaning-making activities that at the same time acknowledge a finite and contingent world. In a world where no possible (theoretical) fixed positions remain from which to take action, the activities of everyday life, situated in practice, show us that the choice of no action is equally impossible. For me, the very impossibility of an unproblematic Archimedean point in a world in constant flux, which at the limit may resist conceptualization and categorization, is enough to strike both wonder and necessity into the heart of [the] matter.¹ The mundane—and remarkable—fact of “keeping on keeping on” as it is manifested in practical matters yet may contain an indication of the processes that allow for meaningful individual

H. Smoak (✉)
Topological Media Lab (TML), Concordia University,
SGW EV 7–725, 1455 de Maisonneuve Blvd. West,
Montreal, QC H3G 1M8, Canada
e-mail: harrycs@harrysmoak.com

¹ Thinking with Deleuze and Guattari (1995), Bruno Latour (1993) and Prigogine and Stengers(1984), it may be that an anarchic generative force literally goes further down, that at the limit the universe resists conceptualization and categorization in a plane of pure immanence. This is an interesting and daring philosophical proposition, one I don't seek to affirm or deny here.

and collective change, change that is not wholly predetermined or dependent upon chance alone. Conceived within a matrix of care, the potential for life and for living is (theoretically) infinite.

As a student of artistic behavior, I have long been interested in the social, political, economic, and artistic transformations associated with the emergence of computational media and related technologies in the practices of cultural production. Some time ago, I adopted a view, one to which I remain committed, of artistic behavior and its attendant meaning-making behavior as taken from the American cultural historian Morse Peckham. Beginning with his assertion that the meaning of any sign (aesthetic, or otherwise) is its response, Peckham later refined his original formulation “the meaning of a sign is its response” to be “the meaning of a sign is the determination of the appropriate response,” for which there can be many since, thinking with Peckham, meaning cannot be immanent to a sign’s configuration alone (or sense data, to use another terminology).²

While I am not aware of any instances in Peckham’s writings on the relationship of the arts or efforts to control human behavior where he explicitly considers something like a technical object, he might have subsumed questions regarding the nature of our relationship to these under his broader view of the imperative function of signs. In regard to response behavior and interactions with computational machines, he would have likely considered what was significant for his project for understanding what was significant for artistic behavior, and for human behavior in general, had not changed a whole lot. Peckham wittingly offers no method for analysis that can be applied here. What remains useful is his insistence on response behavior as the proper locus for understanding the making and the un-making of meaning, his understanding of the power of our verbal and non-verbal explanations to control behavior and regulate desire, and his framing of experimentation as an artistic mode of behavior in relation to explanation. Taken as heuristics, these usefully inform my own investigations and practice involving experimental computational media systems for interactive media performance and installation events.

In following Peckham’s situation of experimentation and explanation, I do not wish to create an impression in the reader that somehow this apparent delineation between activities is intended to suggest a bifurcated experience of an underlying world. The association with the usual separation of theory and practices, mind and body, thought and

² Peckham (1977) wrote “Grace Andrus de Laguna said many years ago that the language coordinates behavior, I would go further to say that language controls behavior, and I would extend this to all configurations to which there is a response, that is to nonverbal signs as well.”

feelings—even representations and performances—misses the point. Which is to say only that, as I have come to believe, explanation and experimentation are different (even incompatible) modes of response activity, both of which are useful at different times, but for different purposes and across a wide application of activities that we can and do engage in.

Peckham usefully describes two kinds of activities creative artists, writers, filmmakers, scientists, philosophers, and other cultural practitioners are engaged in, suggesting what these activities can do for us. The first sort of cultural activity and the more prevalent, let’s call activities of explanation. To say more in outline fashion, our competent cultural practitioners provide us with (1) *examples* (that is, they engage in verbal and non-verbal response behavior yielding verbal and non-verbal configurations), (2) *instances* (the verbal and non-verbal products and processes of the techno-sciences, which point to non-verbal response behavior aimed at generating correspondence—making the real actual), and (3) *concepts* (the verbal articulations of our philosophers laboring to produce conceptual configurations and to elaborate categories). Similarly, the students of culture—teachers and critics—provide us with (4) *directions*, tracing the connections between examples, instances, and concepts through scholarship and the ongoing activity of canon formation. Activities of explanation are essential ordering activities; its practitioners are engaged in determining the limits or boundaries of the possible. Their primary function is the reduction of entropy or the fulfillment of type. To put it another way, cultural practitioners provide us with *instructions for performance* (Peckham 1979).

Let us call the second sort of activity (Peckham 1965) cultural practitioners are engaged in activities of experimentation. Here, practitioners are doing similar sorts of things as other cultural practitioners engaged in activities of explanation. Taken together, activities of explanation and experimentation are not necessarily formally distinct in their organization, nor are they institutionally differently situated from one another. The main difference exhibited in the case of activities of experimentation is that its practitioners and others observing them judge their sign-making behavior innovative from the dominant ideologies currently having the greatest influence. This poetic activity—in the sense of “making things new”³—can be verbal, as in metaphorical re-description and the ongoing transformation of language as it is used. And it can be non-verbal, in the sense of deploying new

³ For an extended and provocative explanation of the “poetic” and literary function of the philosopher in relation to the ongoing narrative of ideas in Western philosophy since Plato and Kant, see Richard Rorty’s work, in particular *Contingency, irony, and solidarity* (1989).

material, aesthetic, or perceptual configurations. At the highest level of cultural activities, where change and innovation are valued most, our innovative creators trace the invisible paths between (im)possibilities of wide application. For my purposes now, it is enough to say that rather than view something called Art as a separate and unique or institutionally bound cultural activity, I find it much more useful to think of *artistic behavior* as another important mode of human behavior in general, one that is particularly well suited to meeting the demands of a changing world.

In providing instructions for performance, our cultural practitioners provide clues to those who are trained to read and follow them for what is considered appropriate response behavior, even if that response is no response at all, or a clue that artistic behavior is expected. In my view, activities of both sorts are unique to the production-oriented practices of the media, performing, literary, or fine arts, and are to be found equally at play in the technosciences (at least in so far as they are practiced) and innovative institutional leadership. Further, is my belief they can be found in some degree throughout all levels of everyday and marked cultural activities including crafts, DIY, food, games—and especially in activities engaged in an amateurish fashion, that is non-professionally. And more, I hold that any act of perception can be an innovating act or a fulfillment of type in response to these instructions for performance.

2 Machinic apparatus

In his essay “Machinic Heterogenesis” from *Chaosmosis*, Félix (Guattari 1995) inverts the classical ontological priority of technology over machines, suggesting that machines are never merely expressions of technology or technique (know-how). Rather, what he calls technical machines are expressions of something processual and axiological which he calls the machinic. For Guattari, the machinic is something very different from what normally comes to mind when we think of something as mechanical. Fully considered its material apparatus as Guattari describes it, the machinic has a self-consistency that spans the physical, the biological, the affective, the symbolic, the social, and the institutional producing specific enunciative effect’s that are reproducible but are not themselves representational.

It is apparent that the machinic includes something more than a mere (mechanical) response to a stimulus. One approach I have taken to help understand what Guattari might be talking about is through the making of and thinking of proto-machines involving computational media systems utilized in experimental performance situations

toward the creation of events, or proto-events.⁴ In the course of this work, I have attempted to proceed with this description of the machinic as an alternative to the conventional communication models of interaction represented by the human–computer or human–machine interfaces typically put forward in the field of human–computer interaction (HCI) and its related disciplines.⁵

3 Creative machines

In order to situate it for future examination, I am interested in expanding a notion of computational media conceived within the context of the machinic apparatus as Guattari described it—as a situated, expressive material in collective association with human response behavior in the relational production of events that take into account the needs of the public (who importantly may be funding the research) as well as the needs of the researchers themselves. To proceed thusly necessarily requires setting aside questions that assume machines to be a class of objects unto themselves with an intrinsic technological nature, or language, which we must first meet and understand in its own terms, or it in ours, before constructively engaging with questions of interactivity. Moreover, this means setting aside quests for a set of properties or characteristics that make up something called a creative machine, or creative software, as a thing unto itself. In its place, I am favoring a stance emphasizing the processual aspects of the machinic for the “making of new things,” including new possibilities for alternative subjectivities and sensible inhabitations with the world.

So far, the conflation of meaning and behavior (including here what I am now calling machinic articulation) put forward at the beginning of this essay may seem to some readers oddly positioned, indeed containing a suggestion that I believe nothing can have meaning apart from the cognitive act of an individual human observer. Even worse, it may seem to others that I am implying that all value is radically bound with what only humans can create and construct. The usual argument for and against

⁴ Much of this work has been conducted alongside work projects undertaken with the Topological Media Lab and Dr. Sha Xin Wei at Georgia Tech (United States) and Concordia University (Quebec, Canada) since 2003.

⁵ For convenience and shorthand I have subsumed under the label HCI those models put forward more recently by human-centered computing (HCC), including computer mediated human–human communication models and its variations. The field of HCI itself is currently experiencing something of an taxonomical crisis as it tries to sort through the vastly different applications and multiple perspectives which have emerged in recent years vis-à-vis advances in information and computational technologies, as well as their expanding applications.

this kind of apparent relativism contains two presuppositions; I would like to acknowledge and discuss by way of further consideration of so-called creative, or intelligent, machines. The first is the assumption regarding the locus of value that holds only humans can participate in the creation of meaning. The second assumption stems from a view that the only possible actors are human, a position that I believe too hastily dismisses the productive role of non-human processes in the co-structuration of meaning. I will want revisit this last point later.

In consideration of artistic behavior employing computational machines that I think are interesting, essentialist questions that for the cultural moment inexorably seem to come up in discussions surrounding so-called interactive technologies, questions like:

“Where does creativity lie?”

and another one:

“Are computers creative?”

get in the way of a productive examination of the ways computational processes co-structure events. I think questions like the one proposed in the first instance (“Where does creativity lie?”) contain the same kinds of wrong-headed assumptions held by the sort of prevailing cognitive scientist, who looks to the neuronal structures of our brains and related computation models for representations of self or intelligence or creativity. In the second case (“Are computers creative?”), we might fruitfully replace a related question “Can machines create?” with another one: “Are there imaginable computational machines which allow for novel response behaviors in performance situations involving humans as well as nonhuman agencies.” Stated in this manner, it may be possible to fertilely interrogate the relationship between humans, machines, and the necessary conditions for innovative response in performance situations and profitably avoid questions like “Can a computer be artistic?” and “Can a computer be a productive collaborator?” as well as another pernicious set of questions represented by “Can a computer perform more efficiently than a human performer?”

In the case of designers who incorporate computational processes and techniques either in the so-called creative process or in the production of an event, questions like the ones put forward above (“Where does creativity lie?” and “Are computers creative collaborators?”) also seem to me be a variations of the author question. I only want to say that I remain sympathetic to a view that emphasizes the participatory role (and tremendous responsibility) of the observer in the determination of the final response to a work. This holds for the traditional examples of personal experience such as reading a book, listening to a musical performance, viewing a painting, watching a play—or any

other act of making sense in the world. In no case are there passive, in the psychological sense, responders—we are all collaborators to our meaning making.⁶ Passivity in this case is the limit condition for action. There are only varying intensities of experience, and more or less redundant response behaviors.⁷ The determination of an appropriate response, therein the meaning (and the experience) of the work, is innovative only in so far as there is a transfer of forces resulting in a change in behavior or attitude, otherwise it is only an partial repetition without difference—partial in the sense that no gesture of life once made can be made the same way twice.⁸

At the limit, this would seem to imply the designer’s intention itself is of no important consequence and in any case cannot be fully recovered though an act of responding—either interpretive or by way of some more direct means. However, I maintain a view that holds the designer’s intention is a (weak) force that shapes the form of the work and thus constrains in a real way the realm of possible responses from an otherwise virtual infinitude. In this, the designer has access to a (theoretically) infinite virtual} space of possibilities (and impossibilities) from which to select from and direct the form, and she maintains a hand in selecting the shape of its actualization, while acknowledging a dependency on the social, historical, and material conditions that constrain the determination of an appropriate response. Surely in this, the designer’s actual intent is influenced by her own history of responses to a neighborhood of other works (including her own), themselves situated within a cultural and material sphere—the always already network of contingent geographies and histories that form the stage where upon the work emerges, is performed, and intention is enacted.

4 Partial design practices

The designers, directors, artists, and experimental architects with whom I prefer to work share a sense of the vital

⁶ In his essay on Artaud—“The Theatre of Cruelty and the Closure of Repetition”—Derrida (1978) is careful to distinguish between the double Artaud (1958) wrote of and the kind of doubling, or repetition that takes place through “a frightful transfer of forces/from body/to body”, including the interiorization of a presentational act by way of its movement of thought. For Derrida this movement is “irrepressible.” The unrepeatable difference “is the enigma of that which has no meaning, no presence, no legibility”—no witness. Derrida seems to say in conclusion that representation—as the infinite repetition of difference—is a necessity without there can be no possibility of life.

⁷ For further discussion of the senses of intensity, see Brian Massumi’s “Introduction, Concrete Is as Concrete Doesn’t” (2002).

⁸ For Derrida’s Artaud, the theater is the only place where a gesture with the force of life can be made, and like gesture of life can be made only once (Derrida 1978).

importance of experiencing the work materially, before rushing a design decision too quickly based on their own or another's idea of it. Ideas too attractively presented, or requirements over-specified from the beginning of a project, can lead to premature design choices, suggesting the importance of partial approaches that allow for indeterminacy in at least two directions, that of the designer and the client. The English stage director Peter Brook in his well-known collection of essays on the theater, *The Empty Space*, writes, "The actor who is asked his views about a costume design before rehearsals start is in a similar position to the director who is asked for a decision before he is ready. He has not yet had a physical experience of his role—so his views are theoretical. If the designer sketches with panache—and if the costume is beautiful in its own right—the actor will often accept it with enthusiasm, only to discover weeks later that it is out of tune with all that he is trying to express." (Brook 1968) This phenomenon is well known to designers working with clients who are themselves not designers. The strategies for working around these problems of translation can be quite ingenious, depending as much on what is colloquially called "soft skills" as technical virtuosity. Experienced designers discern this through reflection on their own material experiences of thinking and making, knowing which decisions are important to delay as long as possible lest their articulations become merely theoretical and therein un-inhabitable. It is my conviction that architects and designers, along with the makers and builders, of the built environment would benefit greatly from a heuristic that involves thinking and feeling their designs as Peter Brook once characterized design for the stage, that is conceived as being all the time "in motion in relation to activity as it unfolds."

I remain committed to a view of research with claims to matters of common concern that stresses the importance of an engaged and lively public in all manners related to the experimentation itself. I believe it is a designer's responsibility to ensure the instructions for performance are adequate for meaningful participation from a wide and diverse array of forces. For my part, I am not interested in monastic practices and other pursuits of the holy that necessarily require an intensification and turning inward in order to directly approach their object. For in doing so, I fear they estrange their practitioners from the affairs of the world (including the practical affairs of conducting the research.). In the end, I think work undertaken in this manner produces work that is, for a large part, irrelevant.

One way of pointing, by way of words, is through fiction or storytelling. However, for these, the instructions for performance require less obligation on the part of the listener or reader to evaluate its success on the basis of a correspondence to a reality *out there* or to an intrinsic self

in here. At the present time in our cultural history, this charity toward certain kind words, either spoken or read, is more likely to be granted to the novelist or the ethnographer than to the philosopher or the scientist. This same charity is similarly extended to practitioners on artistic and theatrical stages, including not only architecture as well as the black and white boxes of the visual and performing arts, but also domestic interiors, fashion, and other domains of the applied and design arts.

In general, however, less "weight" is attributed to the applied and design arts, especially in terms of the kind of importance accorded to the high arts, and more recently science, by the usual cultural and political elite. By applied and design arts, I intend not only the traditional categories of hand crafts and decorative or ornamental arts, but as well the professionally recognized fields of industrial design, graphic design, fashion design, and media arts—among others. I also include the emerging computation arts (including here the digital or "new" media arts) and, increasingly, architecture as it separates from building and construction. In terms of cultural cachet (if not monetary reward, with the exception of certain stars), there remains a clearly recognized hierarchy of high and low in the arts. In terms of cultural significance, it could probably be said a similar view is maintained toward engineering and the applied sciences. Though, overall, a higher economic value is usually given to the latter due to the way our present society puts stock in instrumental efficacy.

On further consideration of the developments in the engineering and applied techno-sciences, the absence of a certain kind of seriousness—and sense of responsibility—may well be revealed by 20th century cultural historians as having been industries' greatest asset and liability. The result has been so much innovation, the wellspring of an indefatigable optimism (over and above higher capitalization!). The rush of invention, from the late 20th century to the present day, has not necessarily manifested itself in terms of the products we consume. However, it is easily evidenced upon consideration of the modes of production and distribution that have developed, as suggested by (i) the increasing adoption of computer assisted design and fabrication techniques across a host of industries; (ii) advances at multiple scales of material and biological engineering and science; (iii) advances in global logistics and distribution operations coupled with nearly ubiquitous telecommunications networks; and, more intimately, (iv) the reorganization of labor and development of sophisticated technologies for the mobilization and coordination of affect. All of this made possible in large part through the wholesale valorization of a wide array of (publicly funded) techno-scientific inventions, and there seems to be no end in sight. In the wake of this sheer productive force, it is difficult to remain merely skeptical of the practical efficacy

and influence of the professionalized disciplines. One look at the monstrous menageries presently on display on any given day in the product marketplace would seem enough to suggest at least one form of Artaud's crowned anarchy is already with us, given to us by continuous revolutions of the techno-sciences as they are practiced.

The enigmatic Paul Klee, referring to his teaching at the Bauhaus wrote, "As the ideal experimental station we would not be training new inventors that really were no such thing but only masks of inventors [...] rather, we would be able to transfer the results of our inventiveness to the body of the people. This new art could then permeate into the applied arts and produce an enormous flowering." (Wick 2000) I do not want to comment either way on "art as vehicle" for metaphysical revelation or redemptive purposes or discuss it for that matter. However, experimental research in design and computation arts conducted in the mode of art, with a corresponding emphasis on the creation and invention of new configurations which allow for innovative response behavior is far more compelling to me than to see it continue forward on its path as hand-maiden to existing consumption-oriented industries. I would like to see an experimental "lightness" retained in the applied and design arts kept together with an outward face of concern for both the human and the non-human.

5 Making new things

I would like to spend a few sentences disentangling for future consideration and interest a particular constellation of makers who are engaged in the larger context of critical and emancipatory efforts. More specifically, I am referring to those who are principally engaged in material (as opposed to figurative or literary) interrogations and transformation of our world and selves. To be sure, among these engaged in projects seeking conditions for meaningful individual and collective change, there can be found voices calling for a gradual, adaptive response situated principally within the realm of human affairs and rooted in consensus. But there are other voices, too, insisting on more radically empirical courses within an expanded constitution. It is not within the scope of this essay to examine the traditions of politico-theoretical interests at play here—and not everyone is necessarily engaged in explicitly political projects, at least not what is usually connoted by the phrase "politics as usual." For now, I just want to say that the work I value and aspire to seeks maximal accommodation for artistic behavior as I have described it here, as "making things new" and "making new things," toward an art of living actively engaged with matters of concern, in any mode of articulation that *adds* to the world rather than subtracts from it.

It is my belief that work that seeks to be inventive and creative, and at the same time seeks to involve the public or claims to have the needs of the public in mind, is necessarily obligated to put forward examples that take as much care in the crafting of instructions for performance as attending to a felt need to engage in experimental activities. For work that seeks to avoid domination over and control of the participants involved—work that wants to add something to the world and not just re-mix what is already there—I believe this means, in part, opening up the process of making and conceiving of work as widely and as early as circumstances allow. Otherwise the work risks failure on one or more of the following counts: (i) it is too obscure or random to be shared, lending a mystical or accidental qualification to the work; (ii) it is overwhelmed by one or more competing or improperly addressed conditions, either an expectation of the audience, a condition of the context in which it is presented, or more general problems with production that undermine its effectiveness; or (iii) the work is appropriately understood, but itself grossly misunderstanding or unconcerned with the audience or the site where it is situated. What is at stake for the public is often diverse and nuanced, especially when what is involved is the reconciliation of the requirements of interdependency and a simultaneous need for autonomy. It is my belief that research claiming public interest must be outwardly focused in a manner that embraces this diversity of needs in a similarly nuanced way that also takes into account the diversity of needs of the researchers themselves.

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