Interdisciplinary Anticipations: Art-Science Collaboration at the Maastricht Brain Stimulation and Cognition Laboratory

Flora Lysen

Introduction

An air of excitement has filled the lecture hall. Dozens of spectators have gathered in the auditorium of the Maastricht University's Department of Cognitive Neuroscience. For some of them, the hall is a familiar professional environment for meeting and interactions with colleagues. Other visitors come from outside the field and have never been in this part of the university or, for that matter, the city. The event marks the end of a first-time collaboration between an artist and the Maastricht brain scientists. Finally, after fifteen months of studying the researchers and their academic practices, the artist will now present her findings.

During that fifteen-month period, some of the people present in the auditorium have grown to like the artist—as a new presence in the research group meetings and lab spaces at the Maastricht Brain Stimulation

F. Lysen (✉)
Department of Society Studies, Faculty of Arts & Social Sciences, Maastricht University, Maastricht, The Netherlands
e-mail: f.lysen@maastrichtuniversity.nl

K. Bijsterveld, A. Swinnen (eds.), *Interdisciplinarity in the Scholarly Life Cycle*,
https://doi.org/10.1007/978-3-031-11108-2_12

and Cognition Laboratory. “We really didn’t know what to expect,” one of the attending scientists told me. She interviewed quite a few researchers inside a glass cubicle in the department's hallway, a former ICT helpdesk office granted to her for the time of her stay. She even volunteered as a test subject and had her brain fitted with electrodes, as well as scanned and magnetically stimulated as part of the lab’s ongoing study of visual attention. “A tough cookie,” they said. Never asked to exit the scanner. But much of the excited buzz in the auditorium may also be due to participants being puzzled about why their department head chose to spend time on an art-science collaboration. In any case, the general atmosphere is celebratory. And there might be special guests in attendance. Some time ago, members of the university’s executive board expressed their interest in the department’s collaboration with the artist. They want to know what it could mean for the university. Could this be an “exemplary project” for innovative research?

The 2019 event outlined above marks the end of the first art-science research project funded by the Royal Netherlands Academy of the Arts and Sciences (KNAW) as part of its newly launched art-science platform Mingler. The artist Antye Guenther and neuroscientist Alexander Sack set out to examine alternative ways of conceptualizing and materializing rhythms of brain activity (patterns of electrical pulses generated by neurons) together (Fig. 1 in Chap. 11), while I—having brokered Guenther’s and Sack’s collaboration from an initial 2018 Mingler match-making event onward—joined incidentally to make sense of it all from my perspective as a cultural historian and science and technology studies (STS) scholar.

In this chapter, I examine the interdisciplinary aspirations of art-science collaborations using the first KNAW Mingler project as an example. From the start, implicit ideas about the potential virtues of interdisciplinarity underpinned Guenther’s and Sack’s endeavor. In fact, the website of the Mingler art-science platform states that it aims to foster “collaboration beyond the disciplines” and speaks of sharing “knowledge and skills between professionals,” as well as sharing “creativity, fascination and dedication” (Mingler, n.d.). Of course, such familiar terms, “creativity,” “fascination,” and “dedication”—and we may add “innovation,” “collaboration,” and “co-creation”—are virtue words (also called “ideographs,” cf. Van Lente, 2000), bound up with the indefinite

norms and values about research that shape notions of "interdisciplinarity," a concept that is especially prevalent in the art-science domain. Studying the unfolding of an art-science project up close allows a view of the way such ill-defined commitments develop, and how what we may call "imaginaries of the 'inter'" are shaped, that is, how such imaginaries are, to paraphrase Sheila Jasanoff, collectively held, institutionally (un) stabilized, and publicly performed (2015, p. 4). Such a situated approach may help to counteract an enthusiastic but frustratingly vague "normative weight," carried by the prefix "inter," as sociologist Felicity Callard and Des Fitzgerald explain in *Rethinking Interdisciplinarity Across the Social Sciences and Neurosciences* (2015, p. 4). As argued by the authors, eagerness about interdisciplinarity may eclipse a critical examination of the conceptual assumptions, institutional mechanisms, and concrete actions that inform calls to cross disciplinary boundaries. In their words, "interdisciplinarity is a term that everyone invokes, and no one understands" (p. 4).

In this chapter I take heed of such critiques of ubiquitous, yet nebulous calls for interdisciplinarity, and I aim to capture some of the social, epistemic, and symbolic operations of this slippery term in action. Tracing the Maastricht Mingler art-science collaboration from its start to its (provisional) end, I am particularly interested how interdisciplinarity impacts "epistemic living spaces," as Ulrike Felt calls the multidimensional structures that shape how research is (and can be) done and how one can be a researcher (Felt, 2009). Based on the notion of epistemic living spaces, it is possible not only to pay attention to policy discourses and social imaginaries that influence epistemic cultures but also to call for attention to other, tacit structures, such as the more "implicit dimensions of 'being in a field'" and the subtleties of interpersonal relations (p. 20).

As a participant-observer of Guenther's and Sack's project, my own expectations inevitably pervade my analysis. Therefore, I start this chapter by contextualizing my initial enthusiasm for collaboration in the field of art-neuroscience. I first describe how such collaboration can be seen as part of a boom in art-science projects, while also representing gleeful hopes for potential insights to be generated from interdisciplinary research between the neurosciences on the one hand and the social sciences and humanities on the other. Secondly, I reflect on the process

of match-making through Mingler and my presumptions in brokering an art-science collaboration between an artist and a neuroscientist. Moving on to describe the shifting status of "collaboration" in the project, in the third section of my chapter, I point to the pervasive presence of anticipation and confusion as typical affects in interdisciplinary work. Finally, describing the grand finale of the art-science project, I note a shifting of established hierarchies that can momentarily take place within the space of a collaboration. During Guenther's final performance at the faculty, an underdetermined and fuzzy set of expectations or "potencies" around joining different disciplines allowed for a playful destabilization, as implicitly invoked by her title: "MAASTRICHT TRANSFORMATIONAL SUPERNODE GATHERING OF INTELLIGENT MINDS: No Body, Never Mind — How to Beautify Your Brain Data and Use it to Unleash Your Full Potential."

Interdisciplinary Aspirations, High Hopes

My initial personal expectation about the interdisciplinary potential of a new art-neuroscience collaboration was high. In the past fifteen years or so, I had observed and studied many interesting art-science projects as part of a surge of research-oriented efforts at the intersections of art and the brain sciences. From cognitive scientists collaborating with dancers to conceptualize synchronicity in brains and interacting bodies (Mutual Wave Machine, Suzanne Dikker, and Matthias Oostrik), and film makers working with synesthesia researchers to emulate the feeling of sharing a sensation with an object (Sensorium Tests, Daria Martin), to STS researchers working with cognitive scientists to create an "experiment-performance" that questions the established protocols of a psychology experiment (Klein & Margethis, 2017). Each art-(brain)science project assembles a very particular set of disciplinary expectations and institutional architectures.

As pointed out by sociologists Andrew Barry and Georgina Born, art-science can function as an exemplary field to study the dynamics and politics of interdisciplinarity (Barry & Born, 2014). Drawing on their work, I have studied several art-science projects to examine how they

allow different disciplinary relations—critical, explorative, celebratory, ambiguous, even though such adjectives are clumsy and imprecise—among the arts and vis-à-vis the brain sciences (Lysen, 2019). Art may take on the role of ethical or critical commentary on research, for example, on the enduring hype surrounding neuroscientific research. It may offer an approach to social engagement in academia, a way of fostering the marketability of a science or a technology, a form to address affective and ineffable elements in research, a method for science to become more methodologically reflective—as well as all of the above, to different degrees, at the same time.

Analyzing such intersecting dynamics in art-science projects, Born and Barry provide a valuable conceptual taxonomy of three main "logics of interdisciplinarity": a "logic of accountability" through which art-science works are meant to stimulate debate about and engagement with science, a "logic of innovation" through which art-science is situated as a partner in providing new insights for innovation (two logics that largely render art subservient to science), and a "logic of ontology" that may constitute a true hybridization of fields (Born & Barry, 2010). The ontological dimension is present when art-science practices redefine the object of research and the subjects and publics engaging with it, contributing "to the generation of something new within scientific practice itself, challenging the boundaries of disciplinary authority" (p. 114). For this reason, accountability, innovation, and a type of generative disciplinary disruption feature as central expectations attached to interdisciplinary in art-science projects.

Today, interdisciplinary forms of art research are booming in particular. The field of art-science, it seems, has finally moved away from its long-time "nascent" status to become a more mainstream phenomenon. "Scientists and artists are working together as never before," the journal *Nature* headlined in 2021, dedicating a number of articles to the phenomenon (The Editors of Nature). Since the 1990s, art-science residencies and art-technology collaborations have become increasingly institutionalized and professionalized (Wisnioski & Zacharias, 2014). By now, it is impossible to list the number and variety of collaborative platforms, residencies, funds, foundations, and institutions that allow interfaces between arts and research. This is also evidenced in the

expanded vocabulary used to refer to art-science collaborations: "sciart," "artsci," "bioart," STEAM (science, technology, engineering, arts, mathematics), SEAD (science, engineering, arts, design), art-science, art & technology, artistic research, research creation—not to mention subfields such as art and medicine and the medical humanities. All of these terms come with different conceptual inflections and (institutional) histories of course.

This context explains my specific interest in participating in an art-science project, which was triggered also by a more recent addition to the heterogeneous set of art-science infrastructures and projects: the field of "Art and Science and Technology Studies," abbreviated "ASTS" (Rogers & Halpern, 2021, cf. Borgdorff et al., 2019). By adding the term "Arts" to the existing discipline "STS," a discipline which itself emerged out of interdisciplinary activities, ASTS rhetorically positions itself as a new discipline, even though Hannah S. Rogers and Megan Halpern prefer to speak of a "framework," "an emerging way of knowing," or a "new knowledge field" that examines art-science across the natural or life sciences, the social sciences, the humanities, and the arts, using STS as a methodological lens but adding artistic methods to STS at the same time (Rogers & Halpern, 2021, n.p.). The "A" in ASTS, then, denotes both an object of study (projects that interface art and other disciplines) and a methodological innovation. Artists, in Rogers's view, may be making "STS arguments" by "material means" and in tandem, while established STS methods can be enriched by research in and through the arts. In fact, a number of authors in the *Handbook of Science and Technology Studies* (Felt et al., 2016) argue that if STS was more open to research through the arts, STS itself would become more experimental; it would not only observe people "thinking with eyes and hands," but "[use] eyes and hands to intervene and interfere in spaces and sites where science and technology are constructed, distributed, used, incorporated, and enacted" (Salter et al., 2016, p. 154).

So, it is this recent attention to ASTS, combined with a general boom in art-science work, that had my interest, which met with another, parallel development: the call for more interdisciplinary research into the human brain. Indeed, while dreams of new synergies and cooperation loom large everywhere in academia, the pervasive promise of inter- or

transdisciplinarity has perhaps been important in particular for the field of neuroscience (Callard & Fitzgerald, 2015)—a field typified by some as a "hybrid of hybrids" (Abi-Rached & Rose, 2010). Scholars subscribing to an emerging field of Critical Neuroscience, for example, have cautiously suggested that some forms of inter- or transdisciplinarity may be a way forward in conducting richer, more nuanced neuroscientific experiments with an "ethos of reflexivity," designing and conducting brain research that is aware, for example, of the complex interchanges between biological and social developments (Slaby & Choudhury, 2017). In fact, it is suggested that interdisciplinarity research by humanists and social scientists together with scientists could perhaps be a means to arrive at "a more expansive account of human development and subject formation" (Frost, 2018), as well as to counteract a reductionist understanding of the brain and human behavior.

At the same time, such high hopes for interdisciplinarity are also met with skepticism, as they may leave unacknowledged the power asymmetries between the authoritative and well-funded discipline of the neurosciences versus the publicly less-prestigious and underfunded disciplines of the humanities, social sciences, and the arts, which are thus prone to be cast in a subservient role. Moreover, there are few accounts of what interdisciplinarity actually *does*. While there are many calls for interdisciplinary research, the actual procedures and effects of engaging novel disciplinary relations are often left underexamined (Fitsch et al., 2021). In this respect, Callard and colleagues emphasize the importance of studying closely the actual configurations of multidisciplinary practices to adjust ideal-type descriptions of collaboration and boundary work and to gain more insight into the unfolding of "science-and-humanities-and-arts-in-the-making" (Callard et al., 2015, p. 4). Thus, it was with a call to study "science-and-humanities-and-arts-in-the-making," as well as with an eye to ASTS and the curbed incredulity of interdisciplinarity, that I set out to participate in one of the first match-making events for artists and scientists in the Netherlands, the initial KNAW Mingler evening.

Match-Making, Co-laboration

I met the scientist in a room with stucco ceilings and gilt-framed mirrors in the seventeenth-century building of the Royal Netherlands Academy of the Arts and Sciences (KNAW), right in the center of Amsterdam. He was my top choice out of a number of potential matches during an evening organized as part of the Academy's new art-science Mingler collaboration platform encouraging "interaction and synergies in scientific and artistic research" (Mingler, n.d.). For the time being, the platform was open by invitation only, a privilege new members could extend to three new invitees. In Mingler's online interface, participants are prompted to describe general interests and to select (from a standardized drop-down menu) academic and artistic disciplines to be matched with. In a tongue-in-cheek fashion, a visual interface also allows participants to select the characteristics of a fitting collaborator, choosing between affinities for "thinking" and "doing," "details" and "bigger picture," "process" and "result," "risk" and "certainty." Reducing these categorizations to simple buttons on a mix panel somewhat ironically hinted at the impossibility of quantifying the process of (inter) disciplinary "mingling."

My match, professor Alexander Sack, head of the Brain Stimulation and Cognition laboratory and research group at Maastricht University and an expert in the field of transcranial magnetic stimulation, and I sat on plush chairs to discover our mutual interests. We talked about the portrayal of neuroscientific research in popular media and the allure of colorful brain visualizations that journalists and neuroscientists—we both agreed—used to amplify the power of brain-centered explanations of social and cultural phenomena. With witty irony, Sack lamented the fact that such pretty pictures were sadly lacking in most of the brain rhythm measurements he carried out in his lab. His group's focus was on using non-invasive brain stimulation to understand basic mechanisms of perception and attention, as well as on research into the clinical application of brain stimulation to treat patients with severe depression. Clearly, even without attractive brain images, brain stimulation was a mesmerizing topic. Sack showed me a video of a black magnet hovering just above the

head of a person speaking, who suddenly stopped mid-sentence when the magnet was activated: "Humpty-dumpty sat on a wall, humpty-dumpty had a great fff[…]" (Read, 2011). The field of brain stimulation research conjured its own captivating science-fictional imaginaries that invoked speculations of mind control and anxieties about future misuse of this technology (Rose & Rose, 2016). I told professor Sack about artists but also social scientists and humanities scholars (like myself) who would perhaps be interested to study the way the lab workers engaged with and perhaps even participated in such imaginaries. Our match-making had worked: we agreed to continue our conversation and to think about a collaborative project, perhaps inviting an artist to work with us.

Only later, after more interactions with the scientists in Sack's research group, I realized the presumptuousness of my initial proposal to "bring" critical artistic and STS insights to the lab. Anthropologist Jörg Niewöhner, analyzing anthropological research into natural sciences, has characterized this attitude as a mode of "critical engagement": a way of relating that predominantly aims to deconstruct "the epistemic regimes to reveal illegitimate reductions of the richness of human group life to material quantities" (2016, p. 1). He recognizes this attitude in particular in STS projects, often geared toward deconstructive critique, even though STS scholars "by turning their revelation of contingency into propositions for the field" may "hope to produce a productive intervention" (p. 16). However, in the months to come, I would begin to see how the Maastricht lab members were not the reductionist researchers in need of extra-disciplinary insights and productive interventions that I too had somehow imagined them to be.

For one, the Maastricht Brain Stimulation and Cognition laboratory had a longer history of hosting researchers from other disciplines. Not long ago, a philosopher of technology had videotaped interactions with the brain-stimulating magnetic device and had sat in on numerous lab meetings. In addition, three lab researchers had taken the issue of the dystopian visions attached to neuro-enhancement head-on in a scientific article, proposing alternative ways to conceptualize the ethical threats posed by fundamental stimulation research (Duecker et al., 2014). Lab members self-organized reading groups in philosophy of science and neuroscience, while discussions about epistemological issues in

brain-imaging—throughout all our conversations—were quick to surface. Certainly, these scholars developed critical perspectives from within the field—without extra-disciplinary visitors needing to contribute smart, snappy commentary. Therefore, realizing the self-reflexive attitudes and practices in the lab, I experienced the classic anxieties of an anthropologist going native, if not the sense captured by Niewöhner when asking whether "the actors in the field knew all along what the anthropologists proudly present to them as their findings" (2016, p. 3).

To reconceptualize this issue of expert anthropology, Niewöhner proposes to cease thinking of the anthropologist as possessing some special kind of reflexivity. Rather, the anthropologist can work to strengthen the spaces and infrastructures that allow "reflexing" (practicing reflexivity) by all actors involved. Niewöhner proposes the term "co-laboration" for this model of "joint epistemic work, experimenting with formats without necessarily aiming for a shared goal" (2016, p. 10). Specifically in the context of art-science, Niewöhner's concept of co-laboration as a space for joint—but not exactly united—investigations may offer a significant alternative to an imagined collaborative vision of interdisciplinarity, of shared work, between artists and scientists.

But how can such joint co-laboration be facilitated? Callard and Fitzgerald note how a "rhetorics of reciprocity and mutuality" pervades the literature on interdisciplinarity and shapes an image of interdisciplinarity as collaboration based on "fair exchange" or a "fantasy of equal actors" (2015, p. 100). In practice, such mundane realities as funding rules are important determinants for the organization of art-science collaborations (Boehm, 2018): who visits who? What counts as a final result? Who determines the vocabulary for communicating about the event? And, perhaps, how do artists need to frame their work *as research* to be considered eligible for funding? For example, when in 2018 the KNAW first announced its first Mingler grant as an incentive for "starting art-science collaborations," it called for the roles of the artist and the scientist to be "balanced," but elegantly left open the exact nature of the collaboration in the grant applications rules, which asked to describe "the way in which different needs, perspectives and methods of the arts

and science come together" (Regulations for Mingler scholarship, n.d.). Nevertheless, only artists were entitled to a personal allowance paid from the grant.

It was after considering these conditions that I decided to broker between Sack and the artist Guenther, known to me for her critical work on the circulation of scientific images and imaginaries of brain control and for her creation of ceramic objects that give shape to abstract concepts as part of narrative installations. After introducing the two and some emailing back and forth, they did actually find mutual ground to apply for the Mingler grant together. Guenther proposed to investigate scientific practices and ideas at the brain stimulation laboratory for a fifteen-month research period. Together with Sack, she would investigate how researchers in the lab envisioned complex patterns of neural activity in the human brain, which would lead to a "speculative manual" proposing new ways of conceptualizing, visualizing, and/or materializing these brain rhythms (Fig. 1). My role as a cultural and social scientist was to engage in a second-order observation of Guenther's and Sack's intended art-science collaboration.

From the outset, it seemed evident that an interesting art-science project would need to steer away from the tendency to assign the artist the instrumental role of *visualizing* science "post-closure." Instead, one of the initial questions Guenther's and Sack's art-science project set out to examine was how scientists working in the Maastricht lab may be creating some implicit working concept of a complex pattern in order to engage in researching different aspects of brain stimulation. What images, phrases, metaphors, gestures, and materials were drawn upon to work with this oscillatory "unknown" at the center of brain stimulation research?

Sack, reflecting on his motivations for starting the art-science collaboration during a symposium on interdisciplinary research in the brain sciences, described his wish to participate as a way to transcend familiar epistemic and conceptual cognitive science conundrums (the much-discussed problem of "mental representations," for example) and move away from established habits and jargon in his lab: "I had the feeling it might be good to step out of this bubble and to talk to someone with a different perspective (…) with a completely different way of relating things,

Fig. 1 Research collage by Antye Guenther, based on MRI brain data visualizations assembled at the Maastricht Department of Cognitive Neuroscience, 2022 © Guenther

someone from a different field" (Fieldnotes Lysen, Brain Culture Interfaces workshop, 2019). What surprised Sack was Guenther's approach of investigating, "rather than a passive person in the lab looking at us from the outside trying to judge, challenge and to help … you wanted to become a part of the group." For Guenther too, this was a new way of working, to apply together for a grant, to draw up a plan together, we "somehow made an unwritten contract … we are both active." Key to her work in the project was to go behind the public image of the lab, beyond publications and lectures. But this different way of engaging, according to Guenther, also came "bittersweet": no longer could she just

"gather some things and go." The intensity of her presence meant high expectations were building up on the part of the scientists.

Anticipatory Feelings, Ambiguous Affects

Keeping track of this art-science project and meeting with Guenther and Sack from time to time, I witnessed the increasing embeddedness of the artist in the neuroscientific research environment. Guenther regularly participated in the group meetings, and she clearly knew her way around. She was acutely aware which projects the various researchers were working on specifically, what rooms people occupied, which deadlines they were trying to meet. The official KNAW-funded status of the project helped her to feel more comfortable being present in the lab, she said, allowing for a helpful sense of entitlement. Working together directly with Sack, the head of the department, also added to this sense of legitimate presence. Another important aid in levelling the playing field for her presence in the lab was the artist's previous expertise as a medical doctor—she had the outsider status of an artist paired with the credentials and background knowledge of a field much closer to the cognitive sciences.

Pursuing the project's initial research question—how do lab researchers imagine patterns in (the oscillations of) brain activity?—Guenther noted how scientists created gestures (wavy hand motions), used graphic notations (frequency bands), or employed metaphors (orchestra's) to make sense of the basic neural mechanisms under investigation. And, yes, these images were of course restrictive, one of her interlocutors agreed, "it's difficult to operationalize the questions one has … you have to simplify things to isolate the things you want to see. … What we see depends on what we already know" (Fieldnotes Guenther, cited during Brain Culture Interfaces workshop, 2019). Conducting interviews with lab members—from students to PhDs, postdocs, and senior researchers—Guenther was surprised, she later relayed, about the wide range of opinions and reflections on the state of the field, even in this very tight-knit and collaborative environment.

Gradually, her investigation spread into many different directions. Like a magpie in the lab, a self-proclaimed "scavenge hunter," Guenther's

method was to notice, to note, and to accumulate. Every now and then, she would share her finds: photographs of DIY lab set-ups, quotes from the neuroscientists she had interviewed, YouTube videos the lab researchers had used to explain a scientific phenomenon to her, materials and images from an adjacent fMRI-research unit, and goodies from a European Human Brain project conference. But when I myself noted a certain proximity to methods in laboratory ethnography and STS approaches, Guenther refused those labels, emphasizing instead her ultimate goal to produce art, her responsibility, however uneasy, for the final result of the project to take the form of a "work," as she put it. And in fact, during the process of assembling images and impressions, Guenther's presence was building up aspiration and expectations in the neuroscientists, too. Everyone in and around the research unit was aware the project was to culminate in some artistic format. Reflecting on her ambiguous position in Sack's lab, Guenther noted: "I feel they are all contributing to my practice. I hope … that I'll meet some of the expectations. That's my worry that I'm only taking. … I'm grateful for the time and commitment they give me. But I'm afraid to ask them what they get out of it" (Fieldnotes Lysen, Brain Culture Interfaces workshop, 2019).

Guenther's worries about reciprocity and anticipations are characteristic of the ambivalent feelings at play in (envisioned) interdisciplinary spaces. Callard and Fitzgerald (2015) emphasize that paying attention to such affective dispositions is key to understanding temporary social spaces of collaboration: unspoken distrust, power unbalances, productive vagueness, and a sense of awkwardness and ignorance, for example. In their own interdisciplinary experiments, the authors most often observed what they call "feeling fuzzy," a "feeling of confusion about what one is feeling" in the practice of working together (p. 115). In the context of the Maastricht art-science experiment, this consideration of the ambiguous affects of interdisciplinarity helps to better understand how uncertainties about the process and goals of the endeavor could be accommodated by the framework and the process of collaboration.

Puzzled feelings about the nature of the exchange ("what they get out of it") demonstrate the strange inversion of hierarchies that can take place within the space of an art-science project. Barry and Born (2014) describe

how some actors may envision art-science projects as providing a service to science, an instrument in making opaque and complex processes more approachable for a lay audience (the aforementioned "logics of accountability"). Yet, within the microsocial space of some art-science collaborations, these roles can also be partially inverted (Born and Barry give an example from the 1980s, when the researchers of the French Institut de Recherche et de Coordination Acoustique/Musique [IRCAM] directed much of their scientific and technical force into the preparation of Pierre Boulez's music piece *Repons)*—instead of artists serving science, scientists can offer resources for autonomous artistic projects (p. 12).

At least for Sack, so it appeared, it was the artist's continuous active presence as embedded outsider and the process of attuning to that presence by the lab members that constituted a major part of the perceived value of this art-science project. This meant the Maastricht Mingler project was characterized by a peculiar disjunction. On the one hand, the project entailed the "open," "shared," and "inquisitive" process of an artist aligning with the collaborative style of working in a laboratory research group. But on the other hand, Guenther's simultaneous solo practice, being equally central to the project, was situated alongside the laboratory (in the artist's laptop, in her studio, and in her mind)—a practice relatively opaque and closed to the researchers—which secured the autonomy of the artist in this art-science alliance. Ultimately, it seemed that the enduring uncertainty regarding the project's final outcome did not bother the lab workers so much as it added to a welcome sense of positive excitement. A date for a final presentation had been set in the research group's calendar. They were looking forward to "it."

Grand Finales, Exceptional Powers

Expectations had run high indeed. Although it felt as if the project had only just started, the academic funding scheme specified that the Maastricht art-science project needed to end. Guenther picked the format of a performative lecture as a fitting medium to assemble the array of narratives, images, and objects gathered during her fieldwork. Sparked by her finds and observations at the Maastricht lab, she created white

porcelain brain-shaped vases based on 3-D images. These delicate-looking oddities functioned as "props" for her final performance entitled, as said, "MAASTRICHT TRANSFORMATIONAL SUPERNODE GATHERING OF INTELLIGENT MINDS No Body, Never Mind — How to Beautify Your Brain Data and Use it to Unleash Your Full Potential," which was staged multiple times in October 2019. By choosing the genre of performance, Guenther could appropriate and subvert the postures, movements, and explanations she had encountered in the lab and wider sphere of neuroscience, playfully alluding to the wealth of popular science lectures and TEDtalks featuring brain scientists.

Situating the performance in the auditorium of the Maastricht neuroscience department, Guenther subtly transformed this academic space into a stage: adding theatrical stage lights to the existing technical infrastructure and wearing a custom-made dress from exactly the same soundproof material as the backwall of the room. While the Maastricht neuroscientists had mostly warded-off associations with brain stimulation as a form of cognitive enhancement—wary of science-fictional exaggeration and hype—Guenther reintroduced those associations, bringing para-scientific worlds back into the space of the department. Throughout the performance, Guenther shifted between characters, performing fragments of commentaries that to me seemed hints of a scientist performing an experiment and of an archaeologist of the future, excavating remainders of society that had suffered total data annihilation, trying to make sense of an artist's notebook found in a Maastricht University department.

Observations on experimenting and experimentation continuously intersected in the performance. Guenther made astute and witty comments on her own experience of lying inside a scanner, much in line with the work of STS researchers questioning neuroscientific research paradigms while participating in a brain recording (Roepstorff, 2001; Langlitz, 2013). Moreover, the spectators present in the auditorium were themselves cast into the role of experimental subjects ("let's synchronize our brain waves"), subjugated to a subtle protocol of subliminal influencing, hypnosis, and priming in which the artist took the role of the authoritative scientist-motivator puppeteer, clearly at the top of the disciplinary food chain. Now, for this one hour of performance, Guenther

ironically addressed the power dynamics of art-science, at one point framing the event as a match-making where neuroscientists could find "highly motivated" visual artists, who

> do not only come with evidently sharp minds and these exceptional powers of imagination … No one takes them really seriously. Everyone enjoys their exotic presence, they spark everyday routines, while opposing no real threat to no one. And this perception is crucial to us, as it opens so many otherwise closed doors. (Performance notes by Antye Guenther)

Direct commentary on the project's uneven foundation was paired with accounts of scientists trying to visualize concepts and jokes about the hubris and omnipresence of the brain in pop culture.

I experienced the performance as a mesmerizing puzzle movie, a complex narrative of clever analytical pieces, in which I sensed a pattern but could not grasp it—just yet. In the days and months after the project's grand finale, one neuroscientist-spectator told me he saw the piece twice to try to get a better understanding of its structure and dialogue. Another visitor from a different department lamented not having been part of the process, to "see all the connections," and hopes the project will find a second iteration at his workplace. Some of the reactions to this artistic finale—a feeling of bewilderment, of not knowing, but excitement over its collaborative audacity—reverberate again the ambiguous affects that characterized the process of this art-science project all along. Ultimately, what remained after the performance was a sense of potency—a new mode of working had (only just) begun to emerge and needed further exploration.[1]

[1] And, indeed, collaborations continued after the Mingler art-science project in Maastricht. Sack, Guenther, and I wrote a visual-textual exercise in "interdisciplinarity" together, which we hope can be helpful for other collaborators in art-science (Guenther et al., forthcoming). Guenther built on her work at the neuroscience department to start a new research project as the first PhD candidate in artistic research affiliated to Maastricht University as part of the MERIAN research in the arts network.

Conclusion

While notions of collaboration and co-creation often cast interdisciplinarity in a romantic light and suggest a productive and innovative "symbiosis" of disciplines is possible, my above-discussed analysis of a specific trajectory of art-science collaboration shows that uncomfortable affective dispositions may result from a temporary joint project. As a participant-observer of Guenther's and Sack's attempt at art-neuroscience collaboration, I have noted momentary inversions of hierarchies and a-synchronicities: the scientists at the Maastricht Brain Stimulation and Cognition laboratory who facilitate an artist who is trying hard to live up to rising expectations; the artist who carves out a space for autonomous artistic practice parallel to group participation; and the potential of the performance medium to allow—if only for a very brief moment—a switching of the established balance of power.

My analysis revealed how the open-ended structure of Guenther's and Sack's art-science collaboration allowed for a shift in focus not so much on a material effort of co-creation, but on the presence of the artist in the research spaces of the neuroscientists. A growing feeling of anticipation for a "final artwork" was an important part of this trajectory. It was precisely this affective structure of anticipation that opened up prospects of resistance and allowed participants to play with hierarchies in unexpected ways. The tacit affective dispositions I describe in this chapter demonstrate the implications (ideals) of interdisciplinarity in particular situations, beyond a mere discursive analysis of imaginaries of the "inter." Rather than ask "how is this art-science project interdisciplinary?" I have traced a process of "science-and-humanities-and-arts-in-the-making": The first KNAW Mingler art-science project in Maastricht that I have analyzed here underscores how different actors—including myself—shape aspirations for—and anticipations of—*doing* interdisciplinarity.

References

Abi-Rached, J. M., & Rose, N. (2010). The birth of the neuromolecular gaze. *History of the Human Sciences, 23*(1), 11–36.

Barry, A., & Born, G. (2014). Interdisciplinarity. Reconfigurations of the social and natural sciences. In A. Barry & G. Born (Eds.), *Interdisciplinarity: Reconfigurations of the social and natural sciences* (pp. 1–56). London: Routledge.

Böhm, B. (2018). From heterogeneity to hybridity?: Working and living in arts-based research? In P. Sormani, G. Carbone, & P. Gisler (Eds.), *Practicing art/science: Experiments in an emerging field* (pp. 125–141). Routledge.

Born, G., & Barry, A. (2010). Art-Science: From public understanding to public experiment. *Journal of Cultural Economy, 3*(1), 103–119. https://doi.org/10.1080/17530351003617610

Callard, F., & Fitzgerald, D. (2015). *Rethinking interdisciplinarity across the social sciences and neurosciences*. Palgrave Macmillan.

Callard, F., Fitzgerald, D., & Woods, A. (2015). Interdisciplinary collaboration in action: Tracking the signal, tracing the noise. *Palgrave Communications, 1*. https://doi.org/10.1057/palcomms.2015.19

Duecker, F., de Graaf, T. A., & Sack, A. T. (2014). Thinking caps for everyone? The role of neuro-enhancement by non-invasive brain stimulation in neuroscience and beyond. *Frontiers in Systems Neuroscience, 8*. https://doi.org/10.3389/fnsys.2014.00071

Felt, U. (2009). Knowing and living in academic research. In U. Felt (Ed.), *Knowing and living in academic research: Convergence and heterogeneities in European research cultures* (pp. 17–39). Institute of Sociology of the Academy of Sciences of the Czech Republic.

Felt, U., Fouché, R., Miller, C. A., & Smith-Doerr, L. (Eds.). (2016). *The handbook of science and technology studies*. MIT Press.

Fitsch, H., Lysen, F., & Choudhury, S. (2021). Editorial: Challenges of interdisciplinary research in the field of critical (sex/gender) neuroscience. *Frontiers of Sociology.*. (forthcoming).

Frost, S. (2018). Ten Theses on the Subject of Biology and Politics: Conceptual, Methodological, and Biopolitical Considerations. In M. Meloni, J. Cromby, D. Fitzgerald & S. Lloyd (Eds.), *The Palgrave Handbook of Biology and Society* (pp. 897–923). Basingstoke, Hampshire: Palgrave Macmillan.

Guenther, A., Lysen, F., & Sack, A. (forthcoming). Circulating neuro-imagery – an interdisciplinary exercise. In S. Besser & F. Lysen (Eds.), *Worlding the brain. Interdisciplinary explorations in cognition and neuroculture*. Brill.

Jasanoff, S. (2015). Future imperfect: Science, technology, and the imaginations of modernity. In S. Jasanoff & S.-H. Kim (Eds.), *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. University of Chicago Press.

Klein, S. A., & Marghetis, T. (2017). Shaping experiment from the inside out: Performance-collaboration in the cognitive science lab. *Performance Matters, 3*(2), 16–40.

Langlitz, N. (2013). *Neuropsychedelia: The revival of hallucinogen research since the decade of the brain*. University of California Press.

Lysen, F. (2019). Kissing and staring in times of neuromania: The social brain in art-science experiments. In T. Pinch, H. Borgdorff, & P. Peters (Eds.), *Dialogues between artistic research and science & technology studies* (pp. 167–183). Routledge.

Mingler. (n.d.). Retrieved September 16, 2021, from https://mingler.network/

Niewöhner, J. (2016). Co-laborative anthropology: Crafting reflexivities experimentally. In J. Jouhki & T. Steel (Eds.), *Etnologinen tulkinta ja analyysi: Kohti avoimempaa tutkimusprosessia* (pp. 81–124). Ethnos. Reprint in English translation (pp. 1–27). https://edoc.hu-berlin.de/bitstream/handle/18452/19241/Niewoehner2016-Co-laborative-anthropology.pdf?sequence=1&isAllowed=y

Read, M. (2011, April 11). *How to use magnets to mess up your brain*. Gawker. https://www.gawker.com/5791070/how-to-use-magnets-to-mess-up-your-brain

Regulations for Mingler Scholarship. (n.d.). https://akademievankunsten.nl/

Roepstorff, A. (2001). Brains in scanners: An Umwelt of cognitive neuroscience. *Semiotica, 2001*(134).

Rogers, H. S., & Halpern, M. K. (2021, forthcoming). Introduction: The past, present, and future of art, science, and technology studies. In H. S. Rogers, M. K. Halpern, D. Hannah, & K. de Ridder-Vignone (Eds.), *Routledge handbook of art, science, and technology studies* (n.p.) Routledge.

Rose, S., & Rose, H. (2016). *Can neuroscience change our minds?*. Wiley-Blackwell.

Salter, C., Burri, R. V., & Dumit, J. (2016). Art, design, performance. In U. Felt, R. Fouché, C. A. Miller, & L. Smith-Doerr (Eds.), *The handbook of science and technology studies* (pp. 139–168). MIT Press.

Slaby, J., & Choudhury, S. (2017). Proposal for a critical neuroscience. In M. Meloni, J. Cromby, D. Fitzgerald, & S. Lloyd (Eds.), *The Palgrave handbook of biology and society* (pp. 341–370). Palgrave Macmillan.

The Editors of Nature. (2021). Collaborations with artists go beyond communicating the science. *Nature, 590*(7847), 528–528. https://doi.org/10.1038/d41586-021-00469-2

Van Lente, H. (2000). Forceful futures: From promise to requirement. In N. Brown, B. Rappert, & A. Webster (Eds.), *Contested futures: A sociology of prospective techno-science* (pp. 43–63). Ashgate.

Wisnioski, M., & Zacharias, K. (2014, May 15). Sandbox infrastructure: Field notes from the arts research boom. *ARPA Journal*. http://www.arpajournal.net/we-are-test-subjects-2/