Diagrammatic Media

Subjectivity—Ecology—Event

Generating Organizational Techniques Through Creative Practice for a Post-Media Era

by

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ABSTRACT

This dissertation charts another path for Media Arts and Sciences (MAS) by generating institutional and creative research practices working against logics of integration and extraction. Drawing on activist, psychoanalyst, and philosopher Félix Guattari, I use institutional analysis to model how MAS came to inherit legacies of 1970s cyberlibertarianism and digital utopianism, which disavow politics in favor of technocratic interventions. I also identify the homogenizing and reactionary political and disciplinary consequences of MAS's embrace of integrative modes of interdisciplinarity.

Responding to integrative and technocratic MAS, I argue for re-consideration of politics in MAS through an approach to research, creation, and practice informed by Guattari's concept of diagrammatics. Diagrammatics emphasizes the centrality of subjectivity in crises of mental, social, and environmental ecology. Through creative practice with computational media, art and technology, and social design, I work towards a practice-driven notion of diagrammatic media.

I outline media diagrammatics as an intertwining of extensive engineering of concrete machines (artmaking, systems building, bookmaking, event making) and a speculative engineering of abstract machines (dreaming, conceptualizing, modeling, critiquing, analyzing, actualizing, virtualizing). In this sense, diagrammatics mediates mental and social individuations between a pre-individual and an individuation. Diagrammatic media objects (e.g., a radiophonic

aberrance in the electromagnetic field, a book, an autumn leaf) are lures for thinking-feeling embedded into a diagram. Diagrammatic media proposes we stop thinking in terms of computational media systems altogether and begin thinking about diagrammatic assemblages of concrete and abstract machines.

A prototype of a tangible media-rich operating system called diagrammatic elucidates the complexities of the relationship between lateral thinking, moving, and feeling in learning and writing. I outline ways the prototype could be brought into a slow network that speculates on new modes of collaborative writing. Portacular Resonances, a radiophonic media installation, drives a Sci-Phi endeavor orbiting contemporary anxiety differently: as a clue for cosmic becoming spiraling out of the reactive affect of alienations and emotional capitalistic exploitation and into a potential collectivizing force. Finally, through the Guattarian concept of the machine, I ask how potential becomings are embedded through gathering events such as SloMoCo, a slow conference for artist researchers.

DEDICATION

I dedicate this work to my friend in thought and life Zach Thomas (1980-2021).

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CHAPTER 1

INTRODUCTION: ANOTHER MEDIA ARTS AND SCIENCES IS POSSIBLE

Diagrammatic Media Arts (and Schizoanalytic Sciences)

Media Arts and Sciences (MAS) assembles a transdisciplinary nexus of research and creative practices in arts, human-computer interaction, engineering sciences, and media studies. MAS emphasizes that the ability to analyze and create with emerging technologies is key to making meaningful change in the modern world. It suggests that by identifying inflection points in complex social processes, one may then use their experimental design and making practice to effect positive interventions. But the institution that founded the first MAS program, the MIT Media Lab, recently found itself embroiled in a multifaceted political controversy raising questions about the means of enacting meaningful change, and indeed what constitutes meaningful change altogether. Historian of science and technology Orit Halpern wrote an editorial entitled "A History of the MIT Media Lab Shows Why the Recent Epstein Scandal is No Surprise" (Halpern, 2019) in which she interrogates the game theoretical dilemma of the Media Lab imperative slogan ("Demo or Die!"[1]), the lab's corporate sponsorship model, and short-sighted approach to complex problems.[2]

The Media Lab's crisis comes in the wake of mounting disapproval of technoscientific optimism from not only academic critics but also the broader public.

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[1] Later this slogan was changed to "Deploy or Die!", and finally to "Deploy!" at the recommendation of then President Obama during visitation (Ito & Howe, 2016).

[2] The latter category has been criticized elsewhere, see (Ames, 2019).

While the public is concerned with corporate actors and failing regulators, other discourses revolve around the entrenched assumption that, in one way or another, technology will save us from our problems. "Technoutopianism is dead" proclaims the subtitle of a recent Science and Technology Studies (STS) essay collection (Mullaney et al., 2021). A constant barrage of techno scandals in recent years have amplified the alarms sounded by the broader STS community about the interwoven crises of cybersurveillance (Zuboff, 2019), algorithmic governance operating de facto in the vacuum of state governance and the acceleration of system oppression in computational social, political, and economic infrastructure (Chun, 2006; Galloway, 2006; Pasquale, 2015; Bridle, 2018). Public policy campaigns and Netflix documentaries indicate a mounting skepticism of the optimism that drives technoscience.[3]

Despite calls to abandon Media Arts and Sciences, many do not seem to feel the need to critically consider their disciplinary arrangement. While the Epstein scandal has certainly been a moment of reckoning for the MIT Media Lab, MAS and adjacent arts and technology spaces also deserve scrutiny. In the time of virality, it is fitting to ask: have we caught something along the way? How much of our work has been over-determined by witty false dilemmas?[4] Following Arundhati Roy, if the pandemic are

[3] For example, in 2020 Netflix produced a documentary called *The Social Dilemma* highlighting voices from the public digital humanities and the techworld sounding the alarm about profit-motivated algorithmic extraction and the social and mental stakes of technocratic means of organization. Run by design, computer science, art, and technology scholars Joy Buolamwini and Sasha Costanza Chock, the not-for-profit Algorithmic Justice League (AJI) addresses algorithmic bias within the framework of social justice through public facing talks, a Netflix produced documentary film, and popular and academic writings.

[4] In full fairness, even my own school had its own violent injunction "program or be programmed" printed on tee shirts, a nod to the book by public technologist Douglas Rushkoff (2010) and perhaps a punch-up of the Media Lab slogan.

portals, perhaps it is time to determine what's worth bringing along (2020). As a way of setting the stage and articulating the stakes of my own engagement with MAS, this dissertation's introduction provides historical and genealogical context by asking: "How did we get here?"

Albeit in a different context, this is precisely the question that guides the schizoanalytic practice of philosopher, psychoanalyst, activist Félix Guattari. Guattari worked with patients with psychosis at the experimental clinical La Borde outside Paris from the 1960s until the end of his life. Guattari worked beyond the limits of Freud-Lacanian psychoanalysis, developing analytic treatments not only for those suffering neurosis but also psychosis. He developed the schizoanalytic practice which "tries to understand how it is that you got where you are" (Guattari in Watson, 2011, p. 8). In this practice, the patient and analysand work together to build new models that prove useful to the patient's thriving (Watson, 2011, p. 9). To this end, we can understand this genealogical analysis and the interventions that follow in this introduction as a schizoanalysis of MAS.

Cyberlibertarian Tendencies

Starting in 1968, we find a counterculture-cum-cyberculture glistening with psychedelic optimism, Whole Earth utopianism, and technofluent new communalism. As a particularity of the counterculture's rejection of 1950's white suburban conservativism, these technolibertarian tendencies raise up the sanctity of the individual ("do your own thing, man") (Roszak, 1995). Historian Fred Turner interweaves the disintegrating threads of the post-political psychedelic utopians of California Counterculture of the

1960s and 70s with the nascent technological revolution of Silicon Valley (Turner, 2006). The new cyberculture rebukes politics in favor of techno-utopic cosmic aspirations stemming from bottom-up, bootstrapping organizations. The year 1968 bore fruits to this end. Douglas Engelbart's infamous Mother of All Demos not only promised but demonstrated an imminent personal computing system that embodied his project of "augmenting human intellect" to grapple with complexity[5]. Jasia Reichardt's *Cybernetic Serendipity* art exhibition (Reichardt, 2018) exposed 60,000 people to what the computers created for the military could do for art—and in turn what arts could do for military-funded technology. Stewart Brand's Whole Earth Catalogue distributed and sold books, equipment for going off the grid, and later launched a proto-internet. The name of Brand's catalogue is a reference to his 1966 campaign to NASA: "why haven't we seen a photograph of the whole earth yet?", motivated by the belief that seeing a picture of the Earth from space "might tell us something about ourselves," "might tell us where we're at" (Fulton, 1994). Engineer and artist Frank Molina published the first issue of *Leonardo*, a seminal art-science journal that took as its primary function "serving as a channel of communication" for experimentalists, engineering (increasingly computer engineering) and artistic practice (McCray, 2020).

These events help us to recognize the sedimentation of a new subjectivity which would later give rise to Media Arts and Sciences. Simply put, the model for this subjectivity is technolibertarian, as far as it posits that we need the right tools to create

[5] For more on Engelbart's project of "human intellect augmention", see (Bardini, 2000).

agency. Tools enter a new scale via the cybernetic science of complexity: an individual is empowered by technics to make artful interventions in a complex and interconnected world. Such thinking is embodied in the objective of the flopped One Laptop Per Child project (Ames, 2019; Kraemer et al., 2009), which designed and produced an inexpensive computer to distribute to children around the world.

After the birth of the entrepreneurial scientist spurred by the Bayh-Dole act, these characteristics are inherited into an academic context by MIT Media Lab by founder Nicholas Negroponte. Two years after the founding of the MIT Media Lab, Stewart Brand wrote about with adoring fascination *The Media Lab: Inventing the Future at MIT*, in which he describes how the spirit of his generation is being carried on a bigger and more robust scale (Brand, 1987). Turner writes how Brand observed how the Lab interrogated "both those human networks and their relationship to information technologies as prototypes of a simultaneously cybernetic and New Communalist social ideal" (Turner, 2006, p. 179).

In its affiliation with prominent research institution MIT and massive corporate-endowed budget, that ideal clearly reaches a new institutional prowess with the Media Lab. Brand does not seem concerned with what has been lost from the original countercultural aspirations in this transformation. But Guattari's summing up the situation in the late 80s passes today as much as then: "wherever we turn, there is the same nagging paradox: on the one hand, the continuous development of new techno-scientific means to potentially resolve the dominant ecological issues and reinstate socially useful activities on the surface of the planet, and, on the other hand, the inability

of organized social forces and constituted subjective formations to take hold of these resources in order to make them work" (2005, p. 31).

MAS Proliferations: New American Integration

Since the MIT Media Lab started its MAS PhD program, universities across the world have created MAS or similar graduate programs to foster novel transdisciplinary practices engaging with emerging technologies: Indiana University and Arizona State University have MAS PhD programs, while Wellesley College offers an MAS undergraduate degree. These and myriad programs with similar names point to a coalescence of interest and investment in the affordances of transdisciplinary figurations of art, media, technology, and research.

These institutions go beyond the rhetoric of Demo or Die, inflecting the transdisciplinary and technical pragmatism of MAS in their own way through unique cohorts of faculty, staff, students, space, and resources. What are we talking about then we say MAS? It is not a canvas onto which we can project whatever we want. I do not wish to paint this with a broad brush, but, as I propose to show, there is a shared epistemological and political economic genetic code between these manifestations which we can trace back to cyberlibertarian rhetoric. We find this particularly in:

1) the instrumentalization of tools and technology towards an empowered world

2) the compulsion to disrupt disciplinary enclosures so to create more integrated experiences and modes of inquiry

3) a near total rejection of politics (both as instantiated in organizational praxis and critique)

Let us show how this is born out in the conceptual figure of *integration* in the writings of theorist, practitioner, administrator, and architect of the MAS PhD at ASU Thanassis Rikakis. Rikakis defines Media Arts and Sciences as "the emergence of a truly integrative hybrid physical-digital culture, which will require the broad integration of knowledge across engineering, arts, design, humanities, and the social sciences" (2013, p. 46). As such he makes an instrumental injunction common in contemporary academic discourse to make a case for inter-, trans-, or multi-disciplinary work. In the realm of media, our world is complicated by ubiquitous computing, immersive social media, and algorithmic governance. He argues we need new theories and practices to produce novelty commensurate to the pre-given novelty which are called problems in our world. Rikakis et al. targets the lack of a culture (i.e. a digital culture) sufficient to the ingression of digital techniques, workflows, paradigms, etc. as a major psychological, epistemological, and even (via value) economic roadblock to rallying interdisciplinary problem-solving to address global stumbling blocks.

Culture allows Rikakis to employ integration as an operator across three registers: First, integration of various computational modalities into hybrid systems. Second, an integration of disciplinary practices, and finally, an integration of experience and knowledge. Technically integration describes an approach to creating environments with computational sensing and synthesis, commonly called ubiquitous computing. He describes experiential computational systems as "systems that integrate computing and digital media with the physical and social experience" (2013, p. 47).

Integration also implies the multidisciplinary processes at work in designing interactive systems drawing together optimization and meaning (where optimization is code for engineering and meaning making is code for art practice). This is a microcosm of arts and technology discourse: “the aggregate experience that experiential media produces needs to integrate optimization with contemplative value and quality of experience in terms of both sensory engagement and depth of meaning” (Rikakis et al., 2013, p. 53).

Finally, integrated knowledge is the product of interdisciplinary practices using computational media systems: “The main goal of these hybrid media systems is to facilitate and enhance an individual’s experience in a way that will lead to more integrated knowledge” (Rikakis et al., 2013, p. 47).

Emphasizing interdisciplinary practices’ possibility to provide “openness of the contemporary historical situation”(Born & Barry, 2013, p. 5), these aspects of Born and Barry’s characterizations echo the sentiments and perspectives of MAS. They caution us however against instrumental rationales like Rikakis’s which position interdisciplinary knowledge production practices as coordinated responses to the necessities of the world.

Rikakis uses integration playfully, so there is a danger of reification or equivocation if integration is taken too seriously. However, the Integrative Graduate Education and Research Traineeship (IGERT) from the NSF that funded research at ASU AME from 2005-2008 seems to be the genesis of experiential media systems emphasis on integration (Rikakis et al., 2005). As Born & Barry point out, policy and funding assumes an integration and synthesis of disciplines on equal footing (Born & Barry, 2013, p. 10).

Indeed Born & Barry argue that economics is too often a driver of the instrumentalization of interdisciplinarity towards the increasing complexity of society.[6] This instrumentality sneaks market demand in the back door as the "new value system" Rikakis proposes. The potential for novel and inventive approaches to wicked problems[7] enabled by interdisciplinarity, appears to us at first as open and self-determined, is easily guided by invisible hands if such a value system permits it.

Given the instrumentalization of MAS seen in (Rikakis et al., 2013), we might ask: what it is exactly that is being integrated? There is good reason to feel uneasy about the word: *integration* has become a corporate speak euphemism for redundancies, and the collective humiliation of striving for *work/life balance* has been replaced by term *work/life integration.* Integration figures as a primary operator in Guattari's analysis of modern post-industrial capitalism. Production is constantly absorbing increasingly divergent subjectivity into a more complete machine. Guattari calls this Integrated World Capitalism (IWC). It is characterized here by Gary Genesko as:

> …a minimal model of global and post-industrial capitalism in which three evaluative terms are used: 1) processes of machinic production; 2) structures of social segmentation, considered in terms of the state; 3) dominant economic-semiotic systems, considered in terms of the market. This mode of capitalistic valorization is described on the basis of the order of priority given to the terms, in this case, production-market-state. The key features are that the production is more and more decentered and focused on signs and subjectivity, and that the capacity to integrate and exploit social diversity is unprecedented. (2013)

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[6] The instrumental characterization of interdisciplinarity may create space to indulge a temptation cautioned against by Born & Barry: "to imagine that interdisciplinarity is historically novel – that in the past knowledge production has primarily taken place within autonomous and unified disciplines, and that it no longer does so" (Born & Barry, 2013, p. 3).

[7] Wicked problems were defined by (Rittel & Webber, 1973) as problems that reconfigure themselves when you attempt to solve them.

Embedded inside the machinic production of value via attention and affective extraction that is 21st century capitalism, integration functions in a different scope than the purely affirmative rhetorical connotations and corporate speak resonances. Guattari's concept inscribes an exploitative dynamic of capture and mutation that grows on diversity. Integration is always a relaxation of political, social, and disciplinary tensions that animate diverse ecologies, including more-than-disciplinary practices. Like Buckminster Fuller's term synergy, integration erases what is discarded in the integrative operation. The horror of being assimilated by the Borg is not being consumed and reassembled, but realizing what of you is being excluded.

What Is to Be Done? A Post-Media Era and a Subjectivity to Come

In this dissertation, Guattari not only allows us to grasp the situation in terms of a negative critique, but also furnishes the project with a pragmatics immanently relevant to creative media research practices. Like much of Guattari's work, this pragmatics focuses on subjectivity, which we can understand as "an abstract or general principle that defies our separation into distinct selves and that encourages us to image that, or simply helps us to understand why, our interior lives inevitably seem to involve other people" (Mansfield, 2000, p. 3). From the 1970s onward, Guattari speculated on the potentials of emerging media technologies to help bring about one of his central philosophical, clinical, and activist aspirations: the formation of new subjectivities. The growing ubiquity of media systems figure prominently both in Guattari's diagnosis of normalizing subjectivity as well as his aspirations for new heterogenic machines—processes that produce more difference and refuse integration (Guattari, 1995, 2005, 2008, 2013b). In fact, we can

understand his differentiation between oppressive and liberatory processes of subjectification through different approaches to media systems. Guattari differentiates between two forms of subjectivization: mass subjectification and molecular (or minor) subjectification. The first category he describes as mass subjectivity, capitalistic subjectivity, or mass-media subjectivity. He writes that capitalistic subjectivity "is engendered through operators of all types and sizes and is manufactured to protect existence from any intrusion of events that might disturb or disrupt public opinion" (2005, p. 50). He describes mass media as a "deadening influence […] to which millions of individuals are currently condemned" (1995, p. 5) and critiques the subjectivities of mass-media manufacture "as synonymous with distress and despair" (2005, p. 34). Capitalistic subjectivity is characterized as dominating and oppressive, and yet he recognizes that the production of mass-media subjectivity is not strictly top-down or centralized. IWC "tends increasingly to decentre its sites of power, moving away from structures producing goods and services towards structures producing signs, syntax and—in particular, through the control which it exercises over the media, advertising, opinion polls, etc.—subjectivity" (2005, p. 38).

In his later works such as *Chaosmosis* and *The Three Ecologies,* Guattari's criticism of mass-media subjectivity is matched by an affirmative and creative project resisting IWC and forces of mass subjectification. A second mode of subjectivity possesses these works. This broader project he calls ecosophy: a practice of knowing and a praxis of becoming in three eco-logical inflections of subjectivity (the mental, social,

and subjectivity). It is a creative and post-psychoanalytic mode of working with ecological subjectivity.[8]

Media, or more specifically "post-media" plays an active role in the conditioning and construction of these three ecologies:

> Technological developments together with social experimentation in these new domains are perhaps capable of leading us out of the current period of oppression and into a post-media era characterised by the reappropriation and resingularisation of the use of media. (Access to data-banks, video libraries, interactivity between participants, etc..). (1995, pp. 5–6)[9]

In response to Guattari's post-media concept, which is somewhat nebulous (Goddard, 2013), many have asked: what will this post-media era look like? This question is complicated by the passage of time since these writings; at first, readers may mistakenly conclude that the age of Web 2.0 (and 3.0) represents a transition from mass-media to a post-media era by eliminating gate keepers and increasing accessibility. Afterall, don't we have access to databanks in Google, video libraries in YouTube, and interactivity between participants in TikTok, Facebook, and Twitter? Though Guattari died before the widespread media decentralization of the Web 1.0, we can dissuade ourselves of any

[8] He writes of (mental) ecosophy that "Its ways of operating will be more like those of an artist, rather than of professional psychiatrists who are always haunted by an outmoded ideal of scientificity" (Guattari 2005, 35).

[9] See a similar passage from the *Three Ecologies* which implicates social ecology as a particular site for the strategic incorporation of post-media: "An essential programmatic point for social ecology will be to encourage capitalist societies to make the transition from the mass-media era to a post-media age, in which the media will be reappropriated by a multitude of subject-groups capable of directing its resingularization" (2005, p. 61).

misreading that Guattari would have thought the social media of Web 2.0 was anything but another site of packeting out more mass-media subjectivities.[10]

Guattari's dynamically and ecologically intertwined media, subjectivity, and institution creates a lure for rethinking / reworking MAS through a (micro)politically inflected post-media. For Guattari, subjectivity is not defined in opposition to objectivity, but functions as a domain of dynamic and metastable mental information and ecological becoming. Engaged with contemporary psychotherapy and trained in the theory and practice of psychoanalysis, Guattari contends that subjectivity cannot be matched against a pre-given already identified in a structuralist system. He writes:

> Rather than speak of the 'subject', we should perhaps speak of components of subjectification, each working more or less on its own. This would lead us, necessarily, to re-examine the relation between concepts of the individual and subjectivity, and, above all, to make a clear distinction between the two. Vectors of subjectification do not necessarily pass through the individual, which in reality appears to be something like a 'terminal' for processes that involve human groups, socio-economic ensembles, data-processing machines, etc. Therefore, interiority establishes itself at the crossroads of multiple components, each relatively autonomous in relation to the other, and, if need be, in open conflict. (2005, p. 36)

Subjectivity is produced in a configuration of social, environmental, economic registers also in flux. It is not co-equivalent with the body, the brain, or the psyche. While it may have something to do with "my subjective tastes or opinion", it is never really "my" subjectivity. The ecology of subjectivity encompasses processes activating humans and

[10] Guattari's criticism of mass media is not unique. His mention of public opinion rhymes with Noam Chomsky's much better-known reading of Edward Bernays and Walter Lippmann in *Manufacturing Consent: The Political Economy of Mass Media*. Given Guattari's extensive engagement with Chomsky in his area of linguistics (see "Postulates of Linguistics" in *A Thousand Plateaus* (Deleuze & Guattari, 1987)), it seems clear this is Guattari's nod to the Chomsky's 1988 take on mass-media.

non-humans (and not necessarily either). Far from a holistic or organicist system in which parts "work together", Guattari's ecology is comprised of components of subjectification that work autonomously, and indeed even in conflict with one another.

Diagrammatic Media: Another Media Arts and Sciences is Possible

In this dissertation, examples from my creative practice with computational media help me to think through the speculative post-media era and resituate Guattari's peculiar and critical techno-optimism in the 2020s, an era in which decentralized media computation is a primary means of both producing and exploiting subject groups. I furnish my media art practice with an array of concepts scavenged from Guattari's own work, principally the figure of the diagram and the practice of diagrammatics. In the semiotics plateau of *A Thousand Plateaus,* Deleuze and Guattari speak about diagrammatics as a particular kind of transformation that "blow[s] apart semiotic systems or regimes of signs", where a regime of signs is "any specific formalization of expression" (1987, p. 136). Here the diagram does not function as a representation of a system or a process. We are used to encountering representational diagrams visually (e.g. as instructions in flatpack furniture packages, in historical documents describing the steam engine, in an anatomy textbook, etc**.).** For Guattari, an Ikea diagram enacts a visual perceptual machine, setting abstract machines in motion, which activate concrete machinery such as skeletal and muscular systems, flatpack furniture cubes, and tiny hex wrenches. In other words, to diagram Ikea furniture in a Guattarian way, we would need a larger diagram. Guattari abstracts the diagram from visual, animating the movement of thought as well as the perceptible. As a more-than-textual writing (as the etymology of

diagram emphasizes), diagrammatics resituates representational diagrams in a new constellation that prerenders possibility for unfolding.

To return to the question of Media Arts and Sciences, working between disciplines, and socio-economic entanglements, diagrammatics and more specifically diagrammatic media is useful it sets the stage for, as Simon O'Sullivan writes, "allow[ing] for hitherto 'illegal' connections and syntheses to be made" (2015, p. 21). I distinguish this diagrammatic illegality from the connections and syntheses encoded into market rhythms of disruption and integration found in contemporary start-up and venture capital culture. They have different effects in the world and produce valuations which are different in kind.[11]

Diagrammatic syntheses transgress disciplinary boundaries not just by creatively misreading disciplinary proclamations but also by appropriating disciplinary axioms and placing them in dissonant conjunction with one another. We should also understand this in opposition to integration, which attempts to create a legality through a relaxation of disciplinary tensions.[12]

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[11] In the essay "A Molecular Revolution", Guattari writes of the so-called third industrial revolution: "the system of production seems to reinforce the alienating constraints on work, as if for the sake of it, even in the most modern, the most automated of branches of production! Technical and scientific development as a whole tends towards the liquidation of fragmented, production line work, of the despotism of the jobsworths, and to a profound reorganisation of the break between hourly and monthly paid work on the one hand, and that of technicians and managers on the other. In reality the discipline and hierarchy that were essential to the 'armies of workers' of the twentieth century, only correspond today to the maintenance of repressive relations of production" (2016b, p. 57).

[12] I'm grateful to Phillip Thurtle for helping me to understand integration though the example of Ferenczi's practice of bioanalysis.

Guattari's related concept of metamodelization (Guattari et al., 1995) helps us to understand what O'Sullivan means by illegality, which may over code to legalistic structures. Metamodeling has been taken up by Guattari and his many readers in various traditions in more-than-clinical contexts towards an interdisciplinarity. Indeed, metamodeling helps make sense of Guattari's omnivorous intellect, which set itself to philosophy, leftist and autonomist politics, psychoanalysis, cybernetics, physics and mathematics, linguistics and semiotics, literature, music, art, ecology and biology, media and the early internet, and even science fiction.

For Guattari, structures are always in movement, and might be better described with his language of machines. These machines are made in the moment, they exist in our head and in the world. We touch them, think them, feel them, we remember them, or rather they re-member us. Guattari's system of metamodelization responds to structuralist accounts of meaning and signification, seeking to "make nuclei of virtual autopoiesis discernible, in order to actualize them […] rather than moving in the direction of reductionist modelizations which simplify the complex, will work towards its complexification…" (Guattari et al., 1995, p. 61). These activated machines delve into the virtual and catapult into the actual—a moment we might colloquially understand as "inspiration striking". Depending on affective contexts, such a confluence of events may also be the moment at which an anxious spiral commences, or when suddenly everything makes sense.

Philosopher and artist Erin Manning evokes Guattari's meta model to contour the (anti)method of her research-creation practice and the activities of the SenseLab. She

writes that the metamodel "upsets existing formations of power and knowledge" by "actively [taking into account] the plurality of models vying for fulfilment" (Manning, 2016, p. 43). For Guattari, all models are permissible in metamodeling so long as they are not universalizing. Such a view suggests a structuralism which is always already post-structuralist.[13] In sum, we can understand the practice of diagrammatics as the constellation, rendering, animation, and population of a non-linear and heterogenous modelizing space.

Diagrammatic complexification can inform a new set of ambitions and potentials for Media Arts and Sciences. In this dissertation I intermingle an amalgam of techniques from media, art, and science to produce a metamodel of post-media research-creation (and post-Media Arts and Sciences) called diagrammatic media. A practice of diagrammatic media would carefully and irreverently steal computational media artifacts, processes, procedures to generate new baroque consistencies sufficient to an emergent subjectivity. That coherency and media participation in that consistency, may be called diagrammatic. Diagrammatic media enacts an ecology of practice, techniques, and approaches (contra inter- and trans-disciplinary models) as both a media arts and organizational practice.

The chapters of this dissertation begin to bear out how diagrammatic media engages differently with practice than disruptive or integrative approaches to MAS by centering subjectivity, ecology, and event. In the section below, I outline the three body

[13] This has consequences for understanding Guattari's investments in psychoanalysis. For example, in the text the *Three Ecologies*, he writes that we might regard Freud's famous *Interpretation of Dreams* as "an extraordinary modern novel" rather than as a treatise (2005, p. 37).

chapters of the dissertation and motivate them towards the media arts and organizational practice of diagrammatic media. Each takes a different approach and scale to the problematic posed by post-media and ecological subjectivity. Each project attempts to set out as a prefigurative practice that takes seriously the event of the production of subjectivity, which Isabelle Stengers characterizes as when "what has been silenced or derided finds its own voice, produces its own standpoint, its own means of resisting a moral consensus, or a settled definition of what must be taken into account, or for granted. The importance of such events is hard to overvalue" (2008, p. 38).

Chapter Summaries

The next chapter produces a concept that interpolates between and moves beyond discourses of brainstorming and bodystorming. The concept of the BwOdystorm elaborates an embodied and subjective experience of learning, writing, connecting, and (re)membering with media objects. This concept motivates the research and development of a responsive media system prototype called *diagrammatic*. I discuss *diagrammatic* and the BwOdystorm through anecdotes from teaching, film, and literature, and in the context of the pandemic. The work is situated through a review of literature from areas around computation and culture, intertwining design values and philosophical context with discussions of what is called waves or tendencies in HCI. Second, I describe the diagrammatic system's design aspirations, its current implementation, share situational experiments with the prototype, and outline potential future work.

The third chapter is a black mirror of the first; the lateral connections and movements of thought spiral into anxious alienations and ruminations. The chapter

situates anxiety as the reactive affect driving emotional and cognitive capitalistic exploitation. Following feminist activist thinkers, I posit anxiety as a potential collectivizing force and demonstrate the beginnings of such a reversal with a creative Sci-Phi endeavor with computational media art through the cosmos of anxiety.

The fourth chapter introduces the Guattarian concept of the machine, which provides a framework for understanding organizations and events socially, mentally, and affectively. These theories help me to elaborate the SloMoCo project, a slow conference for artist researchers interested in movement and computing and a durational design research project in organization building. In the second place I describe a structured research interview I conducted with ten SloMoCo participants to gain a richer understand of the transformative power of gathering with respect to what potentials are embedded (and how). To contextualize this study, I relay research about the conference as well as literature on design research as both knowledge production and worldmaking apparatus. I conclude by describing my own creative synthesis of the interview data and share what that process revealed about my research question.

I conclude this dissertation by first revisiting more directly media diagrammatics, hazarding another account of what is mediated by the diagrammatic media object. I elaborate media diagrammatics through the distinction between abstract and concrete machines and produce a definition of an adjacent practice of speculative engineering. These practices begin to flesh out the more-than-disciplinarian aspirations of diagrammatic media and motivate the continued research and experimentation with

alternative institutional containers for this work before laying out the challenges such a project would face.

CHAPTER 2

DIAGRAMMATIC BWODYSTORMING

This chapter focuses on a digital-physical media system called *diagrammatic* that uses fiducial markers to track physical objects on a table or wall. A person can digitally bundle media objects (images, text) to these markers which are projected back onto the physical surface. This system is lured by a more radical transdisciplinary thinking and making suggested by Guattari's diagram (De Landa, 2000; Panayotov, 2016). The (post)pandemic environment, with its perverse relationship to the home and privacy, offers another motivation (Berardi, 2021; Coccia, 2020).

Through the development, experimentation, and theorization of the *diagrammatic* system, this chapter engages several questions that have motivated my PhD: what does it mean to do theory and practice together and what are the modes of expression sufficient to both?[14] If learning and thinking always exceed the containers we set up for them (classrooms, learning management systems, the book), how can these excesses make learning and thought more meaningfully social without regressing into the manic energy of contemporary social media platforms? How can digital and physical objects (CDs, mp3s, a digital image, a Casio watch) mediate beyond the sender and receiver schema? Is there a conception of mediation in relationship to the production of subjectivity? If diagrammatics is the practice of building subjectivities, what are the mediatic conditions

[14] See *Life after New Media: Mediation as a Vital Process* by Sarah Kember and Joanna Zylinska (Kember & Zylinska, 2014)

sufficient to that practice? If not a drive to organize and contain, what drives media diagrammatics?

The first section of the chapter contextualizes my *diagrammatic* prototype and its aspirations within diagrammatic systems coming from diverse backgrounds: human-computer interaction, constructivist education, and experimental electronic literature. I consider historical digital-physical media systems' relationships to ecological thinking. A discussion of power and knowledge mobilization in Vannavar Bush's ursystem *memex* precedes an overview of HCI systems for table-top learning. I characterize the later HCI examples in terms of second and third wave HCI. This widely used framework of three waves (Bødker, 2006) or paradigms (Harrison et al., 2007) within HCI gives traction on the various concerns that motivate these research in design and engineering, and also provide conceptual nodes for code-switching into the diagrammatic conceptual framework.

In addition to table-top environments, I discuss projects and streams of work that resonate with diagrammatics, including Seymour Paper's constructionism and the computational learning systems for children such as the geometry turtle and LOGO (1980, 1993). The discussion and his coinage "mindstorms" set up a critical conceptual intervention which follows the description of my own system. In this first section, I also introduce the concept of the "authoring system" from the communities working in experimental electronic literature as a key touchstone connecting emphases on play and leisure from third-wave HCI and constructionism with artistic expression. These technical, cultural, and scientific contexts set the stage for theoretical reflection in a later

section.

I describe the technical implementation of *diagrammatic* as well as key features. I conclude by extracting implications for future developments and institutional analysis by reflecting on the system via theories of ecological subjectivity: Guattari's diagram, Sigmund Freud's theory of cathexis, Thomas Lamarre reading Vannevar Bush, Seymour Papert's computational constructionism, and Deleuze and Guattari's concept of the Body Without Organs.

Two Observations on Learning and Relating in the Study of Digital Culture

Learning Interstices

Media Arts and Sciences programs encourage students to develop critical, creative, and technical thinking skills.[15] Each student's unique interplay of these processes informs their individual creative practice. What is more, this creative-critical-technical dynamic is always already inflected by a student's spontaneous recollections and connections to the world beyond and before the classroom. However, the dynamic interplay of these processes is rarely explicitly thematized in educational environments. There is no express space for connections between concepts to be drawn. If students are lucky, they will discover their peers and teachers have been bushwacking trails for years between regions of thought and practice. In some cases, the trails have become well-

[15] My own program recently composed a new description of this transdisciplinary approach under the rubric of "technofluency": "The School of Arts, Media and Engineering educates the **next generation of learners** and empowers them with **technofluency** – its development, application and implications. The School of Arts, Media and Engineering prepares students to be **socially aware**, **critically thinking** global citizens who strive to bring about positive change in a society that will be increasingly **shaped by revolutions in new technologies.**" Emphases in original .(*Arizona State University School of Arts, Media, and Engineering Website*, n.d.)

trodden.

Such an intra and extra-curricular interplay is captured by Guattari's notion of diagrammatic thought. How else can signifiers from disparate semiotic registers such as, for instance, computational thinking, somatic experience, and critique of political economy conjugate and declinate each other?

Research Interstices

In 2015, I graduated with a masters in musicology but was eager to move on to a more expansive field combining theory and practice. I was interested to bring my experimental and improvisational electronic music and media arts practice into the research domain. Starting a PhD in MAS, I was immobilized by the open end of transdisciplinary study. What were the rules or relations that governed why or how one moved between disciplinary bounds? What permitted, authorized, or justifies selecting, borrowing, or appropriating an object of study if not disciplinarily preordained? When some idea or study did catch my interest, I might second guess myself: *you cannot get there from here*—an internalized disciplinarian subjectification. Of course, as anyone who is *in* on this way-finding joke knows: there is a way, but it is it not *the straightforward way*…

These questions lead us back to schizoanalysis, Guattari's life project implementing metamodelization[16] in a clinical setting. Schizoanalysis "tries to understand how it is that you got where you are" (Guattari in Watson, 2011, p. 8). Metamodelization

[16] See the introduction for a discussion of meta-modelization and schizoanalysis in the context of diagrammatics and producing subjectivity.

works by evaluating the model the patient has heretofore and, if necessary, works together to build new models that prove useful (Watson, 2011). Likewise, indisciplinary[17] research-creation is the construction of new models "to build a new subjectivity" (Watson, 2011). What is the glue holding these models together? Why is it not *easy* to go there from here?

Intellectual Crate Digging: Metamodeling, Cathexis, and Media Objects

In study, practices such as notetaking and diagramming help people to record and organize ideas, arguments, and references. Notes and diagrams then serve as important tools for making sense of the event in real-time as well as after the fact.[18] Diagrams and notes can also do important work in connecting learning from a certain event to other activities from the learner's life (other courses of study, stories and experiences, media objects, histories, etc.).

Consider a scene from the 2000 film *High Fidelity*. The protagonist Rob Gordon played by John Cusack is at a critical life/work/romantic crossroads. A friend/co-worker finds him in his apartment reorganizing his extensive vinyl record collection "autobiographically". Gordon tacitly admits something fundamental about our relationship to media and the artifacts that house them: we see the world around us constituted as objects already imbued with meaning made rich by our experiences of our

[17] Or "undisciplinary", as Guattari scholar Gary Genosko describes Guattari's work (1998).

[18] In future work, there will be more to be considered with respect to memory. There is the question of writing not just as an extension of embodied memory but of the process of writing as a haptic mode memory (pace Clark & Chalmers, 1998). There are as well the techniques of memory organization, which are detailed as precedents to Vannavar Bush's memex, a device will be discussed at some length below. In his text on Bush, Zachary discusses the 16th century Italian "memory theater" of Guilo Camillo and Francis Yates's "art of memory" (2018, p. 262).

world. At work is a phenomenon articulated through Freud's concept of *cathexis* – the emotional charging of objects (McIntosh, 1993). For Freud cathexis could be at work in a complex, but not necessarily.

Digital media objects are no different, although the ubiquity and ephemera of media streaming is transforming these relationships. Popular journalistic media decry "the woes of being addicted to streaming" (Larson, 2022), take stock of the strange recuperation of gatekeeper power resembling mass media in spite of individualized algorithmic recommendations (Petridis, 2022), and a sense of ennui emerging from music enthusiasts in response to the passive, non-intentional, and superficial modes of listening that the "disposable" abundance of streaming volunteers (Pelly, 2022). In short, for some a feeling untethered in a vast corpus of cultural media has muted the potential for aesthetic enjoyment. In addition to the ongoing return to legacy media technologies like vinyl records, cassette, iPods, and p2p music sharing which dissolve alienation from media objects, creative practices with media objects such as mix making, remixing, and musical arranging likewise may work antidotally on this aesthetic ennui.

Returning to the autobiographical practices described in *High Fidelity* gives us another example of an "everyday" creative practice of enjoying media objects through the production of subjectivity. Naturally he does not literally write an autobiographical book. A corpus of emotionally charged media objects allow Gordon to write his self and the relationships, experiences, that made him. His record collection becomes a diagram of how it is he got where he is, to hazard a mediatic response to the question phrased by the protagonist in the opening lines of the film: "Did I listen to pop music because I was

miserable? Or was I miserable because I listened to pop music?" (Frears, 2000). Neither, but instead is a third thing which resists universalization. The protagonist's diagrams are not only daydreams, nor are they mindless route movements or lifeless collages. They are a third thing that attaches onto the mind and the body, a practice of bridging, attaching, resonating mental and bodily modes of structuring experience.

How can we think beyond the mindstorm-bodystorm[19] duality? How could we better equip our modes and technologies of writing to express these relations through media expressivity and digital-physical objecthood? How can a diagrammatic approach unpack the tightly packed assumptions about what constitutes learning, writing, and creation? How can diagrammatics help us to take seriously the lateral connections and ecological thinking that motivated early computational media? To consider these questions experimentally, I turn next to an array of technologies that help us to flesh out what this approach might look like in a digital and physical system.

Towards Diagrammatic Systems

Post-Media Contexts

In the 1970s, French and Italian artists, activists, and psychoanalysts including Félix Guattari, Franco "Bifo" Berardi, Carlo Rovelli and Filippo Scòzzari took up creative practices with diverse media technologies as social, organizational, and artistic experiments, presaging what today is called tactical media (Apperich, 2013). We find flagship examples from this scene in the Italian Free Radio Movement of the 1970s and

[19] For a discussion of bodystorming in HCI and somatic research, see: (Cohn et al., 2012; Porfirio et al., 2019; Segura et al., 2016).

80s associated with the Autonomist political movements. Free Radio includes Radio Alice, a pirate radio station twice shut down by the government and radio Tomate in the 1980s (Collective A/Traverso, 1980; Goddard, 2013; Prince & Videcoq, 2005). According to a historical description,

> Radio Alice's broadcasts are an amalgam of music (rock, jazz, some classics, many folk and political protest songs), news (reports on left-wing and working-class struggles in Italy and abroad, reports on the local student movement, readings from newspapers published by groups of the "extra-parliamentary" left, up-to-the-minute accounts of activities organized by feminists, homosexuals, and radical civil-rights activists), and comments on a wide variety of topics by anyone who cares to telephone or drop in to the station's headquarters. These consist of two dilapidated rooms located on the top floor of an apartment building in a rather run-down residential section of Bologna. (Cowan quoted in Murphy & Daniel W., 2001)

Adjacent mediatic experiments support Goddard's statement that "Guattari was always less interested in new technologies per se than the collective assemblages of enunciation that they become the operators of" (2013, p. 45). So-called old media retained its relevancy, as seen in the activities of cartoonist, writer, and Radio Alice organizer Filippo Scòzzari, who participated in underground communities through satirical publications and other writings throughout his career. Guattari created two un-filmed screen plays, one about Radio Alice, and another called *A Love of UIQ*, a science fiction story about an alien life form living in a punk squat (Guattari, 2016a). On the other hand, the emergence and success of unique proto-web technologies such as Minitel[20] created an atmosphere of possibility for enacting such collectivities.

[20] For more on this device and network, see (Mailland & Driscoll, 2017). For Guattari's experimentations with it, see (Prince & Videcoq, 2005).

These experiments inspired Guattari's description of a nascent "post-media era", in which media would allow for the formation of subjective groups from the bottom up instead from top down (where broadcast mass media enacts a top-down subject formation). The promise of the post-media era was how telecommunications and computational media infrastructure could be leveraged to support the formation of new group subjectivities. These subjectivities, in their view, would be crucial for articulating and enacting the social and economic organization of more equitable futures.

Today, telecommunication is ubiquitous and social media affords the formations of all kinds of groups. In our contemporary research and innovation economy, the fields of HCI and MAS are uniquely positioned to leverage institutional capacity and digital technologies to create impact through policy and empower communities through platform creation. But have HCI and MAS failed to attend to the importance of how subjectivity is produced, when why and by whom it is produced?

In my view, the stakes are high. Social media has proven to be a crucial amplifier for overdue justice movements from #MeToo to Black Lives Matter. Meanwhile, the proliferation of extractive techniques, dark patterns, and attentive optimization negatively impacts many users' mental health, cybernetically perpetuating circuits of anxiety and depression. What is more, social media may even encourage divisive forms of dissent, weakening individuals' tolerance for collaboration and sabotaging the endurance political movements need to organize.

Diagrammatic Tendencies in HCI Furniture Computing and Media Art

This section surveys precedents in "furniture computers" from the field of HCI.

While my work draws on the culture and practice of HCI, my training and professionalization is not in HCI. For this reason, I include key examples and paradigms that help to contextualize what my project pulls from the concerns of historical and contemporary HCI. A more thorough literature review of relevant HCI is outside of the scope of this theoretical project precisely because *diagrammatic* answers to matters of political, ethical, and aesthetic concern from outside HCI. More will be articulated about this later in this section.

With that said, *diagrammatic* most closely aligns with what has been called "third-wave HCI", particularly as it brings us closer to a flat ontology characterized by an ecological paradigm (Resende et al., 2017). With political and economic power behind the "internet of things", which emphasizes a move away from personal computing and screen-based interaction, the possibility of technical and design practice's respect around such an ontology remains fragile.

Indeed, Susanne Bødker articulates an aspect of third-wave HCI's concern: decouple HCI's objectives from productivity and to consider a larger category of human activity (Bødker, 2006). By defocusing work, the useless, unproductive, and playful aspects of life are granted relevancy to technical systems. The hyper extraction of attentive micro labor through cultural activity (Adorno & Horkheimer, 1999) remains a central challenge beyond HCI, implicating any designer or artist interested in playful human activity with computers[21]. *Diagrammatic* social design aspires to attend to these

[21] See for example Miguel Sicart on games, play, and the culture industry: (Sicart, 2011).

issues of value, labor, and autonomy which are always at the periphery of cultural and computational activity yet never beyond the scope.[22]

Vannevar Bush, Research in Peacetime, and the New American Sciences. Long before anyone was speaking about human-computer interaction, Vannevar Bush designed a proto-computer: the memex. The memex emerged from Bush's overseeing the Office of Scientific Research and Development (OSRD) from its inception in 1941 until it was dissolved in 1947 (Zachary, 2018, pp. 261–265). The agency was tasked with overseeing and funding of research related to the wartime effort, including the Manhattan project. The month after the Soviets overtook Berlin and the Nazi's formal surrender (and the month before the United States dropped atomic bombs developed by the Manhattan project on Hiroshima and Nagasaki) Bush published two important documents, including "Science The Endless Frontier" (1945). Bush wrote "Science The Endless Frontier" in response to US president Roosevelt's asking how the United States could transition the scientific research done by OSRD to peacetime while growing their impact in on military but also industrial and medical activity. Although Bush's proposal was rejected by president Truman two years later, Bush's ideas shaped the proposal that enacted the National Science Foundation in 1950, creating the conditions for the particular political economy of knowledge production that lasts in some form today (Blanpied, 1998).

Locating Bush's foundational texts alongside the contemporaneous event of the horrific massacres of civilians, I do not intend to dismiss Bush or his vision of science

[22] This will be expounded upon later in the chapter.

and lateral thinking because of its connection to the horrors of unprecedented weapons of mass destructions. But the legacy of his impact on how science and technology develop in the 20th and 21st centuries cannot be separated from this history. Bush himself protested the testing of the hydrogen bomb and wished fission didn't exist (Zachary, 2018). But it does, and, the bombings are a part of Bush's legacy, alongside the weapons manufacturing company Raytheon he co-founded in the 1920s and which flourished during the second world war.[23] When president Eisenhower observed the growing military-industrial complex in the advent of The Cold War (Pursell Jr., 1969, pp. 461–462), Roosevelt's word "peacetime" and Bush's "endless frontier" take on new shades of meaning. This might remind that the organization of knowledge bends towards power. Knowledge organization technologies in turn bend towards the consolidation of that power. Instead of glossing over these legacies and political economic infrastructures, those close to that power might carry this political legacy into the contemporary situation with more intentionality and criticality.If the second text has a clearer relation to *diagrammatic,* it is because "As We May Think", a much more public document published in *The Atlantic* in July 1945, takes as its object lateral thinking, recollection, and knowledge occurrence (Bush, 1996). Although only hypothetically described in "As We May Think", the memex effectively outlined technical principles and interactions that would later become paradigmatic for computing's presence in our lives. Concatenating

[23] By the time of the second World War, Bush had stepped down from the company but still owned shares. He reasoned that the contracts between the OSRD and Raytheon were non-profit, although the wartime contracts seem to account for the companies 60-fold growth (Zachary, 2018, p. 137).

the words “memory” and “expansion”, the device reflects on the unique mental demands of Bush’s work during the war, which involved coordinating over 6000 scientists from different disciplines and collaborating with military and their wartime concerns. Thomas Lamarre refers to the memex as a “concrete machine” which helped to substantialize Bush’s concepts of “lateral connections” which presaged notions of ecological thinking / systems thinking[24] and Tim Berners-Lee’s invention of the world wide web and the hyperlink (Lamarre, 2021). Although Lamarre focuses on the Bush’s abstract machines to avoid reifying the memex, the memex’s tangibility creates certain corporeal affordances that enable an embodied meaning making. Tracking *diagrammatic’s* theoretical contributions, I follow Lamarre’s analysis at more length in the final portion of this chapter, which discusses *diagrammatic*’s theoretical contributions.

[24] See the popular book (Meadows, 2008)

DigitalDesk, Second Wave HCI and Tangible User Interfaces. Pierre Wellner's DigitalDesk is a clear antecedent to the *diagrammatic* user experience. DigitalDesk used a paired camera and projector to intermingle user experience objects from digital and physical realms. As a physical desk, the DigitalDesk collapsed the Alan Kay's "desktop metaphor" that reigned in interface design since the salad days of Xerox PARC. Characteristic of second wave HCI concerns that prioritized human actors over human factors (Bannon, 1995; Bødker, 2006; Harrison et al., 2007), Wellner's prototype takes Xerox PARC's instructive graphical user interface work to a physical environment people are already using.

The DigitalDesk includes a calculator function, whereby numbers can be entered into the calculator by writing them and then pointing to the written numerals and tapping a pen. Interactions of this type underline its objective as not to serve as a data-entry interface but rather to "support rapid and direction computer-based interaction" (Wellner, 1993, p. 90). Wellner's PaperPaint application allows artists to sample physical drawings, translate and repeat them elsewhere on the page—a technique that is still effective in digital drawing programs. Wellner also outlines the "Double DigitalDesk" which allows for network-mediated superimposition of presence between two remote desks.

The "return to the real world" underlines another important design tendency championed by PARC: "From the isolation of our workstations we try to interact with our surrounding environment, but the two worlds have little in common. How can we escape from the computer screen and bring these two worlds together?" (Wellner et al., 1993) Consideration of isolation brings psychological experience into account, while the plea to

"escape" the screen feels contemporaneous with descriptions of third wave HCI. Indeed, these aspects of Wellner's smart furniture piece make it a standout example from Xerox PARC. Hiroshi Ishi and Brygg Ulmer, who went on to found the Tangible Media Group at MIT, refer to DigitalDesk in the paper articulating their vision for the "tangible user interface" (1997).

Other aspects of the DigitalDesk project resonate strongly with second wave HCI. First, that the ubiquity of documents will allow for more collaborative working environments. Second, DigitalDesk imagines workplace futures. Wellner and the DigitalDesk seem to have predicted and pioneered some of the ways in which work and technology would evolve: "Consider your future office, which might be located at home… we can imagine an environment that automatically adjusts temperature, music and the information displayed on the whiteboard according to its occupants" (Wellner et al., 1993, p. 25). However, they did not imagine the political-economic implications or the psychological distress such "everyware" might create (Greenfield, 2010).

***Table of Contents* and Faciality.** In 2014 and 2015, Synthesis Center at Arizona State University in Tempe and the Topological Media Lab at Concordia University in Montreal collaborated on a telematic project called Table of Contents (TOC) (Montpellier et al., 2015). Real-time projection and camera sensing sutured two spaces by reproducing the overhead view on each respective table at the remote site. Using real-time audio sensing and playback to establish a channel of audio communication, the two tables were superimposed as if they were a single hybrid piece of furniture in two locations at once.

Our collaboration was interested in how ambient visual mediation (as opposed to facial, and 1-to-1 or 1 to many interaction in dominant video conferencing) would scaffold different modes of attending and coordinating in social situations. Through reading group and working sessions with the TOC, we came to understand the social potentials[25] of these techniques. As a mode of cultivating social intimacy across space, TOC tapped into the phenomenon of co-presence and superimposition of disparate objects that has been a driving aspect of the telematic art canon (Sermon, 1992). TOC also afforded durational inscription across locations, leaving notes and drawings from one reading session to the next. Challenges emerged including the navigation of turn-taking and critical issues regarding privacy and trust.

In the conclusion of his account of lecturing in educational contexts through Deleuze and Guattari's concept of faciality (1987, pp. 167–191), Tyson E. Lewis

[25] Although there are certainly implications for computer supported collaborative work as well. Indeed if the work would gone for further funding, it likely would have to have found potential use cases in categories such as the future of work or cyberlearning.

considers TOC as an example of how non-facially oriented technologies can destratify classroom environments, but cautions "there is no guarantee that it would not result in hyper facialization (of a table or object or gesture, for instance)" (Lewis, 2022, p. 18). Indeed, our future looking part of the paper we begin to speculate on potential gesture semiotics that could govern and replace the information introduced into the social system through the face. This critique of faciality presses right into the heart of the micropolitics of designing and using social computing systems. Resende et al characterize second and third wave HCI in terms of these micropolitical concerns in which meaning is "built on the fly, collaboratively, by people in specific contexts" (2017, p. 19)[26].

[26] Resende et al use Gayatri Spivak's critique of Deleuze and Guattari to motivate these context-dependent characterization of third wave HCI. It is beyond the scope of the argument to clarify the Spivak / Deleuze and Guattari conversation, but I should flag the tension for clarity.

In the article "Can the Subaltern Speak?" (1988) Gayatri Spivak targets Deleuze and Guattari as speaking on behalf of or in front of the subaltern: a person who, through lasting and colonial legacies is excluded from Western hierarchical societies.

Resende et al. writes of third wave HCI as working as if in response to this critique, at least in spirit, to allow people and groups to construct their own relationships by appropriating social computing infrastructures. Following Robinson and Tormey (2010), in my own view Deleuze and Guattari have much to offer liberatory postcolonial projects through concepts such as micropolitics, which finds instantiation in "perception, affection, conversation" (1987, p. 213).

In short, I find Resende's characterizations helpful, but do not agree with the exclusion of Deleuze and Guattari's languages of flow in their understanding of third wave HCI. On the contrary, I believe Deleuze and Guattari's work could be doing much more to bolster what already exists and expand the field's understanding of potential sites of autonomous subjectivity production. Lewis's article speaks to this, as could this chapter.

Paper computing: Know-How Computers, La Tabla, Dynamicland. Paper computers have their origin in computing education efforts of the 1980s. Westdeutscher Rundfunk (WDR) Computer Club developed the Know-how Computer to prime learners in computational thinking. According to the progenitors, the paper handout (*Ausgabe*) was shared over 400,000 times (WDR Computerclub, 2001). The motivation was both economical (the cost of personal computers was still relatively high and inaccessible to school districts) and pedagogical (a paper handout was a familiar environment compared to the command line). For our purposes, the Know-How Computer's contribution was its paper and pencil tangibility; thinking and indeed the desktop operation of writing can be understood as computation.

Computer history enthusiasts understand arithmetic and other mathematical operations have long been called computation and its human executors called computers. With the WDR paper computer, the objectification of non-silicon material points to broader possibilities for what might be considered computation. Matthew Kirschenbaum has also argued that tabletop boardgames can be seen as computers (quoted in Sayers, 2018), opening up the possibilities of computational environments beyond doing arithmetic and the office work for which it is known.

Paper computers fill out these possibilities in HCI work geared towards playful, social interactions. Inspired by open-ended affordances of playgrounds, Chaim Gingold started the La Tabla project with Luke Iannini (Gingold & Ianni, 2018). The programmer and scholar, who worked as a designer on open-world simulation game *Spore*, developed a computer-vision and projection environment similar in form factor to DigitalDesk. In

La Tabla, groups of people around a table can use cut or assembled sheets paper to construct playgrounds for projected blobs, create a projected pinball environment with movable flippers and bumpers anchored to material props, animate a scene, or program a musical sequencer.

The *La Tabla* project developed in parallel and inspired *Dynamicland*, which continued to extend the use cases of *La Tabla.* While *Diagrammatic* is not designed to work around paper, these projects use of paper supports *Diagrammatic*'s design focus on material and tangible computing environments. *Dynamicland*'s website make clear its aspirations as a social machine while also emphasizing its engagement with environmental factors ("the building is the computer") (Ianni & Victor, n.d.).

Reactable and Tangible User Interface OSC. Published in 2007 Reactable used its fiducial tracking and projection system to implement modular synthesis abstractions (Jordà et al., 2007). A syntactical corpus identifies different physical markers as generators and operators, which, in proximity with other modules, modify each other's function by establishing a signal path. This interaction schema leverages the tactile modes in which synthesizer musicians re-figure their instrument on the fly. Akin to turning a dial, the musician linearly or logo-rhythmically modifies that module's parameters by rotating a given markers.

Reactable has since developed tabletop units as commercial product for performing artists, hotels, and museums. More recently they developed a more accessible tablet/smartphone app that replicates the spatial interface and synthesis functions. Reactable community page allows musicians to share their "tables", their own

configurations of the synthesizer, as well as audio files of musical pieces they've created.

Reactable implements the TUIO, protocol an open-source library for table-top interaction created by the makers of Reactable in 2005 (Kaltenbrunner et al., 2005). Based on Open Sound Control (OSC) (Wright & Freed, 1997), TUIO standardizes communication of the identity, position, and rotation of their amoeba-like markers to a secondary application where that data is put to use. The application reacTIVision is also maintained by members of the Reactable team. This open-source software implements the computer vision algorithms for interpreting streaming table-top camera data. The application is equipped to send TUIO via UDP to a secondary application, so it may be repurposed in new prototypes and table-top experiments.

Mindstorms and Constructionism. Seymour Papert's applications in computer assisted collaborative learning are an instructive precedent for *diagrammatic'*s implementation and theoretical background. The monograph *Mindstorm* is a foundational text for a particular flavor of STEM and STEAM educational initiatives emphasizing hands-on and playful learning (Daugherty, 2013; Piro, 2010). Papert champions the computer as a potential venue for playful approaches to learning mathematics. Crucially, he advocates for students learning to program computers, rather than elevating the technology to ersatz instructor. His contributions have also been traced to the development of maker culture as well as the recent ingression of "making and doing" in science & technology studies (Lachney & Foster, 2020).

Papert's project is one of genetic epistemology in the constructivist tradition of Jean Piaget. Papert seeks to expand Piaget's concept of assimilation, in which new

knowledge is associated according to internalized models, with an "affective dimension" (1980, vii). Describing how mental models of automotive gear systems grounded his subsequent learning, Papert ascribes his latter success not only to the ease of having a mental model ready-at-hand, but also to his enjoyment of relating those systems—that it felt good to make connections.

Papert takes the programmable drawing robotic device the TURTLE as "objects to think with" (1980, 11, 23), a phrasing that presages the extended and embodied cognition movement of the 1990s and beyond (Clark & Chalmers, 1998; Varela et al., 2017) and has been taken up in critical making circles as well (O'Gorman, 2017). Relating the usefulness of his childhood fascination with the differential gear, Papert dismisses the notion that gear systems hold special status as "objects to think with," underlining the constructivist perspective he would later elaborate with Sherry Turkle as epistemological pluralism (1992). He does wager that the personal computer may hold this potential, a bet fleshed out in his research and development career through projects like the LOGO programming language.

Electronic Writing and Literature Authoring Systems, Traversal, and Interactivity as Self-Authoring. As embodied by the Electronic Literature Organization (ELO), electronic literature's rich history includes many examples of creative practices with authoring systems (Hayles, 2007). The advent of the hyperlink providing the initial catalyst for practitioners implementing literature non-linearly, displaying different frames of static text quickly grew into more adventurous media enterprises. Indeed, the construction and performance practices of the authoring system itself is a generative topic for practitioners and scholars in this area. Judy Malloy traces the origins of authoring systems to pre-Modern Europe (2021, p. 351), thinking through the non-linearity afforded by dice game pieces and adjacent chance operations. Malloy also connects the contemporary algorithmic practices found in electronic literature to early compositional, notational, and performative experimentations in polyphonic music (2014).

While practitioners in electronic literature develop their own authoring systems, Malloy includes in her definition "off-the-shelf" systems. Examples of the latter include STORYSPACE developed by the hypertext outlet Eastgate Publishers, Twine by Twinery, and even game engines like Unity or Unreal. Malloy created her own authoring systems for "nonsequential" narrative. In 1989 Malloy deployed a BASIC program called "Narrabase Press Edition" (Grigar 2011) which has undergone iterations over the years, the last an in-progress iPad version. Recounting a performative engagement with Malloy's work *its name was Penelope*, electronic literature scholar Dene Grigar writes about her "traversal" of the document. The occasion was hosted by the Electronic Literature Lab as part of a series of "Live Stream Traversals" of historical electronic

literature and art games from 2017-2018 documented in the multimedia book *Rebooting Electronic Literature* (Grigar et al 2018).

In their text *Traversals: The Use of Preservation for Early Electronic Writing,* Stuart Moulthrop and Dene Grigar motivate the performative event "traversals" as an important way of preserving these works of electronic literature and making historical works accessible to new audiences (Moulthrop & Grigar, 2017). Because these works are situated in a particular historical-technical context, readers' ability to run their software may diminish as it becomes unsupported by modern operating systems or hardware becomes inaccessible. Grigar and Moulthrop define a traversal as a *"*reflective encounter with a digital text in which the possibilities of that text are explored in a way that indicates its key features, capabilities, and themes" (2017, p. 7). While they speculate that the name traversals may point to the movement between nodes in a diagram in graph theory, many works of electronic literature and authoring systems exceed the bounds of discrete state machines prescribed by graph theoretical notation or inspirational texts such as Borges "Garden of Forking Paths" (Borges, 2007). Nevertheless, traversals suggest a *moving through*, a resonance echoed by Grigar's use of the term "pathfinding".

The evocation of topological graphs and traversals elides with the diagrammatic. Johanna Drucker investigates experimental printing, book culture, speculative computing, digital humanities, and has used the modifier "diagrammatic" in her own works, notably the experimental typographical text *Diagrammatic Writing* (2013). While the book is a printed codex and not a work of electronic literature, she uses spatial transformations of the text in order to "demonstrate that a book is not a static object but a dynamic space,

not a fixed and final expression but an organized arrangement of elements whose spatial relations encode semantic value" (Drucker, 2014). Drucker's work reminds us that the book is always already a space affording nonlinear traversal, whether on the scale of plateaus in Deleuze and Guattari's *A Thousand Plateaus*[27] or at the scale of a page, a line, or a few words.

Drucker's prologue (2013) captures her approach to diagrammatics:

> The semantic system of graphic relations
>
> The graphical expression of semantic relations (2013, p. i)

Throughout the text, she subverts the conventions of typography and visual communication (text hierarchy, spatial rhetoric) to order to interrogate them, to ask what it is that a text could do. As such, the book acts as a meta-model of reading itself.

She refers throughout to the windowing affordances of computational interfaces with which she is well acquainted. She writes:

> The features of motion and rate of temporal and spatial change animate the field of graphical expressions in a networked environment. The apparently dynamic space is an extension of the apparently static space, not a different order of

[27] See Brian Massumi's introduction to his translation of the text:: "How should *A Thousand Plateaus* be played? When you buy a record there are always cuts that leave you cold. You skip them. You do not approach a record as a closed book that you have to take or leave. Other cuts you may listen to over and over again. They follow you. You find yourself humming them under your breath as you go about your daily business. *A Thousand Plateaus* is conceived as an open system. It does not pretend to have the final word. The authors' hope, however, is that elements of it will stay with a certain number of its readers and will weave into the melody of their everyday lives" (Massumi, iii-iv).

"Most of all, the reader is invited to lift a dynamism out of the book entirely, and incarnate it in a foreign medium, whether it be painting or Politics…The best way of all to approach the book is to read it as a challenge: to pry open the vacant spaces that would enable you to build your life and those of the people around you into a plateau of intensity that would leave afterimages of its dynamism that could be reinjected into still other lives, creating a fabric of heightened states between which any number, the greatest number, of connecting routes would exist." (Massumi xv)

> graphical expression and not a distinct system, but one that takes the latencies of the apparently static and activates them according to "real time" illusion of perception or other rates of change. The basic functions/roles of graphical expression remain: presentation, representation, navigation, orientation, reference, association.
>
> The rhetorical force of diagrammatic expression can never be reduced to absolutes, stable entities, or autonomous effects. The relational system of diagrammatic writing is always emergent and conditional, its values relative, its production of effects inexhaustibly variable and specific. (29)

Whether a public event exploring an electronic work, or a printed book designed to encourage playful and creative reading, both emphasize the embedding of potentials into creative works in a way that resonates with interactive art making. Like interactive art, electronic literature and interactive art preserver the author/reader roles of traditional print media.

While we may speak of this work as diagrams or diagrammatic in reference to graph topology diagrams and visual communicative diagrams, they only begin to open onto the aspirations of Guattari's description diagrammatics. Diagrammatics 1) accumulates and concatenates models of experience without integrating them into a universal or dissipating the tension between their inconsistencies 2) generates a meta-model of subjectivity. Literature (electronic or otherwise) certainly affords possibility for diagrammatic encounters, but the effects of that encounter must be borne out in some other space: a conversation, an essay, an artwork, a therapy session. Drucker's piece diagrams the experience of reading, experiments in the graphical and spatial domain, and affords the reader a similar potential to creatively diagram their intensive reading. The reader can fill the margins with notes, create their own branching text structures, and in a PDF even add comments with links to other media hosted online.

The *diagrammatic* system proposed and implemented in this chapter aims for a social dynamic not found in electronic literature or Drucker's monograph. While permissions make a distinction between read/write abilities in a web-hosted word processing document for example, the distinction between writer and reader is more fluid.

Diagrammatic: A Prototype Towards Diagrammatic Media

> The distinction between the World and View is crucial. The World is what the user is supposed to be acting on and thinking about: the View is all he really gets […] The designer should begin by thinking about visualizing the *World,* not the Views, and let the Views come later. (Yet designers are always getting seduced by particular views and treating them as the world itself.)[28] (T. Nelson, 1980, p. 102)

Overview

The call for a post-media era of heterogenetic technical systems motivates an intentionally diagrammatic approach to creative computational media. In the previous section, we have seen a history of media systems which might be characterized as diagrammatic, although none convene around the clinical/para-clinical and activist philosophical activity that Guattari would describe as diagrammatics. For Guattari, diagrammatics is the practice of creating improvised models of the world and, in turn, mapping subjectivity.[29]

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[28] I am grateful to Stephan Farrugia who tweeted an image of this quote in unabridged form which made me aware of this text.

[29] Guattari is quite fond of cartographic language as a new edited collection in human geography evidences (Jellis et al., 2019). Guattari's own text, *Schizoanalytic Cartographies* (2013a) employs such language at length to discuss machinic evolution, aesthetics and ethics, theatre, semiotics, and subjectivity. Activist and artists Brian Holmes explicates the cartographic thought that wraps Guattari's work in his text "Guattari's Schizoanalytic Cartographies: Or Pathic Core at the Heart of Cybernetics" (2009). In Holmes' work, a homology between modeling and mapping becomes clear, pointing us to the fricative dynamic between the model-phenomenon and map-territory: "On the one hand, his fourfold meta-model invites us to examine the materials, affects, discourses and processes with which we construct our realities, so as to better

Concatenating and conjugating diagrammatics and media, this research asks: how can we use technologies to create maps and diagrams of our contemporary subjectivity? What new collaborative modes of writing does this enable? How can anxious bodies use these practices to reconfigure their relationship to the social, and, by extension, to the future? How can new models of collective subjectivity generate more equitable institutional practices? These questions posed expressly around the political problematic of subjectivity differentiates my work from the examples discussed in the previous section. In the following section, I map the world of *diagrammatic* as it has been instantiated to this point.

Diagrammatic "Augmented Reality"

In pursuit of these questions experimentally, experimentally, and empirically, I created a prototypical media system called *diagrammatic*. It may be referred to as extended, augmented, or mixed reality, in that it superimposes digital objects amongst the extensive environment (extension here refers to the physical quality of taking up space). At the time of writing, Silicon Valley has thoroughly saturated these terms with hype.[30]

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understand the maps that guide us through existence and to achieve greater degrees of self-modeling, along with deeper potentials for collective speech. But at the same time, his insistence on an ontological experience of the territory, modulated by the rhythmic presence-absence of aesthetic constellations, introduced a pathic core of uncertainty into any possible model, calling for intimate sensitivity to an otherness that could never be calculated or integrated to a semiotic system."

[30] While these labels may prove to be helpful handholds for people looking to get a grasp on the work, I do not think the work resonates with these categories. It may be that, to borrow from the Ted Nelson quote which begins this section, that so much work in AR is fixated on views and that little of it deals significantly with worlds. There is certainly more criticism to be done here, although that is outside of the scope of this document.

The work's open-source ethos aspires to stand apart from commercialized modes of distribution, whereby apps are developed for proprietary hardware platforms. Apart from speaking a different design language, if

What is more, many contemporary AR applications involve screen displays, whether through the phone or a headset, skewing heavily towards an ocularcentrism. *Diagrammatic*'s projection of 2D objects may feel vintaged juxtaposed with 3D meshes floating in space. Using webcam-enabled fiducial marker tracking[31] a notecard is computationally anchored to these images. Atop a table or a wall, projected media objects such as video, sound clips, images, and text intermingle with physical objects. In the "experimentations" section, I share table-top, wall-project, and related configurations.

MediaObjects and MediaBundles

A central user-experience conceit of *diagrammatic* is the MediaObject, an agnostic container for text, video, BiBtex files, images, and sound files. A second related conceit is the MediaBundle, which is a name associated with one or more MediaObjects. A MediaBundle can be associated with a heterogenous array of MediaObjects.

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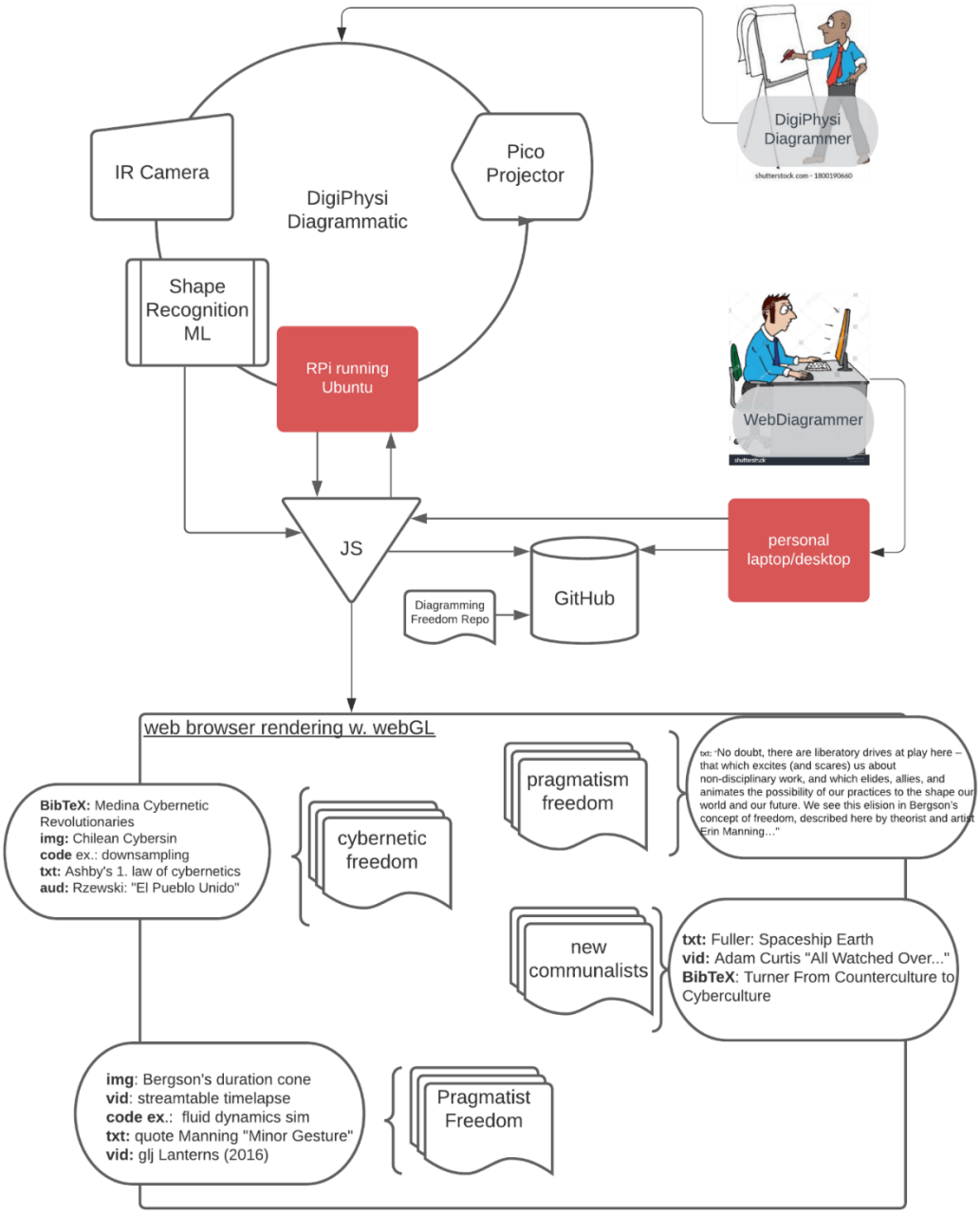
the project does some day take on some centralized cohesive product design, it may feel more like an odd DIY video game console, inviting contents such as Ian Bogost's set of four video "game poems" *A Slow Year* (2010). I will refrain from elaborating on this at length as such future instantiations are outside of the world sketching purpose of this chapter.

[31] This version is currently using the TUIO ReacTIVision library described in the first section (Kaltenbrunner et al., 2005). Future implementations could leverage machine learning to recognize physical objects or drawings.

Figure 1: *Diagrammatic* workflow and user experience diagram.



A person associates a fiducial marker with a media bundle, allowing them to reassemble media objects in space on the fly. Looking to enable new forms of writing

which take seriously how we invest emotionally into media objects and use them to make meaning, diagrammatic also allows for "bundling" of media objects, re-enacting lateral connections consistent with Vannevar Bush's notions of ecological thinking.[32]

Animating Diagrams

A collection of MediaBundles is a Diagram. The projection surface (wall, table, etc.) and fiducial marker cards function as a gestural interface. Consider a different the software program CataRT developed at the electronic sound and media arts research center IRCAM over the last fifteen years (Schwarz et al., 2008). Musicians can use this software to algorithmically digest pre-recorded or live sound files and distribute them into feature spaces. The sound chunks are plotted on an XY grid according to algorithmically determined sonic features. The musician navigates and traverses this 2D gesture space, concatenating sonic chunks into novel sequences.

Likewise, a wall of post-its and their sutured media bundles form a gesture space determined not algorithmically but according to whatever meaning-making schema the student or teacher finds suitable or wants to try out. Instead of navigating through a sonic feature space, diagrammers treat the wall or table of cards and media objects as a site for navigating content and expression non-linearly. As a result, one may use the MediaBundles diagrams they create for a variety of purposes: as a presentation medium for a student to explicate an aspect of coursework to their peers; preparing a paper or informal response; brainstorming a project; telling a story or making a book.

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[32] The concept of a bundle recalls how multiple data signal streams can be bundled in OSC protocol in the Odot programming framework (Freed & MacCallum, 2007).

Design Desiderata and Ethos

This section continues more explicitly the sketching of the *diagrammatic* world. As I have previously mentioned, it draws on systems designed for organizing thought like Bush's Memex. Nelson's writings and visionary work on the Xanadu system is inspirational here as well (1975). Pragmatic concerns such as funding and time dictate a tempering to lightweight implementation to test the concept. I include these qualifications as we go. As a design consideration, it is important to both detach from norms on interactivity as well as to make a system with a shallow enough learning curve amenable to interested parties.

As such, I work to refrain as much as possible from speculative design choices. For instance, one question that emerges is how people create and introduce MediaBundles into the system. One might appeal to naturalistic, anthropocentric interaction schemas and implement a system where people could speak media bundles into existence. Even with the significant advances in speech recognition technology, adding an input workflow in an unfamiliar interaction syntax layers a cognitive load onto potential authors. When the novelty of the system is its tangible interaction (which has its own novel interaction elements people must develop skills with), the cognitive load introduced by using a technology such as speech recognition might be unnecessary. What's more, using a standardized keyboard and mouse actually leverages skillsets that are already widely distributed: contra west-coast synthesizer pioneer Don Buchla, east-coast synthesizer pioneer Robert Moog insisted on including a traditional 12-tone black/white pianistic keyboard with many of his instruments because they allowed

musicians to bootstrap muscle memories and musicalities (see Pinch & Trocco, 2004). In a similar spirit, below I describe the worldbuilding practices and intentions.

Mindful of the problematic effects of screentime, *Diagrammatic* minimizes screentime by utilizing a physical gestural control interface and projection instead of keyboard, mouse, and LCD screen. MediaBundles are created using point and click mouse and keyboard, which might be done on a screen or while looking at the projection environment. After the creation of a media bundle, one can work exclusively with fiducial markers to reorient the system.

If the blogosphere that animated para-academic continental philosophy (speculative realism) in the 2010s was full accelerationist speed (Dean, 2010), while the production and circulation of scholarly books proceeds at a snail's pace, *Diagrammatic* aspires towards a "Goldilocks" collaborative speed. *Diagrammatic* is collaborative, but asynchronous first**.** We become familiar with collaboration in terms of 60-minute appointment chunks of video conferencing during the pandemic. Browser based word-processors with real-time synchronous editing encourages many exciting modes of collaboration (Ishtaiwa & Aburezeq, 2015), but especially with large groups these can tend towards swarming collaborative collages rather than thoughtful reciprocating engagement. Informed by deep work (see Newport, 2016), slow scholarship (see Nocek, 2017; Stengers, 2018), and open-source ethos, *Diagrammatic* has discrete read and write operations that must be initiated by the user. A more elegant solution that preserves this intentionality, takes care of possible overwriting situations, and expands the sociality of interactions is proposed in the wuture work section.

Modern personal computing experiences are largely built on the same concepts of connectivity introduced in Engelbart's Mother of All Demos. This includes our ability to "jump on a link"; the hyperlink was the suture that strung electronic documents together into what we now know as the world wide web. This nonlinear structure was given the name "hypertext" by Ted Nelson in 1962, and its nonlinear nature has led many scholars of new media to describe hypertext as a rhizome in the spirit of Deleuze and Guattari. But as the philosophers say themselves, a rhizome "must be made" (1987, p. 6). Modern web technologies, which concretize lateral connections into hashtags, have eschewed the radicality of the rhizome. *Diagrammatic* leverages the abstract machine of the hyperlink (or following Bush, the lateral connection), spatializing nodes in a novel way.

The Book is Dead, Long Live the Book; Long Live the Multiple, the Multiple Must be Made. In both the collaborative and individual works of Deleuze and Guattari one finds observations of the inadequacy of the book to novel modes of meaning making. In the introduction to *A Thousand Plateaus*, they write that the book re-enacts and reinforces the binary logics that scaffold much of modern thought: "The world has become chaos, but the book remains the image of the world: radicle-chaosmos rather than root-cosmos" (Deleuze & Guattari, 1987, p. 6). Deleuze prophesied a time when book-writing will be regarded as "the old style" of doing philosophy:

> The time is coming when it will hardly be possible to write a book of philosophy as it has been done for so long: 'Ah! the old style .. .'. The search for new means of philosophical expression was begun by Nietzsche and must be pursued today in relation to the renewal of certain other arts, such as the theatre or the cinema. In this context, we can now raise the question of the utilization of the history of philosophy. (Deleuze, 1994, p. xxi)

As is no doubt clear from the previous section on electronic literature, there are communities working at the fringes of the codex, de-coding its flows, making working with movements not only of the body, not only of the mind, but also a third thing. In the future work section, I describe plans to develop this into an authoring system, to use the term from electronic literature, by sponsoring collaborative compositions.[33] These commissions push the edges of the technical system, but also begin to experiment with the kinds of organizations that form around collaborative writing and reading.

Technical Implementation

Diagrammatic combines several contemporary applications of computing. I turn now to the technical makeup of the system in its current state at the time of publication. I assess some of the limitations of the current technical ensemble.

[33] See also the Institute for the Future of the Book, which have published works online from well-known authors in an innovative format.

JavaScript Schema. *Diagrammatic*'s central code is a web application written using Javascript (especially the library p5*js, which ports Processing to the web[34]), HTML, CSS.[35] This program revolves around managing the media bundle and media object so it can serve as both an object of experience and a software object. A diagrammer would begin by creating a MediaBundle which they populate with MediaObjects. The MediaBundle is a JS object that holds parameters about related to displaying the MediaBundle[36]. It also defines methods that are called to render its child MediaObjects to the canvas. In future work, more expressive animation techniques would be embedded as methods here.

When a person adds a piece of media, a JS object is created outlined by the class template MediaObject[37]. In the case of videos or images, the MediaObject records file data, as well as information pertinent to rendering the media. In the case of a text object, the object records text as a string. Inside the MediaObject are also hooks to the media server, described in the Backend section.

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[34] See https://p5js.org/. p5*js is a JavaScript library for creative coding that primarily acts upon an HTML5 Canvas element, also extended functionality also allows for doing things that JavaScript typically does for webpages, including modifying, creating, and deleting DOM elements. P5 (as it is known colloquially) has enjoyed popularity in recent years thanks to a large user community.

[35] The codebase is maintained here: https://github.com/garrett-laroy-johnson/diagrammatic

[36] See https://github.com/garrett-laroy-johnson/diagrammatic/blob/main/public/js/mediabundle.js

[37] See https://github.com/garrett-laroy-johnson/diagrammatic/blob/main/public/js/mediaobject.js

Graphical User Interface. Each MediaBundle and MediaObject can be parameterized by a hidable control panel generated using the QuickSettings JavaScript library. At the level of MediaObject, one can change: image scale, playback range, text size, font color, font style, displacement and other display settings.

Fiducial Marker Tracking and Projection. In its current iteration, *Diagrammatic* uses the reacTIVision framework for fiducial marker tracking. ReacTIVision, which generates its own coordinates, is especially convenient since it contains an easily parameterizable tool for deforming the projection area from the incoming camera image to a Cartesian plane, ensuring a fairly tight projection mapping between fiducials and projection. The TUIO format facilitates exchanges of fiducial coordinates with the Node application. Despite these benefits, the ReacTIVision application is unintuitive for non-expert users to use and setup.

Backend. The client-side applications interfaces with a server via node.js. Each MediaObject contains a unique tag that corresponds to a piece of media as well as a copy of the MediaObject's JSON parameters stored in a database on a remote server.[38] Likewise, each MediaBundle references those tags to display media objects.

Situational Experimentation

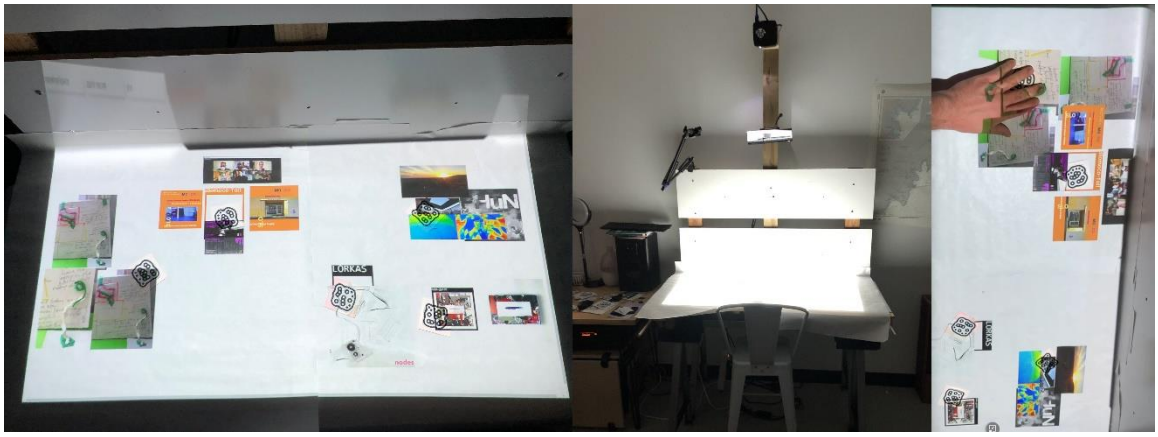
Here I share documentation of diagrammatic in different spatial and situational configurations.

[38] The remote server was built by Chicago-based media artist and programmer Amay Kataria.

Tabletop Diagrams. The tabletop configuration is an intuitive one for this system. Fiducial markers sit easily on the surface and may be moved around freely. As well, one may situate a wireless keyboard on the desk so to easily load in and parameterize MediaObjects and MediaBundles.

An advantage of this configuration is the ease with which one may adjunct the configuration of the diagram, but a disadvantage is the physical infrastructure needed to attach a camera / projector pair. In most circumstances must be constructed explicitly for this purpose. If this mounting equipment is attached to the table itself, it also limits the table's use in other situations.[39]

Figure 2: *Diagrammatic* table configuration.



[39] For video documentation of tabletop mode, see https://www.youtube.com/watch?v=tc_e_N3GFOY.

Writing on the Wall. Fiducial markers can be affixed to the wall with adhesive in an analogous manner to adhesive notes, leveraging those physical habits. An advantage of this configuration is the robust set of viewing angles afforded by a wall. While a table requires one to look down upon it, evoking a God's eye view, projection on a wall often can be seen from many positions in that room. The size of a diagram is not limited to the size of a table. From a hardware standpoint, a tripod outfitted to mount a projector and camera requires upfront work and configuration but is a portable solution.

Diagrammatic Scrolls. I developed a third and less obvious physical instantiation: a scrolling apparatus. This design begins to think through an analog solution to continuous state space management. The challenge for *diagrammatic* is to consider how to manage material larger than a single material surface. One could compose bundles ahead of time and physically place and remove them accordingly, but this could be tedious for some.

Let us consider solutions from analogous mediums. Slide presentations transition between discrete materials. Prezi is notable in its presentation of spatial domain which windowing software traverses continuously, a feature contemporary whiteboard software builds upon.[40] These platforms are primarily digital however. The press of a button or scroll of a mouse enacts movement through digital space. *Diagrammatic* creates the possibilities for a more tangible relationship between content, movement and the body. While *diagrammatic* could use gesture tracking through hardware such as LeapMotion,

[40] See https://prezi.com/ and Miro https://miro.com/login/.

this increases the platforms cost and introduces potentially cumbersome learning curve of a non-tangible interface.

Using a roll of drawing paper, I created a physical loop into which I embedded MediaBundles by taping fiducials to the page. With a crude crank mechanism, the loop can be progressed and the diagram animated. Such a scroll can be placed on a table, or also on a wall.

Future Work

Future iterations of this work could be embellished by both additional technical features and integrations as well as socially embedded initiatives.

Instead of emphasizing the real-time synchronous collaboration which has become omnipresent during the pandemic, diagrammatic draws on the self-help concept of deep work and governance structures from open-source software (OSS). To more deeply pursue a collaborative model influenced by OSS, *diagrammatic*'s social functionality could be built on top of GitHub. Thus, the collaborative authorship structure would leverage an effective tool that assumes little about where, who, and when collaborators are while affording contributors authorship and decision-making agency.[41]

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[41] *Diagrammatic* must confront not only technical challenges of usability and user experience, but also, if it is to be taken up in scholarly writing, serious institutional ones. In our present moment, the driving scholarly mechanism of peer-review is in crisis as academics become more protective of their time and aware of exploitative practices within the academe. How then, should we expect scholars to be available to remix each other's experimental works if they have no prestige or institutional influence?

There are at least three strategies and any number of mixtures. First is to adapt: create DOIs for each publication. Recruit a board of prestigious board of editors and brand as a scholarly journal.

Second is to reform academic structures. Make a rigorous argument for "version control" (read git protocol) as a form of peer-review. Incentivize participation through a tokenized means such as grant

With a more robust social infrastructure in place, *diagrammatic* could be used in intellectual and artistic communities at a larger scale. Experimentation in digital-first publication platforms at independent and academic publishers alike signals a hunger for more accessible and expressive venues for writing.[42] To move in this direction, I would commission a cohort of 5-10 authors and artists to produce iterations of their own original work with *diagrammatic*. During the iterative process, authors would be asked to borrow, branch off, or add toother authors' diagrams. This will produce a collection of diagrammatic publications which will have their own life in the digital humanities and arts, animated by roundtables and exhibitions of the *diagrammatic* systems at professional conferences. Interviews throughout the process about how the platform enabled or constrained thought or collaboration would produce publications in traditional academic publications.

Diagrammatic offers possibilities for exploring the intersection between constructivist approaches to learning and emerging technologies. I would engage students as collaborators in creative research. I envision teaching a topics course on emerging technologies and subjectivity as part of a media arts curriculum using *diagrammatic* as a

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money. Or, develop a microtransactional system not only for money (see GitCoin https://gitcoin.co/) but also scholarly capital.

Third is to divest from academic publication standards altogether. This comes at a cost but with distinct benefits. Para-academic publication increases accessibility to a diversity of voices, but participation is highly disincentivized for potential academic contributors. In any event, fields such as art practice, the digital humanities, science and technology studies, creative publication is developing its own economy of scholarly capital.

[42] See examples in scholarly publishing stemming from digital humanities initiatives such as Manifold App (www.manifold.app) and Knowledge Future's Group PubPub (https://www.pubpub.org/). For perspectives on the affordances and limitations of alternative publishing models see (Dean, 2010; Thoburn, 2016).

substitute LMS. Those interested students in the research aspect will be invited to enroll in an independent study the following semester where we will analyze our data and produce a collaborative diagram.

Finally, I envision diagrammatic being re-tooled as a tangible user interface infrastructure for related works of diagrammatic media. 📜*DOOMSCROLLS*📜 is the working title of a post-dissertation project in the planning stages designed for a gallery environment. I am interested in augmenting the scrolling infrastructure mentioned above with 360-degree motors to create continuously looping scrolls of paper that could be mounted on a wall or a table. The scroll would be outfitted with a projector and camera and the diagrammatic infrastructure would be used to project MediaBundles composed by gallery visitors. Following works like Ben Grosser's *Endless Doomscroller* (2021), the installation leans into the positive feedback loop of compulsive social media scrolling, anxiety, dread, and helplessness. It strives to create an aesthetic atmosphere like goth music or horror film, in which the darker aspects of life can be thematized, inspected, and even enjoyed.[43] By some prompt, visitors will be invited to add some doom to the scrolls as a MediaBundle, whether through a term that generates an image, or some text. The scrolls will run continuously.

It flips "information" in the Shannonian sense (1948), in which the meaning of the messages between sender and receiver is "irrelevant" to the representation, to a Simondian one, in which information acts within the complex of technical ensemble and

[43] For a reading of biology against the holism of German Idealism and through goth aesthetic, see (Thurtle, 2020).

milieu to push the process of individuation forward (2020). This creates an environment where people can literally project (and figuratively in the Freudian sense) their conception of doom before a shifting public. Thus, the gallery becomes a slow, undulating shock to thought for a possible collective psychoanalysis to come, not a mindstorm, or a bodystorm, but a third thing.

The BwOdystorm, Animating of the Self at its Edges

I conclude this chapter with theoretical reflections on diagrammatic, its implications, and possibilities for writing, learning, and the production of subjectivity. We return first to Vannevar Bush as read by Thomas Lamarre to understand the memex system as both a piece of furniture and as a conceptual apparatus for corporeal, gestural animation. By animation I mean an embodied and technical writing of the self. We then turn to Papert's term "mindstorm" and his fascination with gear systems as the basis for his epistemological constructionism. Finally we introduce a long awaited third thing, which does not preclude self-animation or mindstorm, but rather sits on the side of it, decodes it diagrammatically: the Deleuzoguattarian Body without Organs (or BwO) (1987, pp. 4, 150–166).

Memex, Self-Animation, Confessionals and Couches

As discussed in the paper's first section, in a recent article called "Animation and Information", Thomas Lamarre takes up proto-computer engineer and co-founder of the NSF Vannevar Bush's 1945 essay "As We May Think" and Bush's *memex* device to describe "an ecology of pathfinding" (Bush, 1996; Lamarre, 2021). To rehearse again the context and begin to elaborate Lamarre's analysis: As a research scientist organizing and

coordinated university research with US military efforts, Bush observed how the shared cause of the war temporarily de-escalated competition between scientists. An overabundance of knowledge enclosed by disciplinary apparatus (information overload) motivated the coordination of knowledge across enclosures.

For Lamarre, this concept of information overload pinpoints a new conceptual of knowledge contrary to the Kantian transcendental schema in which all may be known from a God's eye perspective. This transcendental schema is concretized by the table, or the grid (which he notes are not erased entirely by Bush's contributions but persist in the former of databases, matrices, tables) (2021, pp. 2–3).

Bush's essay transforms observations about information management during the war effort into a more permanent elaboration of this knowledge organization practice, which would need to continue specialization or disciplinarity (characterized by vertical depth) while enabling, facilitating, and the coordination between disciplines (characterized as "lateral connections"). As previously mentioned, he proposes the *memex,* a protocomputer device that proceeds the mechanics of the hyperlink. Indeed, the wartime scientists already found themselves in something of a network, though Lamarre points out the abundance of biological and organicist language in receptions of Bush's work (2021, p. 6). With the *memex* devices, researchers would be able to quickly "search, record, analyze, and communicate information" which were linked together by lateral connections (2021, p. 2). Lamarre's question is about "how acts of animation and processes of information have been coupled to construct a form of knowledge" (2021, p. 1).

Animation here means the embodied interactions with technical devices commonly dealt with today in the field of HCI. The *memex* figures as a furniture object lesson replacing the table lending itself to associative thinking. As a hardware device (concrete machine) that instantiates and enacts these organizations and processes (abstract machine), the *memex* "yokes doing and thinking" (2021, p. 5). This yoke participates in the enactment of an ecology of thought. Lamarre describes the movement between various depths of thought catalyzed by the moving body and the *memex* hardware as animation. "Associations do not precede their enactment" (2021, p. 5); at the nexus of corporeal enactment of associations, knowing constellated by lateral connections and vertical depth, and movement within a trail system of thought is an event Lamarre calls "self-animation" (2021, p. 7).

After aligning lateral connections with the body, he introduces a furniture object lesson from Foucault: the confessional: "The confessional enjoins you to invent a deep, dark truth to speak and to structure your self-knowledge around it." The *memex* inherits from the confessional as far as it allows for an invention of a self: "You are not just finding *a* way; you are finding *your* way. Yet this way that is yours does not well up within you. While you have a feeling of looking for something that is out there, it does not exist ready-made" (2021, p. 8). The enacting of these lateral connections not through but with the body, the material, and the semiotic structure of the *memex* are animate the self, they are a "self-animation."

Self-animation and lateral connections are analogous to schizoanalytic-metamodeling and diagrammatic media, respectfully. The reader may have already

recalled my earlier citation of O'Sullivan's characterization of diagrammatics as process of moving concepts around "as if on a table" (O'Sullivan, 2015, p. 21). Lamarre's characterization of the *memex* as a wayfinding ecology recalls my observations from the introduction, as well as Guattari's cartographic figures of thought. O'Sullivan's characterization clearly resonates with the *diagrammatic* system. How do these concepts help us to think through what *diagrammatic* does, or aspires to do?

Following Foucault, Lamarre's questions around knowledge are constellated by power and sovereignty. In the diagram of the confessional, the priest's presence enables the invention of the self through the admission and sometimes invention of sin. For Lamarre, the space for invention was in that what priest *could not see*.

Let us consider context, the social dyad of the psychoanalyst and the patient situated around the class furniture of the couch. In the typical psychoanalytic setting, the sovereignty of the analyst was exercised via transference. Like the priest, it is both the presence of the analysand and the absence of their speech that enabled the speaker (the confessing congregant or the analysand) to fabulate a self. The priest does not see into the private depths of the confessor, and the analyst cannot see into the analysand.[44]

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[44] Notwithstanding is the characterization of psychoanalysis as a priesthood of seers by Deleuze and Guattari. This acerbic characterization of psychoanalysts bolstering their status to priests features prominently in Deleuze and Guattari. Interestingly, part of Deleuze and Guattari's character building of the psychoanalyst priest involves sight:

"The interpretive priest, the seer, is one of the despot-god's bureaucrats. A new aspect of deception arises, the deception of the priest: interpretation is carried to infinity and never encounters anything to interpret that is not already itself an interpretation. […] The discovery of the psychoanalyst-priests (a discovery every kind of priest or seer made in their time) was that interpretation had to be subordinated to signifiance, to the point that the signifier would impart no signified without the signified reimparting signifier in its turn" (1987, p. 114; quoted in Michon, 2021).

For our purposes, the function of sight is instructive. In Freud's account of the *Verneinigung* interpretation, sometimes translated as denegation or denial, we see in miniature a difference how sight (or lack thereof) mediates differently between the silent priest and the congregant, and the analyst and analysand. Although they are not phenomenon that are mutually exclusive, these dynamics create divergent potentials for self-animation.

The Freudian analyst cannot access the inner experience of the analysand. This outlines the limits of psychoanalysis. Take the special case of *Verneinigung* described by Freud. In Freud's anecdotal lesson, the analysand relates to the analyst a figure in a dream who they say cannot be their mother. For Freud, the mother's rise to the surface of the patient's attention and mention is a meaningful data point, but the analyst's negation of her as signifier and signified suggests a repression borne out in the speech act. At this point, the figure in the dream, or whether there even was a dream, is less important than a mechanism of the unconscious has been spotted. The analyst may then retort: *Yes* (in German, *doch*, a reversal of a negation*), that is your mother*.

This creates (at least) three responses. First, the analysand might be unconvinced of a perfect symbolic equivalence between the mother and the figure in the dream, but the patient observes and concedes the analyst's point. The interpretation continues borne of this compromise: the analyst has shared an insight, but they, of course, do not have true

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Lamarre's silent priest and the "psychoanalyst priest", who indeed produces interpretations, have different relations to power via their relationship to the signifier and signified, a diagram that might be born out in a future project.

sight into the mind of the analysand. Secondly, the analysand may double down and refuse the interpretation. For Freud, this ceases the possibility of continuing the analysis. This demonstrates on one hand the risk of interpretation and on the other the limits of psychoanalysis. In a third case also representing the risk and most instructive for us, it is possible for the analysand to mistakenly believe the analyst can see into their interiority.[45]

This glitch dynamics of self-animation described in the third case point us to how I understand how the conditions for diagrammatics could be enacted by a system such as *diagrammatic*. Consider the moment of this glitch described above as an *information overload* in Simondian sense presented by Lamarre. The information introduced by the idea of someone seeing into the psyche threatens to throw open the portal between self (organized) and the world (chaotic). In such a moment, frightening and dangerous as it is, fixated on the portal, one might also glimpse an alien outside and beckon towards it. By inviting another process of alien information, the model of the starts up self again, it promises a nascent subjectivity sufficient to continue on. To allow the alien outside in and keep it alive, one must surpass the limits of the logics of interiority; one must, if even for a moment, make oneself a body without organs (BwO).[46]

Mindstorm → Bodystorm → BwOdystorming Diagrammatic Futures

In his book *Mindstorms*, Papert relates an anecdotal grounding for his constructionist pedagogical theories. As a child he was fascinated with automobiles and

[45] For more on Freud's concept of (de)negation enriched and re-examined through clinical insights, see (Madeira et al., 2016).

[46] The third chapter on anxiety deals with an extended example of such an alien self-animation.

differential gear systems. He found these mental models of these gear systems helped him think through algebra and geometry. He described the process of relating new phenomenon to these models as assimilation, a process he acknowledges does not always leave clean edges:

> "[…] there are often roadblocks in the process. New knowledge often contradicts the old, and effective learning requires strategies to deal with such conflict. Sometimes the conflicting pieces of knowledge can be reconciled, sometimes one or the other must be abandoned, and sometimes the two can both be "kept around" if safely maintained in separate mental compartments." (Papert, 1980, p. 121)

Although Papert does not write explicitly about the book's title Mindstorms, we might surmise that a mindstorm describes this assimilative movement of thought between models, and also a sorting of knowledge from models into distinct categories. In our current parlance, the more palatable term "brainstorm" captures the creative and constructive meaning making and abductive juxtapositions. Although already present in Papert's idea of the "mindstorm", the term and practice of "bodystorming" centers the body and decenters speech-bound ideations in order to bring experience, role play, and materiality more meaningfully into creative activity.

If, however, we sustain the tension between incompatible logics, if we take a risk of decompartmentalizing separate mental categories, if we allow them to decode at their edges and recode illegally, we have not a mindstorm, nor a bodystorm, but a third thing: a diagrammatic BwOdystorm. This term turns Deleuze and Guattari's concept of the body without organs (BwO) into an action. The body without organs generates deterritorializations and actuates abstract machines of thought into motion. The BwO resists assimilation (integration) by hacking open Papert's mental categories (below: strata) and constellates their contents according to a diagrammatic logic (on a plane of

consistency):

> The principal strata binding human beings are the organism, significance and interpretation, and subjectification and subjection. These strata together are what separates us from the plane of consistency and the abstract machine, where there is no longer any regime of signs, where the line of flight effectuates its own potential positivity and deterritorialization its absolute power. The problem, from this standpoint, is to tip the most favorable assemblage from its side facing the strata to its side facing the plane of consistency or the body without organs. Subjectification carries desire to such a point of excess and unloosening that it must either annihilate itself in a black hole or change planes. Destratify, open up to a new function, a diagrammatic function. (1987, p. 134)

The BwOdystorm bursts onto the scene precisely at the moment before an information overload. Deleuze and Guattari might understand information overload as a problem of bivalence: the BwOdystorm either averts the stultifying information overload by changing planes and opening onto a self-animating "positivity", or is engulfed by a black hole[47]. A BwOdystorm scours the virtual and actual alike for diagrammatic media objects—portals to abstract machines. The BwOdystorm assembles referents that seem disparate or even inappropriate; there are no wrong ideas in brainstorming until you got beyond the pale, you mention aliens or speculate about your neighbor's grief. BwOdystorms construct a consistency that departs from the regime of signs (Deleuze & Guattari, 1987, p. 137).

Diagrammatic does not intend to harness or restratify the BwOdystorm, it aims to create a space for the BwOdystorm to animate thinking and feeling, to pull in media objects from the virtual and actual. We can recall here earlier discussions of

[47] This is not a hazard of diagrammatic thought per se, but it is related.

diagrammatic's relationship to the book. The system creates space for destratifying the book:

> One side of a machinic assemblage [of the book] faces the strata, which doubtless make it a kind of organism, or signifying totality, or determination attributable to a subject; it also has a side facing a *body without organs,* which is continually dismantling the organism, causing asignifying particles or pure intensities to pass or circulate, and attributing to itself subjects that it leaves with nothing more than a name as the trace of an intensity. What is the body without organs of a book? […] There is no difference between what a book talks about and how it is made. Therefore a book also has no object. As an assemblage, a book has only itself, in connection with other assemblages and in relation to other bodies without organs. (Deleuze & Guattari, 1987, p. 4)

It is common enough to speak of network culture as a rhizome that de-stratifies old ways of thinking and making.[48] Indeed, such rhizomes are never found ready to hand, they must be made, and with each new error. Via the memex, net art, electronic literature, and HCI, *diagrammatic* seeks to pick up this ongoing project taking the book as a problematic rather than a historical anchor to transcend.

[48] See Janet Murray's introduction to the New Media Reader in which she discusses Deleuze and Guattari's contribution to the poetics of new media systems in relation to a short story by Jorge Luis Borges: "The two philosophers suggested a new model of textual organization to replace the ideologically suspect hierarchies of the old print-based world. The new ideal of form was the rhizome. It was as if Deleuze and Guattari had dug beneath the forking path garden of Borges (which after all was still a hierarchy of sorts) and come up with an even more profound labyrinth . . . [The rhizome] forms a pattern familiar to computer scientists: a network with discrete interconnected nodes" (Murray, 2003).

CHAPTER 3

COSMIC ANXIETY AND DIAGRAMMATIC MODES OF RESISTANCE: PORTALS, WEIRD AND EERIE RADIOPHONY, AND ANXIETY AS A CLUE

Introduction

Overview

Diagrammatic media concerns itself with the dynamicism of subjectivity and its technical infoldings. It interpolates subjectivity between the political-organizational, the interior-psychical, and the ecological-cosmological. This dissertation generates organizational strategies and tactics for a collectivity sufficient to a practice of media diagrammatics. In the last chapter, I described the *Diagrammatic* system's potential for choreographing ebullient movement of thought springing forth from *curiosity*, the chains of queer signification as they intertwine world and body, actual and virtual, individual and collective. This chapter modulates to a closely related minor key, centering movements of thinking-feeling called anxiety.

I ask what insights could diagrammatic practice of research-creation with computational media furnish about the realm of mentality? As practitioners of computational media, who understand computational thinking, aesthetics, and affect, we are specially situated to take a different tact. What if, following the Institute for Precarious Consciousness (2014a, 2014b), we set ourselves to building machines for fighting anxiety?

I provide here a roadmap of the chapter. My primary objective is to map the function of anxiety in contemporary mental life onto the prospects of a post-media era

described by Guattari. I begin in the introductory sections by motivating the problem of anxiety as an object of study through the post-lockdown context as well as feminist activist writings, which posit anxiety as a reactive affect constellating a new mode of governmentality. I scope this chapter's diagrammatic method in contrast to the psychoanalytic act. To this end I adopt a sinthomatic approach allied with the non-linearity of research-creation and the mental cartographic language of Guattari. I rehearse Lacan's four discourses to map power in my political approach to anxiety. Lacan's diagram furnishes a polyvocality employed in an experimental manner in the second half.

The latter half works through a research-creation work called *Portacular Resonances* as an object-to-think-with. The text works abductively around and through the work, seeking sufficient concepts, media objects, discourses, voices, and sonorities to articulate what the work does.[49] This section is intercalated by transmissions from a (dungeon?) master, voiced in second person, animating the reader and providing pre-given containers of agency. I detail in a manner consistent with academic media arts publications the construction of the media installation, as well as the flows of the video and sound piece to provide footholds for the readers. Using these footholds, I re-read the piece's sonic and video activities as they relate to their origins in the world through the problem of a particular anxiety – a cosmic anxiety. This lateral semiosis constellates a sci-phi or psy-phi detective novel in which the protagonist steps through portals opened

[49] Indeed, this chapter comes on the back of a handful of talks, some more experimental than others. As a secondary goal, by combining thoughtful making, research, and writing, the chapter models research-creation in a media diagrammatic mode.

by the car antenna and the radiophonic apparatus.[50] With each new plateau, we encounter a unique sonic and visual body without organs that generates an affective and diagrammatic engagement with anxiety anew. Alongside concepts and situations from Simondon, Lacan, Deleuze, and Guattari, seventies telematic art, *Arrival,* and *Stranger Things*, the protagonist discovers that anxiety is a clue for cosmic becomings more-than-one.

Re-contouring the Social Ecology in the New Age of Anxiety

In a "post-Covid" world, some are finding that parts of themselves remain locked down. A steep rise in anxiety, accompanied by mental exhaustion, grief, and shell shock, has ushered in a peculiar tendency towards interiority**.** Like a forest recovering from a fire, healing is not simply a matter of returning to how things were. Instead, we must experiment with how a new sociality might take hold at the interface with the mental and environmental ecologies. "We are all very anxious" declares the activist collective the Institute for Precarious Consciousness (IFC) (2014a). Not as a lament or a complaint, but as a call to reassemble the subjective into a conjured intersubjective, a collectivity.

The IPC's gesture towards collectivity problematizes anxiety in the context of individuation (both collective and individual individuations). If we grant that politically reactionary forces have mobilized anxiety in its various permutations (Cossman, 2018; Han, 2017; Krce-Ivančić, 2018; Salecl, 2004), we must ask, critically: How does anxiety demobilize organizational practices for activists, creative practitioners, educators? How

does it re-inscribe the rhythms of professionalization that produce what Foucault called the entrepreneur of the self (2008, p. 226)?

What are we to do with anxiety? How is it to be alleviated if it is to be alleviated at all? Do we hope to grow out of it? Do we address the real material conditions of precarity that produce it? Support mental healthcare through policy-level interventions? Do we fight anxiety, and if so, can it be defeated? Is it a wicked problem? Or can anxiety catalyze and animate new forms of conviviality sufficient to our contemporary "post-pandemic" moment? Who, anyway, is this "we"? For whom is anxiety a problem? If the diagrammatic media project is concerned with how experimental research-creation can be organized, what does the suffering of anxiety imply for institutional practices? Or, if we can speak of an enjoyment of anxiety, what of that?

I approach these questions about anxiety via a critical and creative engagement with emerging technologies. The rhythms of contemporary algorithmic media systems (always-on interaction schema (Chun, 2006; Crary, 2013; Goodwin et al., 2020; Hodge, 2021), credit scores, "the algorithm" of social media) are the bedrock on which this mutant psychic algae grows. Although I defocus digital technology in this chapter, I will work obliquely with these particularly "born digital" anxieties; I work with the analog technology of radio and the automotive in the piece *Portacular Resonances*. In this digital dark age, indulgent yet painful doomscrolling, mobilizations for and against fear-uncertainty-doubt (FUD), neurohacking hyper-productivity**,** and "going goblin mode" give us our psychic organization: a dismal circuit of anxiety and depression ("Doomscrolling," 2022; "Fear, Uncertainty, and Doubt," 2022; "Goblin Mode," 2022).

For their part in these and other incursions, Big Tech's reputation has suffered popular critique (the so-called "techlash")— should artists add their voice to the chorus? Or does anxiety, as a private experience, afford us the rare opportunity to build something social on our own mental ground?

Contexts: Anxiety, Ecology, and Research-Creation

In this chapter, I diagram a mode of anxiety via an example from my creative practice with responsive media that make its particularities legible. Anxiety is understood medically and psychologically as a feeling that some threat should be vigilantly accounted for (Crocq, 2015). Anxiety is anticipatory and oriented towards the future. In this understanding, anxiety is closely related to feelings of fearfulness and helplessness/uncontrol, although it is distinguished as preceding fear in that anxiety is said to have no object (anxiety resolves into fear once it becomes affixed to an object). Modern colloquial usages tend to collapse the distinction between anxiety, fear, dread, worry, and other symptoms, an opportunity I take to rethink anxiety socially, psychically, and environmentally.

By furnishing an object to think with from my research-creation practice, I quilt an account of an anxiety emanating from its context of environmental ecology and enmeshing itself in the mental ecology of concepts and affects (see Guattari, 2005). The project discussed in this chapter, *Portacular Resonances* a media installation using DIY sonifications of the electromagnetic spectrum, was not "about" anxiety and was backgrounded by its own idiosyncratic world-building and theorizing. Here, radiophonics and electromagnetism helps to decodes the semiotics of inside/outside, spotting anxiety

as a latent affective substrate bubbling up through ruptures in the solid lines we try to draw around ourselves.

I move through and think with this project at different speeds, putting micromoments into fullscreen, taking background and making it foreground, taking noise and making it signal. These re-situations help me to speculate about what a more dynamic or ecological practice of interventions into the experiences of anxiety may look like.

Similar to how Byung-Chul Han treats the transparency society, the burnout society, the pornographic society (Han, 2015a, 2015b), this chapter begins a longer project of enumerating anxieties without the pretense of identifying structures supposed to exist in themselves for all time.[51] Franco Berardi writes "it would be impossible to write 'A History of the Unconscious'. But it would be possible to describe a history of a psychosphere of a society" (2021, p. viii). The Institute for Precarious Consciousness helps distinguish historical epochs by the unique dominant reactive affects serving a social regulatory function. In this rubric, the industrial revolution effected misery, the post-war era maligned by boredom, and these days we find anxiety blocking possible collective becomings (2014a). I situate anxiety in its relation to the history of the medicalization of mental illness, coordinated with the history of governmentality. In our contemporary neoliberal context, anxiety interpolates the individual's perpetual burden of choice, risk assessment, and the entrepreneurial production of self. Deleuze and Guattari

[51] In contrast to structuralist formulations like Lacan's four discourses, which I manipulate and retool later.

wrote that 1968 marked the transition from the Freudian model of *unconscious as theater* to *unconscious as factory* (Berardi, 2021). If the unconscious can still be said to be a factory, anxiety is the new floor manager.

The objective of this chapter is to map the function of anxiety in contemporary mental life situated within Guattari's larger post-media project. This prompt calls both for more specificity and for a more open-ended semiotics– we need a messier ecology than computational cybernetics affords. To this end we will turn to Guattari as an ecologist. Guattari's final two solo texts, *The Three Ecologies* (2005) and *Chaosmosis* (1995), takes up ecology as a figure of thought and as the primary locus of praxis. In *The Three Ecologies,* he registers an ecosophy, borrowed from "deep ecologist" Arne Nass as a theory but also practice of thinking ecology as encompassing more than the natural world. Although Guattari deals with ecology only in his final works, Guattari scholar Berressem argues that Guattari's work was always already deeply ecological (2020).

While Guattari is best well-known for his departure from the structuralist and linguistic focus of psychoanalysis, his project retains a commitment to understanding mental life through philosophy, cybernetics, music, literature, and physics. These lines of inquiry fall under the umbrella of mental ecosophy (also referred to as mental ecology). He writes:

> For its part, mental ecosophy will lead us to reinvent the relation of the subject to the body, to phantasm, to the passage of time, to the 'mysteries' of life and death. It will lead us to search for antidotes to mass-media and telematic standardization, the conformism of fashion, the manipulation of opinion by advertising, surveys, etc. Its ways of operating will be more like those of an artist, rather than of professional psychiatrists who are always haunted by an outmoded ideal of scientificity. (2005, p. 35)

If we agree with Guattari, concerning ourselves with mental ecosophy is fundamental to imagining alternatives to the dominant media systems and telematics. To this end, Guattari's mental ecology needs technical updating. The media ecologies Guattari targeted no longer exist, and the threat media ecologies pose to subjectivity have mutated. In 1989, Guattari wrote:

> [s]ubjectivity finds itself threatened by paralysis. It loses the taste for difference, the unpredictable, and for the singular event. TV game shows, the *star system* in sport, variety shows, political life, work on subjectivity like neuroleptic drugs which guard against anxiety at the price of infantilization and de-responsibilization (2015a, p. 98).

No longer do media systems (only) placate anxiety and subdue our hunger for novelty. Today, algorithmic infrastructures appropriate our nervous systems by way of anxiety about the self, the collective, and the climate. Social media and notification systems hijack anxiety's swerve towards novelty,[52] steering it back into media ecosystems that produce value for capital. Perhaps there is nothing disordered about our anxiety .

Much has changed, but the question is still: "How do we regain control of such an auto-destructive and potentially catastrophic situation?" (Guattari, 2005, p. 43) What would it mean for media arts and science and diagrammatic media take seriously mental ecology? Guattari argues the importance of psychical issues – such as anxiety – to institutional practices: "Schizoanalysis, on the other hand, would like to say: […] these

[52] For a definition of "novelty seeking" as a personality trait, see (Arenas & Manzanedo, 2017). Here I argue it is technosocially produced or at least technologically exacerbated. This analysis is consistent with neurology research on social media addiction that compare it to gambling addition (Burhan & Moradzadeh, 2020). This research implicates a feedback loop between novel stimuli and dopamine neurotransmitters in social media addition keeping users "in the loop". In this sense we can understand social media addiction as a nervous disorder in which the nervous system is not autonomous, but host to a parasitic logic of emotional and energetic extraction.

problems are also [the organization's] and not only because of some idea of human solidarity, but also for reasons that are highly political. Because, if you do not take these problems into consideration, you will inevitably be creating a dogmatic form of politics, you will inevitably not understand the contemporary" (2015b, p. 33). We might imagine a similar argument coming from Gen Z activists, who understand this present and the future better than we ever will.

The IPC writes that labor organizations and struggles of pre-Fordist era were "machines for fighting misery," while the interventions of groups like the Situationists, the Theatre of the Oppressed, were "machines for fighting boredom". These are machinic in the Deleuzoguattarian sense: the personal yokes both the affective and economic towards a new collective becoming. IPC describes this in terms of precarious consciousness raising—borrowing from the feminist practice of consciousness raising (Randolph & Ross-Valliere, 1979; The Combahee River Collective, 2014). Like the feminist practices originating in the 1960s, precarious consciousness raising works by cracking the open secret through a collective airing of individual experiences, validating individual affective realities, and enabling the construction of an interwoven polyvocality.

The Other Side of Schizoanalysis: Towards Machines for Fighting Anxiety

Guattari, Psychoanalysis, and Machines for Fighting Anxiety

Seeking to moderate readings of Guattari as "Mr. Anti", Janelle Watson titles her monograph *Guattari's Diagrammatic Thought: Writing Between Lacan and Deleuze* (2011). Watson points out ways in which Guattari draws on the diagrammatic mode of

meaning making from his former analyst and teacher, psychoanalyst Jacques Lacan. She argues that Guattari, while not a Lacanian, is ever a student of Lacan, and embeds, mutates, and remixes Lacan's concepts in his own work. In this spirit, I find more generation than limitation through the frictions of mobilizing concepts from both Guattari and Lacan in this chapter.

While anxiety is a prominent keyword in psychoanalysis and philosophy, neither Guattari nor Deleuze devote much more than passing attention to anxiety in their writings together. Guattari was wrought with anxiety and panic attacks in his early life, which he linked to witnessing the death of his grandfather as a young person (Dosse, 2010, p. 24). It did not plague him for long, however. He writes of an interaction with his mentor and the director of La Borde:

> Jean Oury, who got me up on my feet when I was twenty, when I was pretty lost, provides a telling recipe. Many times, and at length, I explained my anxiety crises and attacks to him, without seeming to move him in any way. Until one day, he answered me with this zen-style response, "It comes over you at night in your bed, before you fall asleep? Which side do you sleep on? Okay, so all you have to do is try the other side." (1996, p. 69)

This is one of very few remarks about anxiety from Guattari. Turning away from the neurotic symptoms, much of the work inheriting from Deleuze and Guattari, including my own (Bratt et al., 2019; Johnson et al., 2018, 2019; Sha & Johnson, 2020) instead celebrates the emergence of group or collective subjectivity, the break of subjectivity from the privacy of the mind and body. Describing Oury's advice above, Guattari writes: "Analysis is sometimes like that, a little turnaround is necessary" (1996, p. 69). It is time to turn again, to try the other side. Although Guattari seems to have lost interest with anxiety with the resolution of his symptom, the first part of this chapter has motivated a

contemporary consideration of anxiety. Let us make a little turn around and take stock of what has been built up in the last five years.

Freud writes:

> If we throw a crystal to the floor, it breaks; but not into hap-hazard pieces. It comes apart along its lines of cleavage into fragments whose boundaries, though they were invisible, were predetermined by the crystal's structure. Mental patients are split and broken structures of this same kind […] They have turned away from external reality, but for that very reason they know more about internal, psychical reality […] (1989, p. 73)

Although the insights Freud describes would primarily be mobilized in his work to create the conditions for producing cures for his patients, we find here also a claim for the empirical value of psychoanalytic exploration. While I am not disinterested in the production of cures for anxiety, my purpose in writing and practice is distinct from the psychoanalytic act.[53] In part, it is a field report from the "internal, psychical reality" which sufferers of anxiety have special access too. Because the field is complex, the report is, at times speculative. In this sense I take up the IPC's injunction that we "establish new propositions about the sources of anxiety" (IPC, 2014). In short, it is a meta-model of a subjectivity, a schizoanalytic cartography marked by new sinks and eddies. *Hic sunt dracones*.

Returning to the IPC's call also for "machines for fighting anxiety" (2014), these machines engage politically by "promoting active force by defeating the dominant reactive affect." As anyone experiencing anxiety will tell you: "defeating" or even

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[53] Freud wrote: "If knowledge about the unconscious were as important for the patient as people inexperienced in psychoanalysis imagine, listening to lectures or reading books would be enough to cure him. Such measures, however, have as much influence on the symptoms of nervous illness as a distribution of menu-cards in a time of famine has upon hunger" (1957, p. 225).

"fighting" anxiety is not so straightforward. It is critical that we do not view it as such. With that said, employing the machinic approach of Deleuze and Guattari transforms anxiety from a pathological distress enacted upon and within a person to an activist struggle with a potential to catalyze new thriving transversalities amidst these antagonistic conditions. It is an identification with and enjoyment both of the symptom and of the self as symptom. Enjoyment is not a neat solution to an existential condition but is akin to activist rhythms interpolating between struggle and thriving. To this end, the cartographies in this chapter are not without an agenda (as if the cartographer can ever be without an agenda). These maps of subjectivity are prepared in pursuit of a larger question that this dissertation only begins to serve: what are the tools and components to be used to construct such a machine for fighting?

Lacan's Four Discourses and the Possibility of Resistance

One way to begin to answer this question uses a toolkit furnished by Lacan in his four discourses from 1969. For Lacan, a discourse includes spoken and written language (as we colloquially refer to language) but also "formal structural position constituted by fundamental relations of language" (Newman, 2004). Each discourse (masters, university, hysterics, and analysts) constellates mastery, power, agency, knowledge, desire, and subjectivity differently.[54] Lacan's discourses are produced through an ornate

[54] S1 is the master signifier, which has no meaning in itself. Its insertion into the discourse orders the remaining signifiers.

S2 is the corpus of signifiers into which S1 intervenes. These exist ahead of time as an "already constituted field of signifiers" which embody knowledge (ibid. 15).

$ is the divided subject that comes into exist when the ordering signifier S1 enters the S2, the field of signifiers.

a is *le objet petit a,* an evasive object of desire. While the evasiveness of the object precludes its enjoyment, the subject finds an enjoyment in their repetitive failure to grasp the object. Lacan uses the term surplus *jouissance* as a reference to Marx's concept of surplus value. (For Marx, capital seizes the surplus value produced by labor's transformation of resource capital, rendering it as a profit. In Lacan's master's discourse, the master scrambles to seize the surplus enjoyment rendered by his mobilization of the slave).

Each position in the matrix designates a specific function. The top left position is the agent of the discourse. The agent speaks and orders the discourse. Below the agent in the bottom left is the truth of the discourse, what is supposed by the agent.

The top right is the recipient of the discourse from the agent, what is put to work by the discourse. Below it on the bottom right is the product of the discourse.

The left and right sides are opposite one another and operate in opposition.

Lacan is clear that we must begin with the master's discourse because of its historical inertia in the history of philosophy. This suggests also that other discourses are derived from it or result from the transformation of that structure. Indeed, the positions in the matrix are molded by the master's domination; subsequent discourses resonate that either consonantly or dissonantly. In the master's discourse: the master speaks to others, animating them to produce a surplus. The master attempts to capture the surplus in pursuit of their barred subjectivity — a subject which is irrevocably split from its entrance into language.

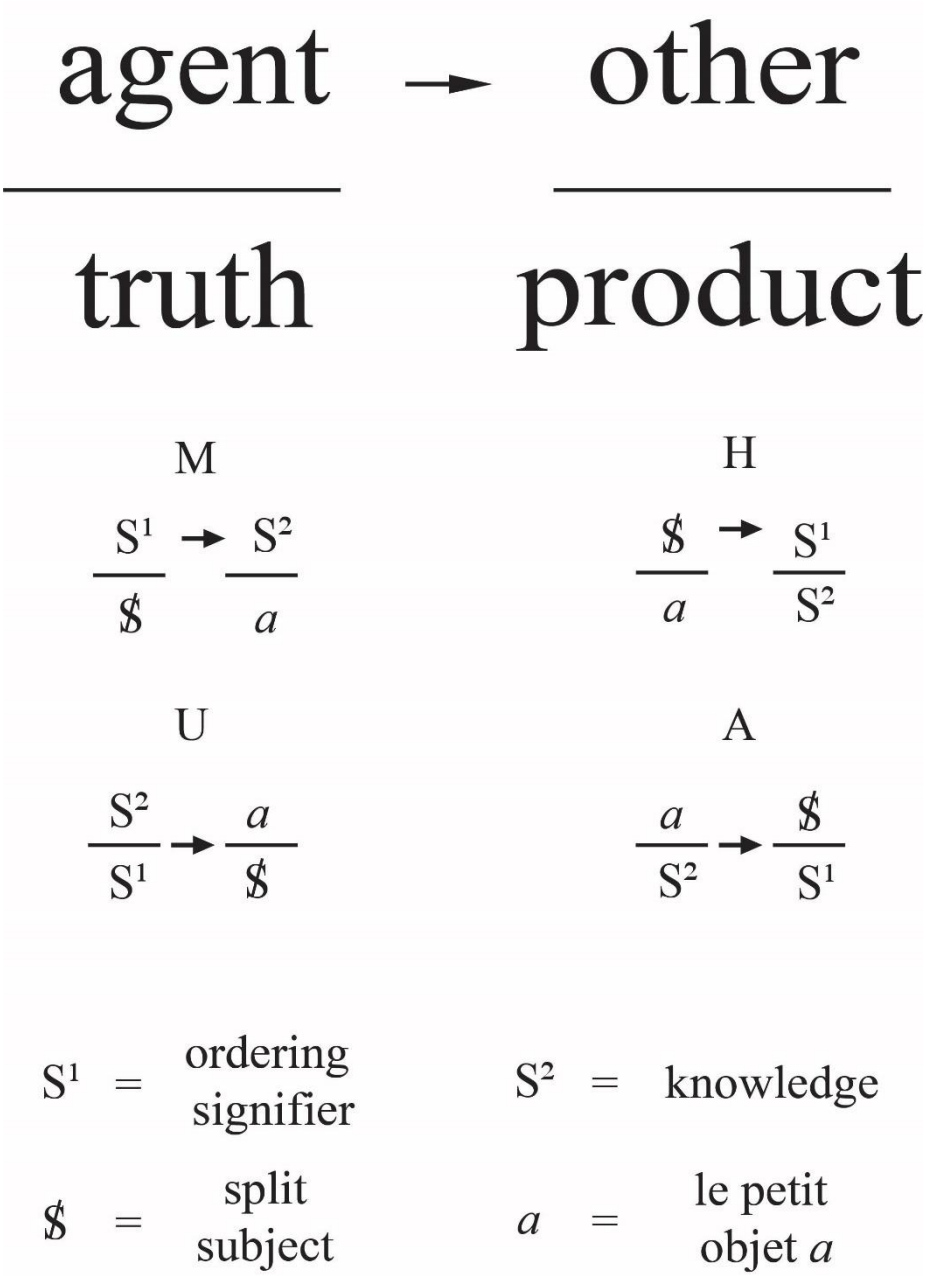
Rotating the terms once to the right, we produce the hysteric's discourse. It is well-known that Freud devised psychoanalysis in response to dealing with patients with uteri diagnosed with hysteria. This discourse is not only occupied by women, but men too. Hysteria, characterized by flowing speech, greases the wheels of transference in the psychoanalytic session. The hysteric's discourse is ordered by the $, the split subject, and underwritten by *a*, the subject's enjoyment of its symptom. Effectively $ speaks to S1, looking for a master, demanding it produce knowledge, S2.

Turning again, *objet petit a* occupies the agential position in the analyst's discourse. The psychoanalytic session is structured by the analyst so that the analysand's desire structures discourse. Knowledge underwrites this arrangement. According to Lacan, this can be "analytic know-how", or knowledge gleaned from listening to the analysand (ibid. 35). Knowledge is also in the discourse's truth position, informing the character and aim of interpretation in the psychoanalytic act. This knowledge is something which we might say "rings true".

In the university's discourse, knowledge speaks to surplus (desire, enjoyment, experience), producing a subject that continues the discursive cycle. This cycle is underwritten by and guarantees its truth: the master, ordering signifier. Lacan refers to the university discourse as the modernized master's discourse.

Despite the formal constraints of the discourse's fourfold structure and his insistence of its structural authenticity, Lacan also added a fifth capitalist's discourse which obviously disrupts the formal coherency of the four discourses. Like the others, this permutation takes its starting point from the Master's discourse. However, instead of a turn transformation, the left-hand side of the matrix is inverted, and the right is left the same. As a result, the subject ($) is in the agential position (as in the hysteric's discourse). $ is effectively sitting in for the master, which is the discourse's truth (as in the university discourse). S speaks to and intervening in and mobilizing knowledge (S2) to produce surplus *jouissance* (*a*), just as in the Master's discourse.

Figure 3: Lacan's four discourses. The fourfold up top describes the schema by which the permutations operate At the bottom are approximate definitions of the signifiers (although Lacan fleshes these out generously in his seminar. In the center are the four discourses: Master, Hysteric, University, and Analytic.



matrixial diagram that affirm this deep interlock. The four discourses "locate a moment" and the meaning of that moment (Lacan 2007, 15). These four discourses are described as structures which have not been "abstracted from any reality", but rather are already

"inscribed in what functions as this reality" (Lacan, 2007, p. 14). Each discourse is a 2x2 matrix, produced by a simple transformation operation. The terms that populate the cells of the matrix are S1, S2, a, and $.

If, for Lacan, "language is the condition of the unconscious" (Lacan, 2007, p. 41), the four discourses provide significant insight into the conditioning of the subject in the situations to which the discourse is endemic. Examining and experimenting with the discursive modes outlined by the four discourse's help to scaffold diagrammatic interventions into social and organizational practices. While identified by particular institutions (slavery, the academy, bourgeoisie society, the clinic), these discourses circulate beyond those organizational bounds (Žižek, 1993, p. 107). One could locate the analyst's discourse in the situation of a particularly responsive artist's critique (so too could the university, master, hysteric, or capitalist discourse). Likewise, a single person may take up different discourses in a single evening. What is more, despite Lacan's insistence that the discourses exist in the world and are guaranteed by the formulaic relations that produce them, Lacan himself added a fifth "capitalist discourse" later. Lacanian analyst and philosopher Levi Bryant takes this a constructive openness a step further by explicating three further discourses implied by the capitalist discourse: the biopolitical discourse, the discourse of immaterial labor, and the discourse of immaterial production (Bryant, 2008).

Marked by a departure from any pretense of objectivity, this chapter experiments with productions of subjectivity by phasing between discursive modes. These phase changes happen in the text itself, in the readings of the research-creation, and in the work

itself. Instantiating a particular epistemological anarchism (Feyerabend, 1993; Manning, 2013; May, 1994), Lacan's four discourses will not receive equal coverage, and perhaps some new ones are invented along the way that will only be observed once the journey is over.

Primarily, this text is occupied by a hysterical searching and noodling.[55] But the hysterical is, as Michael Oyer writes, a pharmakon (Oyer, 2015). On one hand, it greases the wheels of the transference catalyzing the psychoanalytic act. But on the other, as Lacan says to the student uprisings in France: "Revolutionary aspirations have only one possibility: always to end up in the discourse of the master. Experience has proven this. What you aspire to as revolutionaries is a master. You will have one!" Here Lacan locates the recalcitrance of the protest's subjectivity as the agent of the hysteric's discourse. This implicates revolutionary unrest in the larger historical interpolation between the master and hysteric (Oyer, 2015), condemning uprising to reaffirm the masters discourse and reinvent new forms of domination (Newman, 2004). If we are to build machines for fighting anxiety, if we are to re-imagine the way in which creative making-thinking-feeling is bound together, the hysterical will not get us all the way there. Nor will the university's discourse, which bears the master as its truth and re-inscribes its power.

Although the goal remains an escape of the master, to make "a line of flight" (Deleuze & Guattari, 1987) outside anxiety, the objective is not to emerge with one

[55] The inconsistency in switching between discourses might be interpreted as hysterical, a position of good company. Lacan marks Hegel as that "most sublime hysteric" and counts scientific pursuit of knowledge as a hysterical act.

discourse to valorize and another to condemn. After all, the agents of these discourses "correspond to an abstract psychosocial type, the embodiments of which ''we'' meet everywhere" (Stengers, 2008, p. 42). Although cut from the cloth of a different project, Stenger's remarks might guide our experimentations here as well: these discourses exist:

> …both in our (often academic) worlds and in our heads – in my head at least. And I will not cut my head off in the name of a ''pure'' outside that would demand disavowal and recantation. I will not attempt some kind of artificial reterritorialization that would hopefully ''save'' me from what is part of my own (constructed) identity. (2008, p. 42)

The mechanisms of machines for fighting anxiety will be more intricate, and their engagement more tactful. If suffering from anxiety is to be terrorized by uncertainty, demanding an end to precarity will only reproduce the substrate that recklessly exposes people's minds and bodies to contingency. The experiment is to re-factor the discourse matrix *in the field* and see what happens.

But the hysterical will get us started. Instead of a condemnation, we might instead take Lacan's statement as a caveat: "Hysteria is a *pharmakon*: neither and both active and/or passive, masquerading seduction and/or incessant truth-telling, conservative and/or revolutionary; it is a site of irreducible ambivalence and danger" (Oyer, 2015). The hysteric poses a question. For Lacan, this question implies a subject who knows the answer (Lacan quoted in Oyer, 2015). This moment of mythic conjuring catalyzes in turn transference with the analyst, who seizes upon the gap to revolutionize the subject (Newman, 2004). We are again not concerned with the traditional psychoanalytic act; instead we surf along the hysteric's question and the anxiety symptom.

In the context of the diagrammatic media project's overarching interest in generating forms of organization sufficient to revolutionary media practices, this project

pursues a critical anarchism (May, 1994; Newman, 2015; Rousselle & Evren, 2011) that hedges the caveats borne of psychoanalysis's conservatism. Contra the ideals of anarchism, the insights of psychoanalysis strongly suggest that we cannot simply clear away hierarchies and expect a fully egalitarian non-situation to emerge. Extra-rational reactionary forces from within and without guarantee the re-emergence of the master. Organizers in radical feminist movements have observed this (Freeman, 2013). What is left but a motivation and enthusiasm for technocultural experimentations to moderate, modulate, delimit, and re-route power, knowledge, and enjoyment? Like a modular synthesizer, I employ the polyvocality of the four discourses in the section below to weave a notion of cosmic anxiety through the research-creation project *Portacular Resonaces*.

Portacular Resonances

[transmission 000: changing gears]

Changing gears, you accelerate bearing east, passing over the 101. You cross over the canal which is at once:

a transversal bore through the settler grid thrown down as an oppressive tabula rasa
a cut in the valley demarcating the land into municipal parcels (goodbye Tempe, hello Mesa)
a portacular relic of the Hohokam traversing deep time-scale engineered life flow into the uncanny valley of the sun

You cross over into Mesa, the 34th largest city in the US inside the fifth largest urban area, and, perhaps to distract from the high concentration of poverty you are temporarily passing through, you fumble with the stereo and click on the radio, still set to factory settings. AM tuned to 530kHz. You don't hear conservative talk radio, Christian evangelism, or cumbia. You don't hear any station broadcast at all—only the sound of radio atmospherics.

Approaching a stoplight at an intersection matrixing sixteen discrete lanes of automotive traffic and two lanes of light rail, you need your hand to change gear again. Or maybe you have an automatic transmission and your hand is free to noodle towards some other station. Or maybe you are in an Uber. In 2018 you are in an Uber with an engineer testing an autonomous driving system.

No, you're not, it's 2019 and Uber's autonomous driving program was canceled. You had to change gears and you're at a stoplight, next to a lightrail station. A train opens its doors and twenty people pour out onto the concrete platform. The platform radiates 150-degree heat through their shoes and up their legs, into their faces on a breeze. You're distracted by a feeling: empathy, then by shame, then by empathy again. Your feeling is interrupted by a splash by a coolness that could only come from a deep well of feeling winding through Phoenix's timeline, across the canals bringing water to the desert, and beside the electrical wires powering the train.

The lightrail departs the station before the auto traffic light signals your own departure and you are splashed again, this time by sound. Not the engines muffled by the

glass window – what you hear comes from your car speaker. You are feeling open, you turn it up, you drop into an upside-down, you pass into a minor key.

Key signature: no sharps, no flats.

Turn information theory on its head: let noise become signal, signal become noise.

What speaks is a radiophonic sonification of fluctuations of the electromagnetic field. These fluctuations are caused by natural and anthropogenic electrical activities alike: lightning, semi-truck brakes, solar flares. These frothing, pulsing, undulating sonorities pull one into the tide, beckoning one to surf along the infrastructure of the you once heard called infernal city of Phoenix, to diagram serendipitous attunements to excesses and entropies of monstrous complexity in motion, amplifying otherwise tacit aberrations from the efficiency and control of managed urban infrastructures and ecosystems.

Enjoying your Anxiety? Intersubjectivity, Emotion, Aesthetics, and the Mental Ecology

I have written before about responsive media environments and choreographic techniques for catalyzing moments of trans-subjectivity, what Guattari called "group subjectivity" early in his work (Bratt et al., 2019; Johnson et al., 2018, 2019; Montpellier et al., 2015; Sha & Johnson, 2020). My interest in this stems from my practices in musical performance and improvisation which regularly provide the opportunity for enjoyment. That playing music can be enjoyable is uncontroversial, but my mentioning music and enjoyment is to begin to instruct anxiety in relation to emotional experience, creative practice, and mental ecology. An upshot: enjoyment and anxiety are not mutually

exclusivity; indeed, their placement in mutual inclusivity assembles a machine for fighting the reactive forces compelling us to anxiety.

Following process theorist Alfred North Whitehead, we can understand enjoyment in relation to lived emotional experience: "life is the enjoyment of emotion" (1938, p. 229). Whitehead points out the temporal aspects of emotion, in that emotion is "derived from the past and aimed at the future." This rhymes with Lacan's model of subjectivity which anchors emotional and indeed aesthetic experience in a particular moment of infancy. For Lacan, the infant subject is irreparably split by its immersion into signification, which effects a collapse of the emotionally and aesthetically enjoyable intersubjectivity between the infant and the mother. Our emotional experience of the world repeats—with a difference—the mother-infant intersubjective enjoyment. Psychoanalyst Christopher Bollas calls this differencing repetition of emotional experience and its aesthetic character "the shadow of the object" (1987).

We can psychoanalytically extend ethnomusicologist Christopher Small's concept of musicking (2012), an embodied and processual account of social musical experience, to demonstrate the restructuring of intersubjectivity through shared aesthetic experience.[56] In such musical situations we can also assume there is both shared and divergent emotional experiences. Likewise, I cannot speak to my own musical practices only in terms of a pleasurable enjoyment; the nervous affective substrate that conditions spontaneity in a group improvisation on one day might dull collective attenuation on

[56] The connection between intersubjectivity and music (in particular sacred music) has been made in (Cantz, 2013).

another and derail the performance entirely. We must consider Whitehead's conception of life as the enjoyment of emotional experience—and by my own extension aesthetic experience. What else can be meant by Deleuze and Guattari's equation that "[m]usic is never tragic, music is joy" (1987, p. 299)

On a sunny Summer Sunday, I sit down at the two-manual electric church organ in front of a quarter-full chapel of Presbyterian churchgoers in Parkersburg, West Virginia.

My hands are shaking. Why are my hands shaking?

What do I think they think of me?

My hands fumble through the hymn I practiced for hours and hours.

And now? What do they think I think of them now?

Brian Massumi speculates that Deleuze and Guattari might call philosophy a "music with content" sooner than call music philosophy (1987, p. xiii). This leaves the status of music ambiguous. Can we say music is without content? At best, musical experience dispossesses the kinds of philosophical contents Massumi refer to into the shadows. But something is always creeping—in lyrics, in a musical hermeneutics of tone poetry, etc. Music may or may not have a content, but it always has a context (à la Small 2012).

Something remains apart from lived emotional aesthetic experience: the order of signification that for Lacan alienates the subject from itself. Musical experiences often require some temporary relinquishing of spoken discourse to allow us shade in the intersubjective object of enjoyment, but discourse lurks in the shadows. Musical

experience's failure to exorcise signification shades enjoyment; musicalities intersubjectivity is always shadowed by an asignifying precedent. Here is where though creeps in. Whitehead distinguishes life, the enjoyment of emotions, from mentation:

> Mentality involves conceptual experience, and is only one variable ingredient in life. The sort of functioning here termed 'conceptual experience' is the entertainment of possibilities for ideal realization in abstraction from any sheer physical realization. The most obvious example of conceptual experience is the entertainment of alternatives. (1938, p. 229)

Returning to the special case of anxiety, Whitehead's language of conceptual experience and the entertainment of alternative recalls the earlier discussion of anxiety's anticipation of alternatives as a dark design thinking or speculative philosophy. Whitehead's distinction between lived emotional experience and mentation clarifies the intertwined affective and mental dimensions of anxious experience. Such a distinction recalls the split between the mental process of signification and the aesthetic and emotional experiences of intersubjectivity in Lacan. Despite pleasant or painful valence, anxiety is *enjoyed* as a lived emotional experience. Anxiety as lived emotional experience is activated by and activates vectors of thought.

As purveyors of aesthetic experience, musicians and artists have special access to the enjoyment of emotional experience. In turn, we can understand create practice as having unique purchase on the conditions of intersubjective production, and by extension, the seepage of signification into such experiences. This situation allows a unique perspective on anxiety; the enjoyment of anxiety would have a machinic character that transverses the mental processes and emotional experiences. Critical, speculative, and indeed diagrammatic creative practice broadly allows a unique experimentation in this liminal space. Besides their institutional critique, Lacan's four discourses, which frame

the specific moment of subjectification through signification, are useful to my own project as an experimental medium.

Who's Afraid of Rhizomatized Relations?

Who is afraid of rhizomatic relation? The rote answer is he whose power comes from trees (trees of knowledge, trees of phylum, decision trees, etc.). A rhizome is that thing which "fosters connections between fields, the removal of blockages on bodies without organs, the maximum opening of bodies without organs onto a plane of consistency" (Deleuze & Guattari, 1987, p. 6). In this chapter, I am concerned with a rhizomatics effecting an opening through a rapid removal of blockages, blockages which we might consider helpful and enabling, blockages that shield our sensitivity and vulnerability, that turn us away from the gurgling cosmos: the position of anxiety.

Later, the proposition of a rhizomatic becomings (an encounter with a BwO) produces a moment of anxiety in relation to the individual and this question of collectivity. In a sense, I take up the problem of Deleuze and Guattari again from a different angle: "How can we fabricate a BwO for ourselves without its being the cancerous BwO of a fascist inside us, or the empty BwO of a drug addict, paranoiac, or hypochondriac?" (Deleuze & Guattari, 1987, p. 163) But first we must start in the middle of it, in the thick of the anxious milieu, and diagram this emptying body without organs.

Art Process and Installation Overview

The introduction above reflects on a collaborative artmaking-, thinking-with practice from 2019 and early 2020 which I developed with collaborator Brandon

Mechtley.[57] After our initial forays into automotive radiophonics practice, we experimenting with giving "guided tours" to visitors coming through our department. Less of a sound walk which fetishizes serene listening experiences, these tours were opportunities for reflections and discussions about the extensiveness and intrusiveness of urban infrastructure or deliberations about the Anthropocene. We did field recordings, motivated not by the archive fever or elegizing impulse of acoustic ecology. Along with the AM radio recordings, we used dash cams to create images simulating vectoral automotive embodiment.[58] These recordings became material for the media installation *Idiotic Resonances: Uncanny Valley of the Sun.*[59]

In this piece, we sliced the video frame into three discrete channels displayed on as a triptych of cheap flat-screen TVs or computer monitors rotated to a vertical, portrait orientation. Each video channel was linked to a discrete, monophonic audio channel played from dedicated speakers (either DIY parabolic speakers overhead or from speakers near the TVs. See images in this chapter for detail). Except for EQ and compression, the audio is unaltered from what was recorded directly from the car stereo into a Zoom H6. Anytime a video stream appears, the audio channel recorded with it is also sonicly displayed. Each video monitor is driven by a dedicated Raspberry Pi Zero W

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[57] Special thanks to project collaborator Brandon Mechtley, who introduced me to the 530AM practice, which he developed with his friend Sam.

[58] This automotive mode of moving through the world is typical for the North American city of Phoenix. The city is extremely unwalkable, and public transportation is poorly funded.

[59] The video context of the installation is viewable here: https://www.youtube.com/watch?v=LLjcZgxuLpQ.

Figure 4: *Portacular Resonances* recording setup included a modified sedan dash allowing us to plumb an unbalanced audio line out to audio recorder and mounted GoPro camera.

microcontroller, which handles the synchronization of the 9 minute and forty-seven second audio-video loop across the three screens via networked UDP messages.[60]

The source material is never synchronized across all three screens. We used non-linear editing techniques across the three video panels to disrupt and recompose the time of the recorded event. Cutting forward or backward on a single screen allowed us to put different radiophonic sonorities in consort or chorus with one another (see 4:50), or to

[60] We used a software repository called OMX-player-sync: https://github.com/turingmachine/omxplayer-sync. This is based on the popular and lightweight video playback tool back OMX-player: https://github.com/popcornmix/omxplayer.

reinforce the rhythmicity of certain the found sounds (see 1:13-3:00). This segmentation of the digital image across multiple screens suggests a non-human perception, such as the computational perception employed in autonomous cars.

Figure 5: *Portacular Resonances,* still from the intro section.

The automotive point of view, familiar to us from the dash cam videos popular on the web, is structured by a normative focal point on the horizon around which the world unfolds. Playing identical video content across the display with subtle delays of 1000ms between the monitors created horizontal movement across the field of vision (0:00-1:13), accentuated while more significant delays of 5000ms create decentered spatial-temporal attractors (8:00-8:20).

To engage with the piece, folks were invited to sit on bench seat salvaged from an old van. The audio streams were summed and pitched down several octaves before

Figure 6: Left: *Portacular Resonances* installed at SLSA 2019 in Irvine, California. Right: the installation in studio during prototyping.

displaying through a bass transducer installed in the car seat.[61] The audio, video, and haptic configurations intended to emphasize the physical permeability of bodies by the electromagnetic field, the strange localities of directional waves.

Video Sections

The piece is in three parts; I will describe them here and draw attention to certain elements the rest of the chapter will use. In the opening section (0:00-2:56), the car turns into the rear of a suburban strip mall, creeping along in midday—an unintended nod to

[61] This is an obvious exception to the previous statement that audio media was unaltered. In addition to being pitched down, we normalized the amplitude range of this track to make the haptic effect more palpable.

the Winkie's Diner parking lot scene from West Coast horror noir *Mulholland Drive* (2001). As the car turns a corner, the noisy sonic interference subsides, and two slow tones become discernible. The tones stutter, either on or off. The car halts as the tones become sonically foregrounded; the slight offset in their periodic rhythm creates a polymetric phasic that plays out over several minutes. Video cuts in the left and right panels accentuate the polyrhythms. The source of these sounds is not to be ascertained.

The middle movement (2:56-5:00) is a proverbial palette cleanser. The car proceeds through a carwash which is outfitted with RGB LEDs. There is little sonic activity.

In the final part, we find ourselves at a stoplight on the streets of Tempe at night. The car pulls through the light, a drone with a strong and clear fundamental frequency emerges from the static as the car saddles up next to the light rail. The drone is interrupted (modulated?) intermittently by a rapid, non-periodic flanging sonority. The remainder of the piece displaces these sonorities in heterophony across the three audio-visual channels.

0:00-2:56 // Feeling Weird and Eerie, Becoming Cosmic

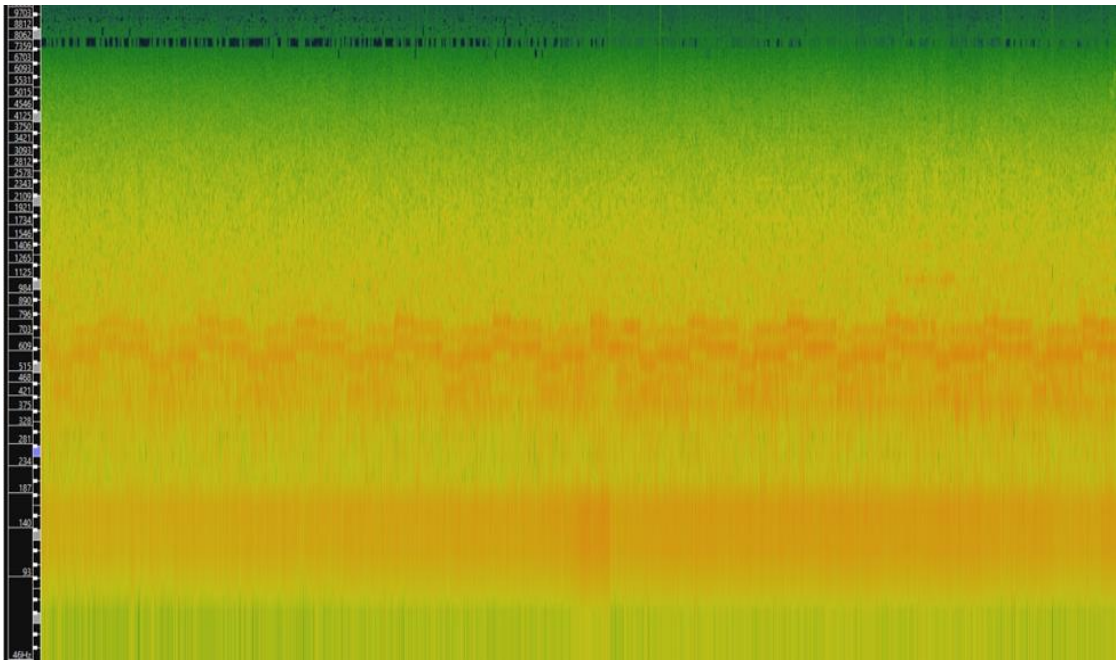
In our automotive-radiophonic field recordings of Phoenix and the compositional process, we were lured by rhythmic interplays between a) sound where one would not expect it (what felt like secret sounds, or easter eggs, effects without identifiable cause) and b) silence where one would (cause without expected effects). What activates this lure? Let us turn to Mark Fisher's interwoven concepts of the weird and the eerie, which operate more dynamically than the Freudian unheimlich – castration anxiety machine

Figure 7: Cosmic anxiety diagram. See footnote 62 for a description of how it is produced.

(Fisher, 2017). The weird ("that which does not belong") and eerie ("Why is there nothing here when there should be something?") play at an open system, or rather, the entrance of something novel to that which was previously treated as closed. The entrance of that novelty "allows us to see the inside from the outside." Fisher says this can the starting point for a "weird psychoanalysis": "the eerie is fundamentally tied up with questions of agency. What kind of agent is acting here? Is there an agent at all? These questions can be posed in a psychoanalytic register—if we are not who we think we are, what are we?" (2017, p. 11)

The first segment of the piece (0:00-2:56) attends primarily to the weird: the strange polyrhythm fixed in place when no source in sight. What precedes this though is the slow forward lurch of the car.

Figure 8: Spectrograph from *Portacular Resonances* 1:30-2:02. Note the concentration of energy in the frequency bands from 450-780hz, where one can distinguish two distinct tones.



As the vehicle moves forwards, the vectors proceed outwards from a center point of focus. [62] This visual pattern of movement is a useful homology to diagramming vectors of subjectivization in the mental ecology as it dilates in its anxious state. Like the tide pulling at sand into the sea before the crash of a wave – only no wave comes.[63] It is a particular disposition, entropic and unattenuated, scattered and dispersed. The emergence

[62] This diagram was produced using a computer vision algorithm from a family of motion-estimation techniques called optical flow. Comparing consecutive frames of video, the algorithm seeks similar pixel values within a local range. If correspondence falls within a given tolerance threshold, that algorithm assumes that the object in the visual scene has moved, and by extension pixels are the same thing. Arrows visualize the movement of such pixels as vectors. I created it with code by Jeff Thompson (https://editor.p5js.org/jeffThompson/sketches/DfsmBZ9O0) based HS flow implementation by Kyle McDonald (https://editor.p5js.org/kylemcdonald/sketches/rJg3gPc3Q).

[63] For a relevant sonic image, consider the introduction to the track "Black Snow" on the album *Age Of* (2018) by Daniel Lapotin (aka Oneohtrix Point Never). A descending electric bass ostinato is accompanied by a recording of deliberate and focused inhales, but no exhales. The lyrics of the first verse: "Black snow is coming, saw it on TV / No information, no harmony / Yeah, a wave of black snow."

of acousmatics in the field weirds the subject (out). This weirding produces a blockage in which the body fixes and immobilizes while, in disassociation, the psyche hypermobilizes to scour the world for a problem. By problem, I mean a threat, a source to be resolved to the feeling, a subject who knows the answer. Following Simondon's description of anxiety: "there is no longer a world nor problem that is not a problem of the subject" (2020, p. 283).

Simondon describes anxiety as a "blockage". This could easily be misunderstood for the *feeling* of fixedness or being stuck. But the feeling of anxiety described by Simondon is the opposite: "the subject dilates painfully by losing its interiority; it is here and elsewhere, detached from here by a universal elsewhere; it assumes all space and all time, becomes coextensive with being, spatializes, temporalizes, becomes uncoordinated world" (Simondon, 2020, p. 283). To understand what Simondon means when he talks about anxiety as a blockage, we must briefly rehearse his ontogenetics of the individual. For Simondon, the *fortspinnung* of individuation requires the individual to draw on an inexhaustible well of possibility which he calls the pre-individual analogous to what Bergson and Deleuze called the virtual (Bluemink, 2020). While the individual is a phased singularity, the pre-individual is de-phased, simultaneous, always more-than-one. The individual phases both psychically (interiorly) and collectively (exteriorly). Collective individuation is conditioned in response to the environment. The amalgam of the collective and psychic individuations constitutes the transindividual (Barthélémy, 2012, p. 214; Combes, 2013). To solve a problem provoked by the world, individuation

requires the subject (the concretized individual) to open or fracture so that aspects of the pre-individual, a sea of potentials, may be absorbed into it.

When no solution to the conditions of the environment (society, the associated milieu) can produced from the pre-individual, there is no collective individuation and the psychic and collective individuals become semiotically dissociated. As Nony summarizes: “when the individual is preempted from the possibility to openly develop its potential it creates a conflict that disrupts the coherence of its relation between itself and society” (2017, p. 106). The individual, now neurotic, regresses into the pre-individual searching desperately for bonds of signification which would allow it to resolve to itself to the collective.

Timestamp 1:47. The car finally halts to attend to these weird sounds. The left and right panels synchronize with the two tones respectively, cycling aimlessly through other footage from different days and at different times. “Anxiety becomes a moment in which the present loses its actuality by flattening the past and the future into one blended landscape in which the individual attempts to flee from the lack of dense experience” (Nony, 2017, p. 107). The body is planted but the mind follows its senses towards sounds which seem to come from nowhere. “This universal counter-subject that develops is like a night that constitutes the very being of the subject in every point; the subject adheres to everything as it adheres to itself; it is no longer localized, it is universalized according to a passive adhesion that makes it suffer” (Simondon, 2020, p. 283). The mind explodes across the universe in search of a source, but really in search of an answer: What should I do with you? What do you want from me?

Anxiety does block the forward motion of the process of individuation by effecting a regression into the pre-individual, but equally important is its status as an aggravated tension between the individual's singularity and its collective. This is not so different from Lacan's concept of anxiety: which is the sensation of the desire of the other, but furthermore to have an uneasy and unknowing relationship to it. For Lacan anxiety is not "without an object", rather that we sense that we are an object for the *other* us. That we are unable to know that object means we are in turn unable to know their desire – what they want from us.[64] Via the weird radiophonics, I want to now put this pliable Simondian-Lacanian anxiety and its implications for collectivity into the broader project about subjectivity. To do so, we must speak of aliens from outer space. Because what is weirder, in the Fisherist sense, than an alien species descending upon Earthen soil?

Cultural geographers Hynes and Sharpe outline a notion of "cosmic subjectivity" (2021) via engagements with three sci-fi film, asking "How are the intensive, deterritorialising forces of alternate ontological universes composed to form new vectors and machines of subjectivation?" (2021, p. 312). Here, cosmic refers to the contraction of *chaos* and *cosmos* from Joyce and picked up by Guattari: the chaosmos, at once the externality of the subject but also an infinite set of possible universes. With no recourse to any universalizing subject, this cosmic subjectivity "names a production that draws from a maximum of ontological universes" (Hynes & Sharpe, 2021, p. 312).

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[64] Lacan describes especially the neurotic's proximity to that desire.

The authors give the final film *Arrival* (2016), directed by Denis Villeneuva and based on a novella by Ted Chiang, highest marks against the Guattarian rubric for its "processual account of subjectivity more adequate to the openness of the future" (2021, p. 312). In the film, a dozen hulking obsidian ovular ships suddenly descend upon Earth scattered across the globe. The protagonist, an academic linguist named Dr. Louise Banks, is brought to Montana to translate the visual, sonic, and gestural messages from two lifeforms shielded behind a semi-translucent wall in the craft's interior. Working in parallel with teams around the world, the protagonist, Banks is constantly reminded of her mandate to answer the military's big question: why are the aliens here and what are they after?

The first act of the film is driven by this genre-typified anxiety (allied with Lacan's anxiety): what do they want with us, do they intend to obliterate the world, enslave humanity, and so on. In addition to depicting mass media coverage of public pandemonium caused by the spacecraft's appearance, the film makes clear that the public too is searching for meaning: a religious cult commits mass suicide interpreting the 12 ships as a sign of the end times, pointing to mass paranoid psychosis.[65] Meanwhile Banks discovers China's translation team uses mahjong as a translation apparatus, prompting

[65] Deleuze and Guattari describe the paranoic regime of signs: "This is the situation Levi-Strauss describes: the world begins to signify before anyone knows *what* it signifies; the signified is given without being known. Your wife looked at you with a funny expression. And this morning the mailman handed you a letter from the IRS and crossed his fingers. Then you stepped in a pile of dog shit. You saw two sticks on the sidewalk positioned like the hands of a watch. They were whispering behind your back when you arrived at the office. It doesn't matter what it means, it's still signifying" (1987, p. 587).

her to remark a concern about locking signification into a game theoretical subjectivity caged by suspicion and agonism.

In a session with the heptapods, Banks reveals her face from behind the biohazard suit crossing an eventual threshold setting into motion the resolution of a Lacanian anxiety)[66] and the onset of one recognizable for Simondon. Unmasking her visage effects a signification of Banks as individual anchored to the signifier "Louise" (Hynes & Sharpe, 2021, p. 316). This fixity concretizes some (but not all) aspects of what Banks is for the aliens. Although it is not yet clear what the two tentacular aliens instrumentally want from her (and humanity— a later plot point), the viewer gets the sense that there is a trust developed that dissolves the concern around the question "*What does He*[67] *want concerning this place of the ego?"*(Lacan, 2014, p. 6).

The encounter marks the onset of a Simondonian anxiety blocking Louise's individuation. Through jump cuts and dangling audio streams that create seams in time and space, after this encounter Banks begins to experience sparse visions of mothering a child who dies from "an uncurable illness". Although the viewer is led to believe these are intrusive and traumatic memories triggered by her encounter with the aliens,[68] it is

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[66] Lacan uses a surreal anecdote to illustrate his understanding of anxiety: "Myself donning the animal mask with which the sorcerer in the Cave of the Three Brothers is covered, I pictured myself faced with another animal, a real one this time, taken to be gigantic for the sake of the story, a praying mantis. Since I didn't know which mask I was wearing, you can easily imagine that I had some reason not to feel reassured in the event that, by chance, this mask might have been just what it took to lead my partner into some error as to my identity. The whole thing was well underscored by the fact that, as I confessed, I couldn't see my own image in the enigmatic mirror of the insect's ocular globe" (2014, pp. 5–6).

[67] Here: the Other.

[68] The film's opening scene establishes that Banks raised and lost a daughter. By virtue of the viewer's bias towards linearity, this opening blatantly plants the seed that these events are in the past rather than the

dramatically revealed these are in fact premonitions. The aliens are unstuck in time and their language allows them to surf it non-linearly. Initially disoriented by these appearances, she begins to go *with* them, eventually leading to the film's resolution.

For Simondon, individuation is a process drawing from but never exhausting the pre-individual and generating both collective and psychic becomings. Collectively, Banks discovers a niche of belonging among the aliens wherein her individuality circulates ecologically (just as her name circulates discursively). Psychically, she begins grappling the displaced and distemporalized visions into which she was rhizomatically plunged. In so doing, she emerges from her anxious saturation of the pre-individual by constituting semiotic chains that fortify new semiotic chains from the Louise pre-individual.

If *Arrival* gives us a model of cosmic subjectivity, we could also address its portrayal of a *cosmic anxiety* which precedes that subjectivity. We should distinguish cosmic anxiety from the cosmic horror associated with the stories of H.P. Lovecraft and his imitators.[69] Whereas Cthulhu and the Old Ones induce a trembling before the vast cosmos that cannot be correlated with the human noosphere[70], cosmic anxiety is an

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future. It is not clear that Banks herself is experiencing this as a vision, but the opening seems to work as a foundation for this dramatic twist.

[69] There is no doubt that cosmic horror is at play in this story, but unlike in Lovecraft, we always find it in passing and in the periphery of the protagonist.

[70] Related to James Lovelock's and Lyn Margulis's Gaia hypothesis (Clarke, 2017; Lovelock, 1972), the concept of the noosphere was elaborated by Vladimir Vernadsky in distinction to the biosphere. In this context the noosphere describes the whole of more-than-human knowing (Svoboda & Nabert, 1999). A quote from Deleuze and Guattari may be instructive to help demarcate the limits of the noosphere: "There is no biosphere or noosphere, but everywhere the same Mechanosphere" (1987, p. 67). The Mechanosphere, which they all call the rhizosphere (1987, p. 74), is the set of all abstract machines and machinic assemblages.

unanticipated rhizomization, a confrontation with the weird and eerie, a fear of a descent towards entropy at the level of subjectivization, an ego death anxiety, or more specifically, horror before collapse of the person machine held together by human institutions. What is more about *Arrival* is that we witness the transition of cosmic anxiety into a cosmic subjectivity.

The film's biggest upshot: anxiety is a clue. It unbinds us from here and now and presents us with all possible other worlds (although only few may come to mind).

[transmission 001: cloud bounce]

After midnight, a childhood friend who attended an Idiotic Resonances performance lecture in Cincinnati drives you and your collaborator up I-75 to your mother's house in suburban Ohio. She sets the radio dial to 530 AM just for fun. You're talking about everything, anything. You are tired. Then, someone detects something, turns the stereo up. Speaking, not English, and music – garbled but intelligible. You eventually hazard a guess: might be Hindi (or another language of the subcontinent?). It's

possible it's a local transmission – but perhaps the signal bounced off the ionosphere to arrive here?

Figure 9: Composite video from middle section of *Portacular Resonances*

2:56-5:00 // There Are No Clues Here

The eerie agency of the radiophonic electromagnetic field replaces the stability of rigid bodies with thresholds. The radiophonic skips the layers of technical encoding scaffolding modern telecommunications: TCP/IP, Zoom log-in IDs and passcodes, and GPU accelerations. These encodings afford an agential distance.)[71] Radio's compression of distance proposes a different geographical notion of space than network supported telepresence too: graph topologies are made irrelevant by a spatiality better modeled by non-Euclidian manifolds.

[71] Examining the roots of teletherapy, Hannah Zeavin writes that the success of the suicide hotline originating in the 1950s is its ability to cultivate a "balance of presence, distance, intimacy, and control" (2021, p. 2).

Radio creates portals, sutures in spacetime. The recent streaming series *Stranger Things* also explores an affinity between portals, electromagnetism, radiophonics, anxiety, paranoia, and psychosis. The series uses amateur radio as a worldbuilding prop and plot device to situate the drama in the 1980s and allow characters mobile communication, but radio communication's strange geographical vectors rhyme with the characters' travels through portals. These thresholds lead to an "upside down", a truly eerie and weird doppelganger of the Midwest town where the story is set. This alternate dimension affords people the possibility of co-inhabiting and interacting across sutured spaces in the same way as participants telepresence artworks from media artists such as Sherrie Rabinowitz and Kit Galloway. While *Stranger Things*' overt use of Dungeon & Dragons as plot and worldbuilding devices gestures towards its cosmic horror[72], works like the 1980 *Hole In Space* public installation that connected video and audio from street facing windows in Los Angeles and New York elicited ebullient and ecstatic reactions from participants. Rabinowitz and Galloway spoke about the encounters enabled by their work in cosmic and even therapeutic terms.

A return to satanic panic notwithstanding, we find ourselves in a quite different time than the early 1980s of *Stranger Things* and the captivated audiences of Galloway and Rabinowitz. Holes in space, neither terrifying nor joyous, have become the everyday drudgery of pandemic times. Contemporary Silicon Valley giants like Facebook's (also known as Meta's) product Portal put a name to the affordances of telematic connectivity:

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[72] In 1980, TSR inc., the creators of *Dungeons & Dragons* acquired the rights to the Chutulu Mythos from Lovecraft's publisher *Arkham House* and Lovecraft's characters appear in various editions of the franchise.

erase distance, be together. Though we all could share an anecdote of a special moment shared over a Zoom window, it would be inaccurate to call the experience “weird”, neither does it give any “eerie” vibes.

There are no clues here.

[transmission 002: car curious]

you’re curious

you keep driving

where you were going isn’t important

you’re a surfer now

Eventually the light rail drops off, Apache becomes the 88, and the urban environmental assets seem to stop rendering. Through the speakers you hear

your blinkers

your wipers

your accelerator

You and your car are one (or many?) and you are soothed

A passing semi slams on their brakes

the electromagnetic fluctuations erupt through the speakers in your dash

you become anxious (or do you say “you feel anxious”?)

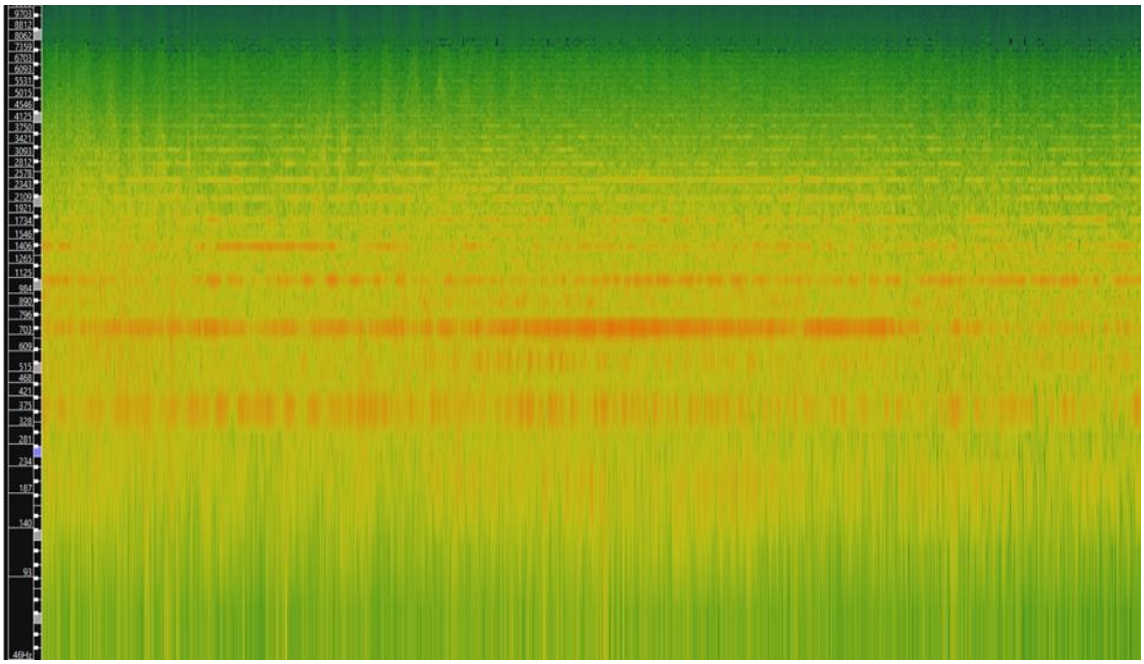
5:00-9:12 // Attunement and Cosmic Enjoyment

Citing the common Latin root *cura* between security and curiosity, Yi-Fu Tuan characterizes anxiety as the dark side of curiosity: “there is always another world beyond whatever space we have encircled, conquered, and made safely our own. To be curious is

to feel anxiety and the need to dissolve that anxiety with further inquisitiveness." (1979, p. 202). Emerging from a becoming-cosmic triggered anxiety in which recoils the subject into a pre-individual and anxious state of blockage, we repeat to ourselves:

"Just because you create a portal doesn't mean you have to step through it."

Figure 10: Spectrograph from *Portacular Resonances* 5:35-6:05



In this section of *Portacular Resonances*, we encounter Phoenix's lightrail system. Even in the absence of railcars, strongly concentrated frequencies arranged in rough harmonic configuration blast through the speakers. Non-periodic squelching, a kind of harmonically vertical spectral smearing interrupts these tones.[73] Driving alongside the lightrail, the sounds seem to pull into an alien attunement already ongoing,

[73] I remind the reader here again that these recordings were taken directly from the line out of the car stereo and underwent no post-processing of any kind. These descriptions are visible in the close-up spectrograph in figure 6.

to tap into vectorality that escapes linearity. Despite the single dimensionality of the Phoenix lightrail system as a transport modality, here we find ourselves surfing on instead of chained to the path's directionality. Take a u-turn, go the other way, dwell at a stoplight a bit too long.

Squelching intensifies as we reach the terminus of the lightrail network. Are these the sounds the results of physical fluctuations of the power lines along the entirety of its run? Are we hearing the additive sum of the rail cars' movements throughout the city? Anxiety dissipates as we begin to feel connected and collectivized as if in the crowd at a noise show. We share an intersubjectivity with a non-human transportation infrastructure, with a collective of unknown depths and expanse.

Conclusion

This chapter fashioned a machine for fighting anxiety from diagrammatic media that 1) finds pathways through diverse kinds of writing (media, film, TV, philosophy, psychology) in order to construct a depersonalizing account of cosmic anxiety, 2) creates the enjoyable inhabitation of a (painful) interiority and 3) anticipates a "precarious consciousness raising" collectivity yet to come.

In constructing an account of cosmic anxiety, I have experimented with the expressivity of various techniques including analog radiophony, videographic composition, and media installation, as well as how that work showed up textual format. These experimentations were sometimes intricately linked to the kaleidoscopic embrace of Lacan's four discourses, which I used as a conceptual frame. The right-aligned second-person imperatives evoke a dungeon master. The frenetic radiophonic noodling waxes

hysteric, while the radio receiver itself—a conduit silent without the electromagnetic field—channels and creates the conditions for an attunement in the analytic mode to the hysteric symptom. The academic voice has filled in gaps the other three would have left embarrassingly bare.

This diagram also strings together the ontogenetic thought of Simondon and the conservative psychoanalytic thought of Lacan. I have not squared off the two. Although Simondon draws on psychoanalytic literature (including Jung's mobilization of individuation as a clinical concept), a gulf remains between his thought and the Lacan. Whereas psychoanalysis devotes considerable weight to the psychic and subjective faults and lacunae, Simondon's ontogenetic account of the psyche might be described (or dismissed) in contrast as a psychological organicism. What is more, their aims are incomparable: Simondon is concerned with how and why an individual comes into being and how the process continues, while Lacan's clinical project focuses on how artifacts of that individuation work (Bryant, 2006).

Just as I am not interested in arbitrating between the two, this chapter does not shore up their inconsistency or installing a permanent bridge across the schism. The temporary bridge I have constructed will collapse as it succumbs to the passage of time and elements, or under too much weight. The diagram of cosmic anxiety vacillates between both weak and strong theory (Thompkins in Sedgwick, 1997), just as anxiety and its resolution crossfades between the paranoid urge to close the circle and the reparative acceptance of our irreconsilable (Sedgwick, 1997). Built in hysterics, the Simondon-Lacan bridge is weak. But the strength of such bridges are that they work to

bend together two discrete circuits into a continuous machine for thinking. In this case, the bridge has short-circuited other parts of the Simondon-circuit and Lacan-circuit that others will animate in another metamodelizing machine for thinking-feeling chaosmos between precarity-alientation and collective becoming. There are still more anxieties in our contemporary mental ecology to be identified, encountered, and experienced. In other words, this chapter's aspiration towards a larger project of building machines to fight anxiety is not primarily infrastructural and technical, but cartographic and diagrammatic.

The diagram is also sinthomatic. The sinthome, a co-production between the subject and symptom, arises as an ecstatic creative exchange with the symptom (Lacan's example is James Joyce) after the symptom is integrated into the person's identity. In the case of anxiety, we find the beginnings of such integration in identity statements such as the IPC's "we are all very anxious" (i.e. we = anxious). If we follow psychoanalysis's aspiration to dissolve everything but the symptom (Oyer), a machine for fighting anxiety does not target anxiety itself, or the conditions of anxiety, but creates the subject's own conditions for them to "enjoy your symptom" (as Zizek would say).

If this chapter has set out to play the Lacanian discourses like a modular synthesizer, we might ask who is listening, how it sounds in the room. If the four discourses pinpoint the moment of phase change called subjection/subjectivization in the mental ecology, their installation in relation to radiophonic and research-creation media systems is also to speculate on decodings and transductions at the boundary of mental ecologies, media ecologies, and by extension, social ecologies. As a pathbuilding project, the diagram of cosmic anxiety is always already a collectivist project:

> Paths are collective in their very nature. When you are hiking alone in the wilderness, if you are on a path, you are connected to other people. It is in this sense that there is no such thing as wilderness, or frontiers for that matter […] If you find a path, you are making a collective. You are a collective in the making. The pathfinder is neither a rugged individualist nor a member of an established group. Pathfinding is collectivity in the making (Lamarre, 2021, p. 7).

Considering pathfinding as collectivity in the making, then this diagrammatic field report already prototypes a machine for fighting anxiety. Simondon writes that "anxiety is diametrically opposed to the movement by which one takes refuge in one's individuality; in anxiety, the subject would like to resolve itself without going through the collective" (2020, p. 283). This chapter, as well as the artwork it follows, begins with the anxious, alien(ated) encounter with potential rhizomatic entanglement, but carries through to the end but hopping a path well-trodden but heretofore unrecognized as a (more-than-human) collectivity.

This chapter lays groundwork for further diagrammatic, sinthomatic, and cartographic engagements with contemporary forms of anxiety, their media technical dimensions, as well as prototyping of intervening machines for fighting anxiety.

CHAPTER 4

SLOMOCO: ORGANIZATIONS, MACHINES, AND EVENTS

In this chapter, I begin by motivating the SloMoCo project by considering the political economic and entrepreneurial-disciplinarian conditions of art-research in the United States. I argue the historical moment of the Coronavirus pandemic and its relationship to the psyche marks the potential for catalyzing different modes of drawing attention to and organizing around this problem. Experiments in conferencing such as "unconferences" and contemporary political organizations such as Occupy Wall Street provide a broader social context and put this work in relationship with cybernetic ontologies. I convoke Isabelle Stenger's call for a "slow science" to elaborate notion of slowness beyond prolonged duration and explicate its political, disciplinary, and aesthetic-experiential consequences.

I describe SloMoCo's organization, including its technical platforms, schedule, labor distributions, public and private events and structures.

I share a design research project called "Actualizing Embedded Potentials" in which I worked with twelve SloMoCo participants after the event's completion. The hour-long one-on-one sessions were designed to ferret out outcomes of participation in the event that weren't anticipated in advance. The study itself sets up its own creative enabling constraints to set the stakes of the encounter through a custom and experimental creative interview protocol. I share the data set gathered from the study and employ a processual hermeneutic to highlight outcomes of the study (and by extension SloMoCo) that grant insight into the impact of the event's speculative infrastructural engineering.

In my conclusion, I point to to questions raised by the work not limited to a narrow area such as “the future of the conference”. More broadly, it gestures towards new para-disciplinary practices of knowledge production and worldmaking as well as new forms of collaborative and cooperative organization sufficient to arts-research in the 21st century.

Re-Tooling Organizations

SloMoCo and Enabling Constraints

Developed in place of the 2021 MOCO (movement and computing) scholarly international conference, SloMoCo was a series of events that ran from March through December 2021. According to the community’s website: “MOCO is the International Conference on Movement and Computing. MOCO aims to gather academics and practitioners interested in the computational study, modeling, representation, segmentation, recognition, classification, or generation of movement information. MOCO is positioned within emerging interdisciplinary domains between art & science.” Furnished with more than fifty artist-scholar submitted works, the phases consisted of presentations, workshops, performances, seminars, micro-residency programming, collectively composed artwork, tutorials, and other experimental formats.

I began developing SloMoCo as a design research project intended to generate new techniques about a unquestioned structure of academic knowledge production: the conference. Taking the conference as a laboratory for understanding interdisciplinary practice and knowledge production, SloMoCo expands and contracts the conference by way of its infrastructures. Peer-review was substituted by committee curation and there

was no cost of participation. These infrastructures, determined against design criteria, enact “enabling constraints”, a term developed by Brian Massumi and Erin Manning to describe their own art-academic experiments. Massumi writes:

> Without constraints there are no stakes. Our point of departure is what we call "enabling constraints"— sets of designed constraints that are meant to create specific conditions for creative interaction where something is set to happen, but there is no preconceived notion of exactly what the outcome will be or should be. No deliverable. All process. (Massumi, 2008)

Speed, or rather intensity, constrained SloMoCo. If the weekend conference runs on a manic energy, then it made no sense in a pandemic lockdown. The caffeine-fortified manic energy of the co-present conference seemingly evaporated, the Zoom conference demands the same stamina we have for all our meetings: Ignore the fatigue of prolonged sedentary activity and screen-bound social performance just long enough to avoid betraying what everyone knows: we are all exhausted. Virtual backgrounds and mute buttons are band aids on the fissure that’s erupted and elided public and private.

Some groups maintained an on-line conference which enabled other modes of participating. Ride a bike with a keynote in your ear, take in a roundtable on a beach, fold laundry while the titans of your field battle it out in the Q & A. Now that lockdown has loosened, so-called hybrid conferences are back to the discontent of everyone except IT departments raking in cash in tech support. In considering a possible ersatz event for the 2021 MOCO conference, I answered a call for new rhythms at a slower pace.

Instead of one weekend, this slow event unfolded over nine months. This duration afforded different modes of engagement, the temporally diffuse SloMoCo event afforded an assortment of atypical nature: prolonged and recursive community-wide meta-research questions, sociocultural and political contexts of research. A slower timetable provides

opportunities for iterative collaboration and asynchronous study as well as periodic peripheral engagement, learning and teaching.

Portals, Pandemics, and Psyche

The Covid-19 pandemic brought global travel to a halt, conveniently proceeding the repercussions of the climate crisis and triaging the necessity of post-carbon social formations. Like all aspects of society, the university has only begun to rock from turbulence in the wake of the global Covid-19 pandemic. As members of this adventurous scholarly community, we face an unclear future. Novelist and activist Arundhati Roy has called the pandemic a portal that our world will step through (Roy, 2020). She asks: what will we leave behind? And what do we want to build on the other side?

Academic conferences provide opportunities for intensive sharing, experiential learning, and critical discussion. They also aim to foster intellectual growth and camaraderie building. For many, conferences serve as a shot of energy and inspiration to bring back to the lab. In effect, the pre-Covid conference was a "working" vacation: a retreat and a deep dive: a third space that was not the lab and was not home. Video conferences struggle to replicate facets of these events: namely sociality. How to approach the design of an experiential, engaged, and enacted event for community stakeholders senior, junior, and yet to join?

The intensity of the co-present event and the physical and mental stamina it demands of attendees, presenters, and organizers is not easily transposed to synchronous, telematic gatherings. Our private home economy interjects itself into our social and working lives, clamoring for immediate attention, disrupting the professionalized visage

we curate for our zoom call: dogs barking and muddling the audio algorithm, an exercising roommate rippling through the virtual background.

Virtual backgrounds and mute buttons are Band-Aids on the fissure that's erupted and elided public and private (see Coccia, 2020). The research question I ask is: how can we design an event that treats virtual and telematic engagement as a feature and not a bug? What does this third space look like? With its penchant for observing and prototyping embodied experience, technical know-how, know-what, know-when (see Gill, 2015; Polanyi, 1966), MOCO is uniquely situated to respond playfully to this speculative invitation. With its penchant for observing and prototyping embodied experience, technical know-how, know-what, know-when, the MOCO community demonstrates a unique situation to respond playfully to a speculative invitation. For the last seven years, MOCO has convened research-practitioners with diverse metier in dance, somatic practice, theory, education and learning science, HCI, engineering, design, and neuroscience to share insights, findings, and provocations at the intersection of movement and computing. With provocations and para-events around topics in uncomputability and computational capture, many in the MOCO community wish to maintain a generative tension and complexity between the moving body as experienced and as represented.

SloMoCo returned to these tensions once more with a difference to ask how these insights can inform the experimental presentation and performance of artist and scholarly work. How can this attention to representation and abstraction of movement play a role in telematic, collaborative, and relational artistic practice? How can attunement to

embodiment and facility with real-time movement analysis generate new modes of engagement?

Organizations as Machines

This chapter's combination of analytic and a practical eye in an organizational context may be understood as what Guattari called institutional analysis. Guattari's philosophical interest and what might be called creative practice in institutions and organizations is guided by his theory of machines. Indeed the concept of the machinic is helpful to understand Guattari's conception of institutional analysis. Gerald Raunig explicates "machine thinking" historically:

> As early as the 19th century, a machinic thinking emerged which actualized the concatenation of technical apparatuses with social assemblages and with the intellect as a collective capacity, and recognizes revolutionary aspects in this. […] To the extend that it is not limited to the designation of technical apparatuses, the concept of the machine no longer refers only to a metaphor of the mechanic function of something other than technical machines. Although these kinds of ideas still remain dominant, they are being increasingly supplanted by a thinking that grasps the technical machine conversely as an indication of a more general notion of the machine behind it. […] In Félix Guattari's writings, especially what he wrote in the 1970s together with Gilles Deleuze, thsi movement is expanded and condensed: the technical machine is declared a subset of a more comprehensive machinic issue and terminology, which is opened up to the outside and to its machinic environment and maintains all kinds of relationships to social components and subjectivities (2010, pp. 26–27)

For Guattari, the technical or mechanical machine is a concretized and extensive kind of machine. These concrete machines, like a car driving down a highway, involve nay appropriate the surrounding environment into a flow—the car takes up the road's fricative asphalt, its curves, inclines, as well as the energy embedded in the earth's petrol. The car radio, beaming in "Barracuda" by Heart from a satellite radio provider, the radio converts the digital signal to analog, the car battery powers the speakers which vibrate the

air, exciting the driver, who, envisioning himself as a movie protagonist, imparts psychical flows of desire through the body to the gas pedal. Machinic flows between seemingly disparate elements operates through transduction: “a process whereby a disparity or a difference is topologically and temporally restructured across some interface. It mediates different organizations of energy” (McKenzie, 2002, p. 26).

As Raunig points out, the machinic dissolves the human / machine binary; the human is always already machinic.[74] Following Guattari, he opposes the machinic to the dominant idea of structure and the determinism (as in media determinism, McLuhan’s equation that the medium is the message or Wiener’s stronger original statement that the organization is the message) that accompanies it. Abstract machines conjugate concepts, thoughts, affects, and precepts, and enable the instantiation of concrete machines. Social organization broadly is a diverse set of abstract machines. An abstract machine may enable and interface with legalistic technologies of property, ScrumMaster-run morning stands, or decentralized autonomous organizations. In the text *A Thousand Machines*, Raunig goes on to describe in machinic terms social organizations such as theatres, autonomist political activities, factories, and so on.

Raunig also reminds us of Deleuze and Guattari’s ambivalence about the machine. Like many of their concepts, they refuse being singularly taken up as if pages of a manual. This stresses the need for doing what they call micropolitics: if politics is the

[74] Though more can certainly be said about the distinctions between these various traditions: Machinic thought is no doubt at work in what is called systems theory, complexity theory, second order cybernetics, and such movements no doubt influenced Guattari’s conception of the machinic.

machinic assemblage of power on the level of societies, micropolitics is a machinic assemblage of power at a micro societal unit.

The persistence and mutation of abstract machines of capitalistic exploitation explains the transition from the disciplinary factory to the entrepreneurial office. The office, supposedly a site of a new kind of work to be done by the new "middle" class who are liberated from drudgery by computational automation, leverages new concrete affordance to take hold in a different, at first unrecognizable way.[75] In this manner we can understand the messy transition from enclosures of the factory, prison, and hospital characterized by the disciplinary society, to the open-floor plan office of the control society. In a Foucauldian way, the control society builds on top of the disciplinary one, or that the abstract machine disciplinary machine conjoins with a cybernetic one. To repeat *The Three Ecologies's* question*:* How then do we regain control?

Relays as Organizers

In the "Postscripts on Societies of Control", Gilles Deleuze takes stock of capital's appropriation of cybernetic machines, both political and technical, in the latter half of the 20th century (1992). He calls into question the ability of union—a form of organization endemic to the factory and the disciplinary society— to resist these emerging forms of control and subjugation. By no means should we discount the potential of worker union structures to create the conditions to produce difference in thinking, speaking, acting, and feeling, especially considering Deleuze's specific 20th

[75] See (Braverman 1955). I am thankful to Pierre Schwarz for making me aware of this early socialist reading of cybernetics, automation, and its effects on work.

century European context in which unions were practically embedded as part of the state apparatus.[76]

With that said, asymmetrical modes of organization propagated in response to capital's changing organization. Barthold et al (2018) investigate the Occupy Wall Street events and communities as a resistance to globalized financialization—an abstract machine particular to control society to which union structures cannot sufficiently respond. Drawing on work by Stengers and Pignarre, Deleuze, Guattari, and Foucault, they articulate a mode itinerant of nomadic politics that draws out organizational tendencies in contemporary politics that disrupt hierarchies by embracing a model of lateral relays between nodes (Barthold et al., 2018, pp. 11–12). The itinerant politics of Occupy provides an instructive, radical examples of abstract and concrete machines which resist macropolitics in favor of a relaying micropolitics.

The relay as a touchstone brings us back to transductive abstract and concrete machines. This provides a model for us not only of the micropolitics of a particular organizational structure, but how we can such a structure might map onto a mode of doing science in which potentials are laterally embedded between participants. We find relays at work in both *A Thousand Plateaus* as well as in the antecedent philosopher of technics Simondon *On the Mode of Existence of Technical Objects*. Relays function as one might expect a switch to operate, but instead of interrupting a current as in an on/off switch, relays redirect the flow current. There are several types of relays, but in this case,

[76] I am grateful to Brian Holmes for making me aware of this historical situation.

we can understand this as a switch which may be thrown to direct electrical current between one pathway or another. Simondon discusses relays as an interplay between man, machine, and world:

> this machine-man relation is realized when man applies his action to the natural world through the machine; the machine is then a vehicle for action and information, in a relation with three terms: man, machine, and world, the machine being that which is between man and world […] The machine thus essentially serves the purpose of a relay, an amplifier of movements, but it is still man who preserves within himself the center of this complex technical individual that is the reality constituted by man and machine. (2016, pp. 78–79)

While Marx, Raunig, Deleuze, Guattari, and the discussion above object to the claim that humans are always centered in "complex technical individuals", for Simondon, a relay transmits "action and information" between man-machine-world. While resembling machinic thought, this is not as fully adventurous as Guattari or other parts of Simondon. The relay is the machine and the machine envelopes man and acts upon the world and the environment. As "movement amplifier", this reads a McLuhanist account of machines as prosthesis.[77] But we have described more social machines already. In *a Thousand Plateaus* the Simondon's relay finds a more immanent potency:

> Such is the form of exteriority [...] A thought grappling with exterior forces instead of being gathered up in an interior form, operating by relays instead of forming an image; an event-thought, a haecceity, instead of a subject-thought, a problem-thought instead of an essence-thought or theorem; a thought that appeals to a people instead of taking itself for a government ministry. (Deleuze & Guattari, 1987, p. 378)

Here the subject of thought gets us closer to an account of a machinic ensemble not just

[77] I touch on a more expansive Simondian conception of machinic organizations in the dissertation's conclusion.

for political itinerancy but for collective thinking, making, and feeling. Thought as classically possessed by an impenetrable interior is turned outwards. Exteriorized thought triggers arrays of relays that re-route its escape. Its movement refuses coalescence and finds itself in many ways and many places at once. The thought-machine evades capture, instead, relaying its energies to set other machines into motion: as a problem-thought cracking open old thought machines to cannibalize their components to be taken up anew.

(It is in this sense that SloMoCo is literally movement computing, an observation this chapter will continue to expand upon).

Despite the apparent conflict between an organization with a name and this machinic thought that subverts organization itself, these things can co-exist: an organization can allow itself to be disassembled and re-assemblaged according to new diagrams, and in fact it may be necessary to meaningfully think and enact the problematics of ethics and equity that drive these concerns. This is what Guattari meant by institutional analysis: whatever the institution, union, conference, school, university, corporation, academic community, political body without organs or organs without a body, the capacity for transformation is preserved in so far as forces (organizers, architectures, software systems) fight for the resources to power these relays than enable exteriorized thought to resist capture and essentialization.

Slowness, The Event, and Institutional Idiocy

SloMoCo centers the gathering event itself. The event is more than a Facebook category—events are happening all the time on non-human scales of perception and action. Eugene Young characterizes the event for Deleuze as a feeling "that something is

happening: but the paradox is that, one the one hand, an event can only really be grasped in hindsight (or with foresight), and, on the other hand, we *do* presume that we can refer to incidents, changes, or actions (whether novel or not), that are *currently* unfolding" (2013, p. 116). As such SloMoCo lets go of any notion that we plan the event ahead of time – instead we may think of the activity of organization or artistic composition as techniques for staging.

Like the cosmopolitical convocation whose "efficacy is rather to catalyze a regime of thought and feeling that bestows the power to become a cause for thinking, on that around which there is gathering" (Stengers, 2005, p. 1003), SloMoCo aspires to create a shifting ground on which a participant can land among new collaborators. It is an invitation to think, act, compute, and move in a transient collectivity, and then to depart with transformed "knowledge, hopes, fears and memories, and allows the whole to generate what each one would have been unable to produce separately" (Stengers, 2005, p. 1003).

Another figure in the cosmopolitics is the idiot (Nocek, 2017; Stengers, 2005). Exemplified best by Melville's Bartleby, the idiot is always saying they "prefer not to", escaping the binary of transgressive insubordination and servile compliance. That escape causes the system of thought to seize, effecting a slow-down. To create slow-down like Stengers calls for in the *Manifesto for Slow Science* (2018) in an art-science community challenges the institutional touchstones of a performative scientism many computational media art communities have embraced in recent years. In reaction to an increasingly quantified knowledge-production economy wherein artistic inquiry must make its

'research outputs' metrically legible, these adoptions include a parliamentary judgment of knowledge via double-blind peer-review (which both assumes what constitutes a contribution ahead of time and pre-defines dissent so to bound discussion & inquiry)[78]).

SloMoCo

Framing a More-Than-Conference as Design Research

As mentioned in the introduction, this chapter engages with two related works: SloMoCo as a organized series of public events, and a design research process with SloMoCo participants. Here I share context from learning sciences, computer science, as well as design research for both organizing and analyzing or theorizing conferences as sites of subjective and knowing production. It details the limitations of the conference identified in these divergent contexts.

First, I will share experiments from education and computer science in conferencing differently and designing different conferences. Then I will describe design research: both its interdisciplinary applications and contemporary research-practice that leverages the applied nature of design towards articulating more equitable futures. In both sections, I will identify how each field's literature backgrounds my work, the gaps my work will fill, and the literatures' connection to my research questions.

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[78] From a different kind of work: "consensus-based decision making has been experimented with for many decades among alternative political and social movements and has been resurgent in recent years in the assembly-based movements coming out of the Arab Spring and Occupy. Conceived as a form of direct democracy, often under the anarchist banner, in practice it easily leads to paralysis: the despotism of the most cantankerous or the least adventurous. Since an individual (or in "consensus-seeking high majority rule" models, a small minority) can block any action, it usually leads not to anarchic adventure and effervescence, but to least-common-denominator ennui" (Massumi, 2018).

The academic conference needs an update and for better or for worse the pandemic has given it. There are concerns for conferences in interdisciplinary scholarly communities borne out both in methodology and economics. STEM researchers enjoy vast resources in comparison to the arts and humanities, creating financial imbalances between researchers (Hayes & Marquez-Borbon, 2020). These economic validations also motivate interdisciplinary communities to normalize STEM methods and modes of inquiry to the exclusion of others.

Apart from method, academic conferences mostly ask participants to shoulder financial burdens (again, unless they are in a field where funding or lab support is possible), maintain bizarre and exclusionary rituals, and make little effort to accommodate the complexities of family life.

As more academic and artistic communities assess the carbon footprints of their gathering and switch to online, hub, or hybrid models, SloMoCo is a model for communities looking for environmentally and socially sustainable alternatives, or, better yet, inspired organizers looking to use the privilege of gathering as a creative endeavor of its own. Considering alternatives to traditional in-person meetings enables scholarly communities to explore how they serve the field by broadening its accessibility and investing in pedagogical initiatives for new scholars.

In learning science, researchers have assessed how academic conferences increasing commoditization creates expectations and formalities that do not always best serve the researcher and her research (Benozzo, 2021; Osgood et al., 2020). These scholars have also identified various modes of conferencing – unsanctioned ways of

attending conferences which nevertheless creates value and insight.

As well, there have also been design interventions exploring alternative conference designs. One notable example is "the unconference" (Boule, 2011) based on Harrison Owen's 1985 concept of Open Space Technologies (2008).[79] The unconference aims to shift the organization of time and social energy away from bundles of time for individual research towards structures allowing participants to collectively build interests during the event. Unconferences were picked up by computer science and have since spread to education (Carpenter & Linton, 2018), the digital arts (*NIME 2017 Unconference*, 2017)and humanities (Smulyan, 2020). Outside the unconference, there has been little documented experimentation with the forms of gathering and knowledge sharing in academic communities. This chapter will add to this documentation of an alternative conference, building on and departing from the unconference in important ways (e.g. speed and duration).

The SloMoCo project and its subsequent study can be understood as design research (Camburn et al., 2017; Edelson, 2002; Papalambros, 2015), which pairs creative making techniques with an inquiring method and interpretive framework. Cobb et al. describes the design research process as beginning with a theory around which design principles are created (2001). These principles inform concrete decisions in the design process. Finally, there is an interpretative assessment of how the design engaged with the theory. Researchers in many disciplines have found design research useful, including

[79] The name suggests both the liberating and cautionary accounts of smooth space from the previous section.

learning science (Cobb et al., 2001; Nordstrom, 2020), organizational theory (Clegg et al., 2017), and therapeutics (Reich, 2017). In these contexts, design practices advanced understanding by incorporating new methods.

Interdisciplinary design researchers also leverage design's ability to have a direct impact on the communities in their studies through organizational, curricular, and systems design. Historically, design (alongside architecture) has harbored a contingent exploring how their craft can create a more equitable world. In recent years, researchers have used design to intervene in complex socioeconomic situations while generating alternatives to the status quo. Such situations include: coloniality and sustainability (Escobar, 2018); climate change and geopolitics (Fry & Nocek, 2020); and even our collective inability to imagine alternative futures (Dunne & Raby, 2013).

Designing SloMoCo

In the Summer of 2020, I was invited by the Movement and Computing steering committee to convene an ersatz event for the canceled international conference. During my PhD I had expended considerable energy organizing conference events, such as PHuN (the post-human network), which I found to be fertile sites for doing the kind of radically transdisciplinary study I found so fascinating. I had not yet found a way to frame this work as something inquiring beyond the mere professional category of service to the field. I began to devise an event I could intentionally frame in this way.

My theory was that the conference needed rethinking to better serve artists and researchers in a time when our lives were complexified by the collision of public and private. At the same time, the global slowdown opened portals to new ways of doing and

being. I also theorized that design innovations in conferencing could invite both new interlocutors and new forms of research into this unique interdisciplinary community.

This theory informed SloMoCo's social and technical design principles: 1. lean into the rhythms of quarantine life to hold space for slow learning and slow scholarship 2. encourage iteration afforded by duration and feedback afforded by community 3. leverage online spaces and social technology to make the movement and computing techniques and knowledge production accessible to people previously excluded due to travel and cost of attendance. These design principles influenced concrete elements of SloMoCo which I describe in the following section.

Infrastructural Description

This section further describes the enabling constraints of SloMoCo. I encourage readers to explore the links provided under the "Digital Spaces" subheading which will give a much clearer picture of the work that was shared and created during SloMoCo through these enabling constraints. I begin by giving a broad overview of the events and modes of participation. Second, I highlight the unique way in which SloMoCo's digital spaces create a uniquely dynamic conference proceedings.

Event Typology. SloMoCo ran three phases: Spring, Summer, and Fall which mapped onto the seasons of the year 2021 respectively. As a result, the event lasted between nine and ten months. Each phase contained a discrete call for proposals that populated the various streams (microresidency, presentations / practice works, and provocations) with people, events, and themes.

SloMoCo hosted a total of over fifty groups and individuals of artists and

researchers. In the Spring, we were joined by twenty-five projects, nineteen in the Summer, and twelve in the Fall. Some microresidencies extended their work into a second phase.

We hosted public events at three to four-week intervals to develop an iterative reportage. The events have taken place on zoom to accommodate a community scattered around the planet. They are comprised of ready-to-go submitted works, microresidency proposals for extended research and work development, or seminars conceived by committee members and community.

The SloMoCommittee, a small group of volunteers that shrank and expanded over the nine months, chose participants from submissions based on two criteria: 1) their proposals's relevance to the movement and computing space and 2) their willingness and enthusiasm to engage the eccentricities of the SloMoCo project. Interestingly, informal surveys completed with project applications suggested that only about 1/third of applicants had been involved with the MOCO community before.

There was no fee for participation and no business model.

Microresidencies. About two-thirds of submissions were microresidency proposals, indicating applicants desire for embedded artistic community. Microresidents met for an hour every week with a cohort of 3-5 other microresident projects. Each cohort collaborates with a counselor, a SloMoCommittee member who facilitated discussions and intermediates between the microresidents and the SloMoCommittee (communicating needs, wants, issues, etc.). Microresidents were under no obligation to show completed work but did present their proposal at a public event. They were encouraged to use the

cohort time for user testing, work-in-progress showings, critique, or discussion. In the Spring, the microresidency culminated in a group exhibition at a public art show in Phoenix. In the Summer, microresidents showcased their work in a 90-min critique session. By Fall, microresidency cohorts had developed a dynamic autonomy and organized their own showing inside a virtual environment created by a microresidency project.

Provocations Track. SloMoCo also hosted a track of vibrant provocations run by Jessica Rajko, Teoma Naccarato, and John MacCallum that spanned all three phases. This provocations track built on the history of auxiliary events at MOCO that provoke or intervene in generatively fricative ways. At MOCO 2017 at Goldsmiths, London featured an unconference-like event called UNCOMO (uncomputatable movement) organized by Adam Russell and Joel Fletcher. UNCOMO inspired subsequent events called Provocations at MOCO 2018 and 2019. Naccarato and MacCallum organized the event in 2018 and were joined by Rajko in 2019. In these provocations events, provocations organizers posed provocative question so to solicit counter-provocations ("What escapes computation in interactive media art?" and "What aspects of your practice are invisible to your collaborators?"). The provocations organizers published the responses they received on a dedicated website (https://www.provocations.online/). At the conference event, select provocateurs were put in conversation with each other in single session.

SloMoCo provided continuity to the Provocations project, which developed its own track spanning all three phases. In each, they revisit, remediate, resituate the 2018 and 2019 Provocations in a video series showcasing conversations between previous

years' provocations submitters alongside new entrants. In the Fall, a new provocation was proposed that riffed through the two phases of SloMoCo provocations. Through the pairings of video conversations (available on the SloMoCo Manifold) and prompts to SloMoCo participants on the Discord server, organizers display an advanced and idiosyncratic mode of facilitating.

Special Events. Although all phases featured microresidencies and practice work presentations, Spring, Summer, and Fall made distinct offerings in response to participant's needs and other opportunities. In the Spring, nine microresidents participated in co-creating a multichannel projection mapped installation at a car park on a university campus in Arizona. In the Summer we planned three seminars to accompany each public event. The seminars included invited guests, readings and a thematic or problematic which grounded both discussion and the presentations of practice work and microresidency presenters. In the Fall, we repeated these seminars as three Art lounges (a panel, a set of performance, a collection of workshops) at an interdisciplinary conference.

Digital Spaces. Since participants lived in different parts of the world undergoing various phases of lockdown in response to the ongoing pandemic, SloMoCo made use of various kinds of social media technologies to enable gathering. In typical pandemic style, Zoom was an important infrastructural component for synchronous participation in additional to custom gathering spaces developed by artist participants. I want to draw attention to the use of asynchronous technologies as a mode of generating processual conference proceedings. To a varying degree, these digital spaces function as traces of the movement of thought across participation.

Some digital spaces catalogue or archive the conference activity in a conventional manner. SloMoCo organizer Madoka Clark created and maintained a public facing website which exhibits participants work in a playful way (https://moco21.movementcomputing.org/). The instagram page (@slo.moco) showcases the graphical design language from Will Hallett as well as posts directly from artists who volunteered to "take over" the page for a brief period of time.

Other media catalyzed more iterative and participatory modes of engagement. Manifold Publishing and Discord allowed me to weave interactive feedback loops into participants' publication processes and create the possibility for asynchronous participation. Manifold is a dynamic publishing interface hosted by a remote server. The SloMoCo Manifold instance is reachable at www.slomoco.surf. Participants have read and write access to a page that can contain readings, media files, and so on which allow for a multimodal elaboration and documentation of their projects. Social features allow people to make comments, highlights and other engagements with the text. Although

many SloMoCo participants used Manifold in a barebones fashioned (and the technological barrier to entry may have discouraged others from making pages at all), some appropriated the site to thoroughly expressive ends See for instance “Time Clocks” by Allison Costa, the “Community Game Toolkit” by Dan Lichtman, “Sign Stealing” by Megan Young, “You, Me, and My Computer” by Lisa Jamhoury, and Provocations Page.

Finally the Discord page, which is inaccessible publicly, serves as a record for participants of ongoing conversations. Some participants appropriated channels to document their research process. The Provocations stream shared provocations they solicited from interlocutors to spur conversation and dialog around conversations at the nexus of movement and computing.

Actualizing Embedded Potentials

One participant told me they appreciated SloMoCo because it produced more SloMoCos: more interventions, provocations, and spaces for thoughtful reflection. We may borrow a more evocative phrasing from Erin Manning and Brian Massumi speaking about an event they co-created: “the focus in the creation of techniques of relation was on catalyzing a continuing collective culture dedicated to an ethics of engagement. We wanted to set into motion something that could grow and take us with it. In short, the event would be evaluated according to it seeded rather than what it harvested” (Manning & Massumi, 2014, p. 92).

What is the difference which makes a difference? How does SloMoCo seed further events and relay thought into motion? The temporal constraints of my graduate program do not permit for a longitudinal study, wherein we may see how experiences at

SloMoCo become diffracted by other art-research events. The nine-month long duration of SloMoCo built itself a long runway already, but SloMoCo's conclusion left still more questions: how has the broader, collective SloMoCo event created new potentials for individual researchers? How have speed, duration, intensity, and iteration shaped the formation of those potentials? And how can we capture these potentials to assess the design intervention? More than time is lost if we wait two years for things to play out before asking participants. How can we speculate on this design intervention's future impact?

This research intervention described in these sections revolves around these questions, beginning with another theory: given that potentials have been seeded for participants by SloMoCo, the right social and expressive technologies could serve as a sandbox environment for accelerating the actualization of some of these potentials. This claim informed the design of a one-hour creative interview which engaged ten artist researchers who were involved with SloMoCo.

This mode of evaluation augments the data corpus already gathered for this project. Borrowing from qualitative research methodology (Kvale & Brinkmann, 2009), from the MOCO provocations practice (*MOCO Provocations*, 2018), generative performative techniques such as those found in Fluxus's text scores (Harren, 2020), and Guattarian schizoanalysis, I composed a protocol that will ask an interviewee to revisit and narrate aspects of their SloMoCo participation through the creation of tangible props.

In the one-hour interview facilitating by Zoom, the interviewee will share and narrativize these objects, providing an agenda for the time but not overdetermining what

other conversations may unfold. They also made connections to other projects presented at SloMoCo. In the process, they generated sets of objects that they used to propose a new project. Participants' "thinking out loud" narrativization provided data that helps articulate new techniques for academic gathering and knowledge production, a handbook for new ways of conferencing.

Protocol

First, I will describe the experiment's procedures. In the following I will motivate and justify the materials used for this study.

I wrote following one-hour procedure to enact with a single interviewee. Throughout the procedure, data were collected by the interviewee and me in the form photos of the props and a video recording of the interview itself. The interviews took place over Zoom, which generated a transcript. No other data was collected outside of this interview.

1. **Prep (2 mins)** The participant is asked to gather constructive and expressive materials at their Zoom location (desk, couch, kitchen table, etc.). They may interpret constructive and expressive how they like; the interviewer will elaborate if asked. These could be a set of everyday objects, or traditional craft materials (markers, paper, scissors, tape). The participant is asked to photograph or film each stage and so a camera or smartphone is required.
2. **Prop Set 1 (10 mins)**

1. The participant is asked to make a simple marker for the project they presented or workshopped at SloMoCo. They are asked to speak about their work and why it is

important to them, while they go creating props from their materials to tell the story (if the participant forgets to create props as they speak, they are reminded).

2. As they go, participants are asked to identify the people, places, tools, processes, objects, moments, and concepts in the props they created.

3. **Prop Set 2 (10 mins)** Participant repeats Step 2 with a *different* project presented at SloMoCo. They select this project from their own recollection. If they are unable to recall one, they are referred to the SloMoCo website.

4. **Connective Props (5 mins)**

1. The participant is asked to create a new set of physical props that connect the two projects in some way that makes sense to them. This may be a connection made because of their own life experience, conceptually, technically. As before, they are asked to narrativize or "thinking-aloud" it as they go.
2. The participant is asked to identify the people, places, tools, processes, objects, moments, and concepts in the props they created.

5. **Synthesis Set-up (5 mins)**

1. The participant is asked to remove project markers and to group their props in a pool.
2. They are asked to create a set of props from a list of prop names. This set of prop names will be taken from the previous interview as produced in **Step 7.** These should be pooled with the prop sets 1 and 2.

6. **Synthesis (10 mins)** They are asked to formulate a research question that would seed a new work or research stream using the prop pool, thinking it aloud as they

go. Participants are advised that they are under no obligation to bring these research questions or new works into fruition. They may also create new props at this time.

7. **Passing on (5 mins)** The participant is then told who the next interviewee is. They will choose six props to pass on to them: three props they used in step 6 and three they did not. The participant will be aware that these props will be used in step 5-6 for the next participant.
8. **Data submission (3 mins)** The participant will submit their photographs via email to interviewer,

Materials

I used Zoom to conduct the interview. Although Zoom can limit the degree to which we are able to establish reportage, my sample is composed of international artists and researchers. What is more, SloMoCo was conducted almost entirely on Zoom – a compelling reason for maintaining the medium. Apart from this technology, the other equipment are the materials that the participants brought to the interview.

The justification for the craft materials or household objects are two-fold. First, research in embodied cognition suggests that we think not only through our brains but also our bodies (Clark & Chalmers, 1998; Varela et al., 2017). Cognition arises when the body interfaces with the environment – a stream, a video game, a kitchen. To this end the prioritization of creating and manipulating physical objects in these interviews is to engage the body in the actualization of potentials. By making their own physical manipulables, participants can make their own handholds for ideas, concepts, technologies, etc. A secondary speculation is that when it comes time for participants to

create their own projects, these handholds enable the quick iterating through or rearranging of elements to quickly generate foundations for a novel idea. Apart from being our only option, taking MOCO – a conference about movement, the body, and technology – online during the pandemic provided an opportunity to think through how the body engages the home environment, and what this strange conflation of public and private brought into thinking together. To that end, household objects or everyday objects – the ones we fiddle with or stare at during video calls - seem to be natural conversation partners to speak through this experience.

Results

I worked with ten participants using the protocol, collecting over 12 hours of footage and almost two hundred images. The machine-produced transcripts augmented the already copious data set. Given the experimental nature of the protocol, I did not propose any processing modality ahead of time—I needed to see what happened. I found it too trivial a question to investigate this in terms of whether they had been embedded or not, I had developed the protocol as an invitation to reflect on what potentials had been embedded and to actualize some in an hour.

In fact, it was quite clear that something had been embedded: in only one instance did a participant need to browse the website to remind themselves of a project, despite the months long gap between some of the participant's activity in SloMoCo. Although unsurprisingly most were curious about the format of the interview and speculated on my own research designs, all engaged generously by appropriating the time and space to reflect and recall anew their own projects and others' projects that made impressions on

them.

Generous appropriation is a useful descriptor. Although the prompts were admittedly opaque, no one asked about whether their activities and responses were done correctly. Instead, each retooled the prompt in their own way. One respondent stopped talking and making entirely, taking the camera outdoors to activate sonic objects with the environment. Another told stories unrelated to the SloMoCo event.

With the images participants captured and selections I took from the transcripts, I created a dynamic web art collage (www.potential.art). The collage displays the selected ~50 photographs from each of the 10 participants, makes messy co-locations and juxtapositions between photos. The bounds of each participants' contributions are localized by not aesthetically bounded.

Conclusions

After the protocols and later re-examining the data, I began to rethink aspects of the experiment. While each participant clearly valued their experiences with the SloMoCo community and that they had been affected, I realized I had made a mistake in articulating my research question. The question of *what* had been embedded is also uninteresting to answer: the virtual always exceeds the actual, when something is actualized, more becomes virtualized.[80] The question I ask now was *how* had the slomoco-event-machine, of which each participant was a part, virtualized potentials, and

[80] The brand of holist ecological philosophy that emphasizes that 'everything is connected to everything,' will not help us here. Rather, everything is connected to *something*, which is connected to something else. While we may all *ultimately* be connected to one another, the specificity and proximity of connections matters—*who we are bound up with and in what ways*" (Van Dooren quoted in Haraway, 2016, p. 173)

when these potentials actualize are actualized, how do they relay the character (or information) of the slomoco-machine?

The collage containing the quotations from the research protocol and the images produced gesture toward this. Of course, there is no family resemblance between the photographs of the props and the work made in SloMoCo. While the props that were made are indistinguishable for other paper prototyping research, while they look as unpolished as one might expect from a timed protocol session, I am sure I could not have omitted them from the collage; to me they are charged with the protocol process, embedded with more potentials.

Although the remarks that SloMoCo produced more SloMoCos was validating and inspiring to me, at the end of the Fall session it felt clear to me that the project needed hibernation. While I considered making this collage interactive, allowing for more annotation, more iteration, more machinic transduction of thought, I refrained. Guattari maintained that psychoanalysis needed a point of termination, the production of a cure. I do not offer this as any last word on SloMoCo, but it does solidify a kind of cure in terms of institutional analysis. In this collage, I sense that something has been cured: a nourishment preserved or made useful for another time, after a hibernation.

CHAPTER 5

CONCLUSION: MEDIA DIAGRAMMATICS AS SPECULATIVE ENGINEERING

The Diagrammatic Media Object

Media diagrammatics is a practice of making diagrammatic media. I have provided accounts of media diagrammatics in different capacities throughout this dissertation but have not clearly explicated precisely what diagrammatic media does, or what it mediates. Before I talk more about future work, it is worth doing so now in conclusion.

Diagrammatic media object (or MediaObject in chapter one) is a building block of speculative engineering.[81] It is found one way or another, in the living room, in a book, on a walk, in a paranoid rumination. It is either: 1. Both concrete and abstract (I see a tree but take it with me as tree) or 2. It is abstract (as a "what if" or hyperobject[82]: a dream job, climate change, one's own death) and it is enmeshed in constellations of concrete or extensive objects that one knows or used to know.

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[81] For a related re-reading of the media object via the processual philosophy of Alfred North Whitehead, see (Murphie, 2016). He writes: "In so far as we continue to inhabit dominant conceptions of media and communication, we might need, once again, to rethink 'media and mediation as *conceptual objects* in their own right … whether or not there is even such a thing as a media object'" (interior quotations are Thacker, Galloway, and Wark in Murphie, 2016, p. 24).

In the short introduction to the collection containing Murphie's article, (Manning et al., 2016) borrow from Charles Pierce the definition of an object as a "a 'bundle of habits' (2009, 279). We live amongst bundles, endlessly inventing techniques for reshaping these bundles, and sometimes, rarely, encountering what hasn't yet been bundled" (interior quotation is Peirce quoted in Manning et al., 2016, p. 10).

[82] See (Morton, 2013).

These constellations of objects provoke both thought ("Something in the world forces us to think. This something is an object not of recognition but of a fundamental *encounter*. What is encountered may be Socrates, a temple or a demon." (Deleuze, 2004, 139)) and feeling ("It may be grasped in a range of affective tones: wonder, love, hatred, suffering. In whichever tone, its primary characteristic is that it can only be sensed" (Deleuze, 2004, 139)). Following Deleuze's pursuit of a new image of thought, diagrammatics calls to abandon this kind of thought from "recognition", which assumes that what we encounter in the world is the same as it was yesterday.

We never return, but in feeling something we find it easy to deign to think and to say we know. Not only to we find it easy to call it recognition, but we also desire for it to be so in that we desire to have mastery over time and space. Death is literally the ultimate diagrammatic media object[83]. Death is the object of supposed "recognition" although it is impossible to recognize, even on the deathbed. Death is instructive because we can talk about what happens when we see a wreck on the highway and imagine our own death—to provide an alternative account of what Freud would call fantasy in terms of diagrammatics.

This thinking feeling is an abstract machine that constellates us amongst abstract objects (and abstract objects with concrete referents). The wreck on the highway, the temple, the Fleetwood Mac record are cathetically imbued because they are a cog in an

[83] For a more sustained practice-led inquiry into the relationship between death and media, see (O'Gorman, 2015).

abstract machine that mediates between (in Simondon's terms)[84] the abstract individuated psychical being (what's on your mind?) and the pre-individual (the function of the image of thought as recognition is not only socially and culturally habituation, but that this image works as a kind of psychological defense mechanism against the radical openness of the pre-individual. In some cases, we can understand the radical simplification of the world into objects of recognition as motivated by a kind of death drive).

As a mediator between pre-individual and the psychical individual, diagrammatic media constellates a relationship what is commonly understand as the past. Diagrammatics builds a model of subjectivity that works for its builder. The important work that diagrammatics does in part is to determine how it is you got where you are. In this sense the diagrammatic media object allows us to take up new relations to the past (to arrange them "autobiographically" to tell a new version of "the same old story").

But a second function of diagrammatics is to be able to go on with our lives in a new way, to create the conditions to find new collectivities and to imagine and participate in the enactment of new futures. As far as the future is a Simondian transindividual (a limit, a horizon), media diagrammatics is a speculative engineering or a world building that is forever stranded in a liminal space between the individuation of abstract machines and concrete machines. Diagrammatic media is social media in that it enacts "machines

[84] I am creating a homology between the virtual/actual and the pre-individual/individual. I speak about this in terms of the virtual and actual in Chapter three. The virtual/actual is more useful because it allows the concepts to take verb forms "virtualize" and "actualize". However, Simondon's language gives more purchase on diagrammatics's potential to connect between abstract and concrete machines.

for fight anxiety" that produce belonging in collectivities with whom to assume the pursuit of the transindividual. All of this from the humble diagrammatic media object.[85]

Engineering Post-Media Futures: Poiesis, Critique, and A Call for More-Than-Disciplinarity

In earlier sections I have mentioned Guattari's somewhat utopian vision of a post-media era in which old styles of mediatic centralization are subverted by decentralized telecommunications structures and appropriated by molecular subject groups. I find it challenging to subscribe to such a vision in 2022, a time in which subject groups can appropriate media technologies towards though production of subjectivity, but that production is overdetermined by extractive economic practices of the corporate entities that govern them. With social media today and the determining, normalizing, and corralling effects of what is with fear and derision called "the algorithm", we might be believe that de-centralization has failed to enact the heterogenesis Guattari envisioned, or rather that molecularization is no longer a viable strategy for producing new subject groups. In a most cynical mode, we might say that we have always been post-media. These conditions have at best made the post-media project confusing, and at worst have made resisting such cynicism difficult.

Diagrammatic media reframes the conversations around technofluency (and pedagogy for instance) as a mode of resistance. As opposed to technofluency,

[85] In her remarks upon receiving the lifetime achievement award from the Society for Literature, Science, and the Arts, Donna Haraway mused about how one coffee cup could take her seminar around the world and into deep histories and futures.

diagrammatic media allows us to envision a notion of machinic fluency. Machinic fluency allows the design and engineering of both concrete *and* abstract machines, it permits a way of media arts practice producing diagrams of technical ensembles rather than interactive media systems. Diagrammatic media centers self-writing as acts of care for the self and community. Amid a world seemingly totalized by algorithmic extraction, it offers up technical making and futures building as a micropolitics that does not heel to zero-sum framings of agency. In a 2018 interview, documentary filmmaker and historian Adam Curtis said the most radical thing one could today is to do something wonderful and tell nobody about it (2020). I do not believe he is advocating retreat into bourgeois privacy. He means such an act subverts algorithmically prescribed modes of self-writing and transactionalist accounts of sociality, instead opening portals to more joyful poetic interventions in conviviality. Given the clinical and activist origins of Guattari's diagrammatics, media diagrammatics has a poetic and sociopolitical valence that cannot resign itself to critique in the old way:

> "critique lets us know that politics is radioactive, but politics is the radiation of critique. So it matters how long we have to do it, how long we have to be exposed to the lethal effects of its anti-social energy. Critique endangers the sociality it is supposed to defend, not because it might turn inward to damage politics but because it would turn to politics and then turn outward, from the fort to the surround, were it not for preservation, which is given in celebration of what we defend, the sociopoetic force we wrap tightly round us, since we are poor" (Harney & Moten, 2013, p. 18).

Without poetry, the post-media project is critical digital media studies in the humanities and critical making in the arts.

Indeed, the old disciplinary structures are deeply rooted and as proponents of inter- or transdisciplinarity have discussed, are insufficient for grappling with crises of

climate, technical media, and nationalism—all of which must be understood as crises of subjectivity. The transdisciplinarity governed by corporate logics would not enable more or life or less anxiety. As Deleuze and Guattari wrote: “smooth spaces are not in themselves liberatory. But the struggle is changed or displaced in them, and life reconstitutes its stakes, confronts new obstacles, invents new paces, switches adversaries. Never believe that a smooth space will suffice to save us” (1980, 180). The post-media project needs such institutional places for disciplinary experimentation sufficient for devising contemporary techniques of subjectivation.

Diagrammatics demands a more revelatory mode of transdisciplinarity than a buzzy speak about breaking down silos and utopian integrative post-disciplinarity. Diagrammatics needs an organization that preserves and nurtures the tensions and incompatibilities at the edges of disciplinary semiosis so that they may be decoded turned into transcodings or transductions and put to work in a new abstract machine catalyzing thought and practice.

Machine learning is a prime example of a mediatic and infrastructural technique underextended by disciplinary limits and in demand of such a diagrammatic, more-than disciplinary treatment. Yet the professionalization of engineers and bricoleurs alike permits only inter-disciplinary flirtation or courtship. In the last years, the stunning advent of generative adversarial networks, the language model of GPT-3, and text-to-image deep learning engines such as StableDiffusion have given pause to even the most adamant machine learning skeptics (including myself). Engineers, who no longer understand how their code works, throw up their hands and comment to code to say the

machine is dreaming. Engineering cannot collaborate in a way that allows their black box problem to be transformed by other research problems such as the crises of subjectivity, or by the problems of those interested in dreams and fantasy. Artists resort to tired appropriations of divinatory practices, or speak about working dialogically with computers in the same way early computational artists worked with chance, or people described working with Eliza. We all know some new perspective or insight must emerge. Meanwhile scholars of the unconscious (see Millar, 2021) have begun to observe that, like three kids on each other's shoulders in a trench coat, these higher-order probability engines may have contorted itself into the structure of the unconscious. How does Guattari's more radical, mechanospheric unconscious populated by abstract machines expand this problem?[86]

I loop the post-media project back to the work described in this dissertation: the *diagrammatic* prototype, creative discursive practice with (anxious) media ecologies, and slow organizations formations. I look forward to continuing this work in diagrammatic and more-than-disciplined fashion, identifying where it may find a home or homes, or perhaps if it must work as a nomadic science and put its home on its back. Another part is the continuation of diagrammatic creative work both in practice and in my teaching.

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[86] Guattari describes his machinic theory of the unconscious: "the unconscious works inside individuals in their manner of perceiving the world and living their body, territory, and sex, as well as inside the couple, the family, school, neighborhood, factories, stadiums, and universities … In other words, not simply an unconscious of the specialists of the unconscious, not simply an unconscious crystalized in the past, congealed in an institutionalized discourse, but, on the contrary, an unconscious turned towards the future who screen would be none other tthan the possible itself, the possible as hypersensitive to language, but also hypersensitive to touch, hypersensitive to the socius, hypersensitive to the cosmos… Then why stick this label of "machinic unconscious" onto it? Simply to stress that it is populated not only with images and words, but also with all kinds of mechanisms that lead it to produce these images and words" (2011, p. 10)

Future work will no doubt shed insights on this. While graduate school has allowed me to do theoretical practice as if it were art, time and other constraints have not permitted me the development of an artistic practice that diagrammaticizes as if it were schizoanalysis.

To this end, media diagrammatics may act as a private language in a creative practice that lives amongst artist who are institutionally disappointed and happy to try new technics. One challenge to the generation of new collectivities will be disincentivizing the professionalized competition and individualism that animates art institutions (and university institutions for that matter). Another is the unsustainable dilemma of art and technology practices, which continue to glorify its own entrepreneur of the self. And finally, convening, curating, and gathering will continue to function as a conduit for the ingression of more-than-disciplinary perspectives into post-mediatic projects. While this may find landing spots between disciplines, a large challenge for the work is to address the (alter-) economics of creating a plane of consistency for diagrammatic practices.

Media diagrammatics generates working models of subjectivity (abstract and concrete machines) via a making, thinking, feeling practices with media technologies. Adjacent to post-media theory and practice, it works towards new collectivities and institutions capable of hosting new forms of subjectivity that produce difference instead of similitude. While Media Arts and Sciences may be an institution ripe for institutional analysis, it is not clear such an intervention is welcome. Without the willingness of the analysand, there will be no cure, and we will be back to the space the institution has hollowed out for containing and neutralizing institutional critique. Diagrammatics

generates manifold questions that leak across disciplines and clamor for new institutional formations and collectivities: what can this tell us about the structure of subjectivity and what does it fail to elucidate? How have such technologies transformed the machinic unconscious? How can aesthetic categories sufficient to poeticizing the weird, alien, and the eerie elucidate what may be genuinely new kinds of experience? How can post-mediatic interventions molecularize these technics into diagrammatic and heterogenetic practices?

Towards a Practice of Media Diagrammatics

As a way of concluding, I consolidate the take aways of media diagrammatics as it pertains to creative practice and organizations.

MAS Meta-Models

Although it is not clear if it can be excised from its complicity with integrative capital, MAS offers an ingress into the potentially liberatory nexus of disciplinary apparatuses encompassing art practice, media studies, and technical métier. As those affiliated with MAS, we must consider and advocate for an institutional analysis that might produce the possibility of opposing integration. Such analysis would consider the economic, epistemological, political, aesthetic, ethical, and indeed subjective conditions under which an integrative technolibertarian subjectivity proliferates. This includes reckoning with the disavowal of political legacy of cyberlibertarianism (Turner, 2006; Mullaney et al., 2021) and other conditions that cohere MAS across the United States. If conditions do not permit this analysis, we must consider the generation of new kinds of organizations which critically appropriate from disciplinary apparatuses. These nascent

formations may more readily orient itself to practices focusing on the production of subjectivities.

Disciplinarity and Collaboration in Post-Media Practice

Following Guattari's post-media hypothesis (Guattari, 2013b; Apperich et al., 2013) and the calls in *The Three Ecologies* (Guattari, 2005), another MAS is possible and it is diagrammatic. Diagrammatics as a practice is both research and creation, both subjective (produces a consistency that works for a person) and collective (it is shareable and may be taken up by others). Not limited to diversification, diagrammatics concerns itself with the production of difference (Guattari, 1995). It models how we got here using whatever models are ready to hand and refuses to return to how things were. It complexifies, it repels reduction, simplification, and homogenization.

Interdisciplinary organizers and practitioners must take art practice seriously and on its own terms. This is not to argue a place for "autonomous art" (Burzywoda, 2020). Autonomous art correctly positions art as a discipline with its own intrinsic problems and celebrates the problematic, but mistakenly alienates itself from non-art by overemphasizing the singularity of these problematics. To elide this gesture with an older one, we must understand the conditions under which we can even begin to care about whether we listen.[87] Indeed, as was my task with radiophonics in chapter 3, art practice has the unique ability to charge up everyday objects energetically and emotionally. Not merely in terms of sentiment, art practice imbues objects with the charge of a

[87] See (Babbit, 1958). Provocatively titled by editors "Who Cares if you Listen?", Babbit's original title was "The Composer as Specialist". Following Babbit's wording, specialization generates depth necessary for producing dissonant, diagrammatic, and anti-integrative disciplinary configuration.

BwOdystorm, attuning us to an object's diagrammatic mediation between actual and virtual, creating portals to new collective subjectivities. Creative practice also permits discursive polyvocality that subverts mastery while providing special access to cartographies of subjectivity and productions of collectivities.

A transdisciplinary collaboration not predicated upon instrumentalization necessitates the possibility of caring for the disciplinarily embedded problematics across disciplinary bounds. It also requires setting aside those problematics as far as they do not serve production of a shared and collective problematic. This means that the problematic cannot be stated ahead of time. Instead, we might frame collaborative organizations as events which have their own subjectivity[88] Events may be conditioned and cared for (Manning & Massumi, 2019) in a way that sets their stakes (Manning & Massumi, 2014). The opposite of democracy, to say "anything goes" is to permit latent and potentially oppressive hierarchies to manifest (Freeman, 2013). Conditioning such events to allow people and disciplinary configurations to arrive on their own terms and to retain their own intellectual, economic, and subjective autonomy is essential to fostering meaningful and transformative collaboration. It is only under these conditions that we can begin to work towards a collectively. To reiterate the point of Guattari's heterogenetic model: "individuals must become both more united and increasingly different" (Guattari, 2005, p. 69).

Speculative work needs its reality principles. In organizations aspiring to radical democracy, this means not only considering material conditions of participants, latent

[88] See (Ramos, 2020) who, following Alfred North Whitehead, understands social organizations as events.

hierarchies, but also the polluted state of mental ecology. “We are all very anxious” (Institute for Precarious Consciousness, 2014a)—a psychological effect of our nervous systems’ hijacking by emotional capitalism. This is a starting point for any organization. To this end, we must also accept that the Simondonian transindividual is a limit case. Indeed, any radically plenist transubjectivity is a rare event and cannot be taken as a starting point. We must be able to admit that we are starting from a place of deep social alienation, psychical affliction, and economic precarity. Only once we have dispensed with toxic positivity and hyper productivity can organizing as creative practice strive to create capacity for individuations to find collective and psychical belonging towards a collective enjoyment. Anxiety is a clue. We must make ways to enjoy it and lead us out into new ensembles.

Techniques of a Minoritarian Technical Ensemble

Following the Critical Engineering Manifesto, media diagrammatics must accept that engineering is a “transformative language of our time, shaping the way we move, communicate and think” (Oliver et al., 2011). Genies escape their bottles. It is easier to imagine the end of the world than it is to imagine the end of engineering practices. Indeed, technical depth is indispensables. Media diagrammatics is not a critique of specialization but a project seeking to generate para-formations that re-orient and appropriate dominant practices.[89] Alongside the engineering of concrete technical systems, diagrammatic media demands a practice of speculative engineering of abstract

[89] For more on technical depth and its ethical and political dimensions, see (Vasquez et al., 2022).

machines. In the shadow of extensive engineering, this practice of intensive engineering is not ancillary but minoritarian. These minoritarian formations call out for new techniques of organization at timescales required to take on the pedagogy, exchange, and production of new modes of diagrammatic making.

The recurrence of the BwO troubles media diagrammatics' call for new modes of organization indeed the very institution of the majoritarian institution. Can there be a minoritarian institution? The BwOdystorm takes us beyond the pale. As John Protevi reminds us, as the opposite of organism, the BwO is not death but depravity: "being an organism means that your organs are Oedipally patterned for hetero-marriage and work. Getting outside the organism does not mean getting outside homeostasis guaranteed by a certain organ form so much as getting outside Oedipus into what Oedipal society calls 'depravity'" (Protevi, 2017, p. 11). Likewise, not every organization must be a temporary autonomous zone (Bey, 1991). Following (Wilde, 2020), we should accept too that "the singularity has come and gone"—art and technology practices in particularly must embrace social organization as a primordial technology. This is not to reduce organization to technocracy or to repeat the mistake of the new communalists who tried to abandon politics. Rather, it is a call to take up organization as a creative practice to seek out ways of responding to affective micro-revolutions in an organization's micropolitical sphere. Indeed, these technologies of organization must be underwritten by and ensure the continued possibility of the political.

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