The Body Politics of Data

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THE BODY POLITICS OF DATA

PhD Thesis

Creative Media

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ABSTRACT

The PhD project *The Body Politics of Data* is an artistic, practice-based study exploring how feminist methodologies can create new ways to conceptualise digital embodiment within the field of art and technology. As a field of practice highly influenced by scientific and technical methodologies, the discursive and artistic tools for examining data as a social concern are limited. The research draws on performance art from the 60s, cyberfeminist practice, Object Oriented Feminism and intersectional perspectives on data to conceive of new models of practice that can account for the body political operations of extractive big data technologies and Artificial Intelligence. The research is created through a body of individual and collective experimental artistic projects featured in the solo exhibition *The Body Politics of Data* at London Gallery West (2020). It includes work on maternity data and predictive products in relation to reproductive health in the UK, created in collaboration with Loes Bogers (2016-2017), workshops on "bodily bureaucracies" with Autonomous Tech Fetish (2013-2016) and *Accumulative Care,* a feminist model of care for labouring in the age of extractive digital technologies. This research offers an embodied feminist methodology for artistic practice to become investigative of how processes of digitalisation have adverse individual and collective effects in order to identify and resist the forms of personal and collective risk emerging with data driven technologies.

DECLARATION

I, Alexandra Sofie Jønsson declare that I declare that all the material contained in this PhD thesis entitled "*The Body Politics of Data"* is my own work.

Westminster University Centre for Research and Education in Art and Media

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Yours Truly,

Alexandra

TABLE OF CONTENTS

TABLE OF FIGURES

CHAPTER 1

INTRODUCTION

"We Won't Play Nature to Your Culture"

When I had my baby, I received a bill in the post. The German Department for Health Insurance had soon enough issued me with an itemised list of the cost of my child's birth because they did not want to pay for it. The crowning moment, when the obstetrician rushed into the birthing suite, grabbed a pair of scissors, cut the vaginal opening, interjected the *ventouse* and helped my baby out, circulated the health database as a bit of data and ended up as a bill in my post box with the cost code 7010060C. Listed at the price of €1693.41, the cost data extended my body administratively, bouncing the unpaid experience between collections departments in Germany and the UK in hope of a down payment for the birth. These experiences were the raw matter of the data, but at the time, I was not prepared to think of them as such.

When I had my baby, I shared so many of his first moments on the Internet. His first long nap, grandma's first visit, selfies with siblings, the first big smile, bath times, park trips, winter nights, breastfeeding struggles and even pictures of the exhausted mum.

Figure 1. Landu Jönsson, *Untitled* (portrait of sleeping parent), digital photograph, 2014.

However, it was only seconds before these precious moments, smiles and giggles had been crunched by invisible yet omnipotent predatory marketing machines. My antenatal Facebook wall moved in the parallel rhythms of baby pictures and shifting advertisement panels on the right side of the screen. Baby formula, sleep training books, breastfeeding pads and strollers along with thousands of other products that were directed to me because of the computation of my social media data.

When I had my baby, I also felt down. The violent experience of childbirth, a changing body, dwindling friendships, lack of sleep and lost words made me turn to Google for advice, but I did not even get to finish my sentence before the data spoke back to me.

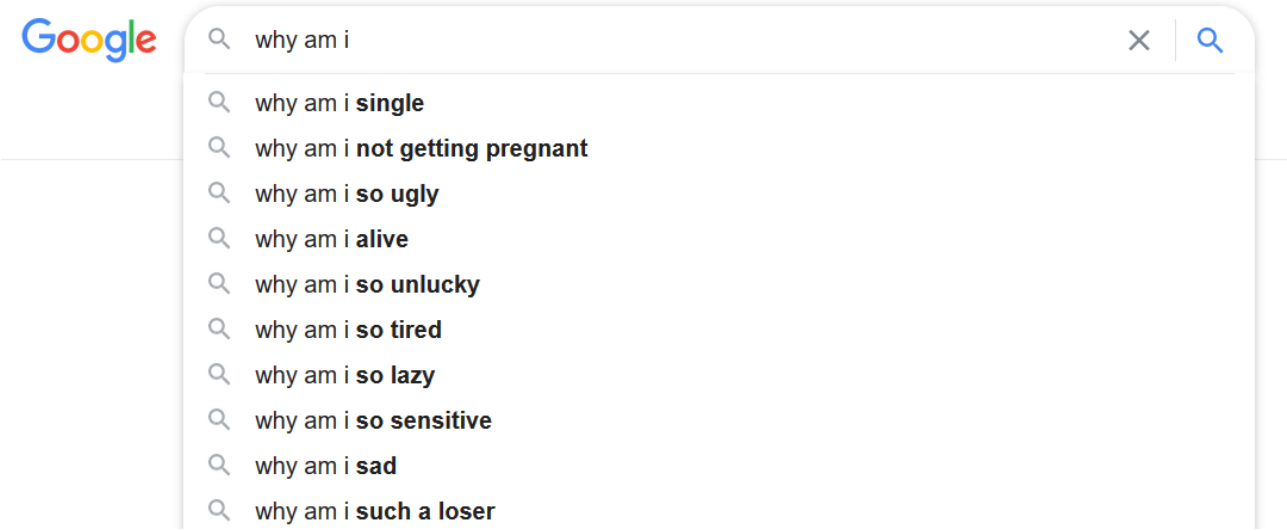


Figure 2. Alexandra Jönsson, *Screenshot* (Google search engine prediction), digital image, 2014.

Google alone made 110.8 billion US dollars in revenue in 2018, putting Big Data and analytics ahead of the global software market, which is predicted to be worth 628 bill US dollars in revenue (Columbus 2018). It is estimated that by 2020, the world will have generated, imitated and consumed forty Zettabytes (*or forty trillion gigabytes*) of data (Sivarajah et al. 2017), which will be facilitated by the expansion of large-scale data collection schemes to capture user generated content, experiences and transactions for the production of Artificial Intelligence (AI). Google's algorithmic anticipation of my state of mind, reveals how bodies, feelings and experiences are extracted, recomposed and presented back to us as commercially predefined and yet always a changing state of mind.

The artistic research takes as a starting point my reproductive experiences of data both in the context of maternity services and online social media platforms. While seeming disparate, the context of public healthcare and tech corporations are increasingly becoming entangled as public services are adapting *big data* analytics and increasingly framing data as an investment opportunity for economic growth. In both settings data operations are extractive. In healthcare, data is extracted for the purpose of governance processes, and in corporate tech, data is captured for the growing industry of predictive technologies. The research explores how artistic practice can become investigative of individual and collective concerns arising from how data is produced, captured and used through locating data producing processes and actions within the context of everyday life.

In the *Contextual Review,* I explore how the contemporary relevance of data has been defined across cultural studies, sociology, media studies and feminist theory, and how notions of media specificity and novelty have come to define artistic work on body/data relations in the field of art and technology.

> The new availability of huge amounts of data, along with the statistical tools to crunch these numbers, offers a whole new way of understanding the world. Correlation supersedes causation, and science can advance even without coherent models, unified theories, or really any mechanistic explanation at all (Anderson 2008).

Chris Andersons's statement reflects on how the digital discourse often frames data technologies with commercial and military origins as instruments of universal and objective knowledge, specifically situating data as disembodied. Even when artists position themselves critically in relation to how new technologies deploy the power of the institutions and corporations they are set up to serve (Paglen 2016), the dichotomies of object/subject and body/technology are reinforced because technical methodologies dominate how data has been imagined artistically.

In the research I take action to explore how data is embodied in practice, in turn defining a more-than flesh body. After the birth, the paperwork is prepared, and the midwife enters the crowning costs into the healthcare database, marking its journey away from my body, stretching it into the administrative networks of information. As data, the experience of the crowning moment has now been formally claimed as the digital property of the public healthcare database, which will come to define its future usages and applications. Taking disembodied data for granted, either raw or clean, means that it has already been obtained and that the context from where it was made is erased and the bodies who laboured for it to exist are disappeared from view.

In search of conceptual tools that would allow me to piece back my body to its data, I looked at how the relation between bodies and technologies had been addressed within feminist theory and practice. Already in the 90s, Katherine Hayles asked: "how much had to be erased to arrive at such abstractions as bodiless information?" (Hayles, 1999, 12). The a priori separation of the subject/object that places the operations of technologies in a separate epistemological and material field to the life of gendered bodies was rejected by feminist thinkers who saw it as a move to expand and mobilise new sexualized forms of dominations, a sentiment also embodied in the title of Barbara Kruger's artwork *Untitled (We won't Play Nature to Your Culture)* (1983). With the rise of big data analytics and AI, the universalising claims made on their behalf have been challenged by feminists practitioners who call for the historical and material context of data to be referenced (Behar 2016; Ignazio and Klein 2019; Crawford 2013; 2016; Apprich et al. 2018). When Lisa Blackman argues, "we are far from being merely molecular bodies that can be reduced to code and information" (Blackman 2008, 117), practically speaking, we never will. Even from a technical point of view, code, data, databases, data collection, design, hardware, plastics, microchip metals, electricity and storage locations require material form. These material forms equally require labour to exist in practice: from

users inputting data to online workers operating along with algorithms to sort, edit and clean data, workers who train artificial intelligences and those who work on the assembly lines of hardware factories, in metal processes and mining and in e-waste maintenance and recycling. The closer we move to the raw sources of data, the closer we come to its embodied form.

But as argued by John Wood in the anthology the *The Virtual Embodied,* there was no point in

> […] privileging bodily presence in the static sense would be problematic if it were to reinforce the infamous mind and body dualism that has dogged the Western mindset for several centuries (1998, 1).

He instead suggests that we look at the relationship between bodies and technologies from a perspective of practice to explore the body as more than a concrete noun, "… and when we talk speak of 'embodying' information, we try to emphasise action and practice" (Wood 1998, 1). The question of how we "do" data with bodies in the context of everyday life resonates with the starting point of my research to understand how the increasing demand for producing and accumulating data affects the very bodies that labour as a part of the broader digital economy. If data produced from the taps of the fingers travels to become profit, or a part of that body circulates commercial and government databases, when does the body begin and end? By following the practices of how data is made, it becomes impossible to define human bodies and technical machines as separate entities. In practice, they come together as a process in which the movements of the machines reverberate through the mental and physiological body, and the movements of bodies extend through the movement of data in electronic network and databases.

The research questions frame the potential contributions that feminist artistic practice present to the field of art and technology in terms of examining the digital from an embodied perspective. In order to identify the potential risks of computational culture, data must be understood as experienced,

considering “experienced” as materially, technically and socially produced, in order locate and resist the potential challenges of an increasing demand for data that the digital operation continues to require.

1. How can feminist methodologies of *lived experience*, *care* and *maintenance* shift the focus of artistic practice in the field of art and technology from technical and economic definitions of big data to an ecological view of data as being socially and materially embodied?
2. How do concepts such as the *labouring body* allow for a new situated understanding of what counts as a body in the context of computational culture, as it allows for a focus on *becoming* across human and non-human materialities?
3. Framing data as a social and bodily concern, how can the artistic practice investigate the potential risks of processes of digitalisation?

In the *Conceptual Framework,* I contextualise how I take an *ecological* approach to data in my artistic practice to situate concepts of big data and predictive products within the context of bodies. The ecological view of data enables the artistic practices to address the ways that big data is already bodily when considered from the perspective of its subjects and workers across material, administrative and political ecologies. By framing the body *affectively*, movement becomes decisive in exploring the body as a process of *becoming* in relation to its politically organised social and material environments (Featherstone 2006; Blackman 2014; Ahmed 2004; Rai 2019; 2015). From the perspective of the material ecology of data and its workers, one might slightly rephrase Hayles’ question, "how much had to be erased to arrive at such abstractions as bodiless information?" (Hayles, 1999, 12), to *how many bodies* have been erased to arrive at such abstractions?

In the chapter *Methodology and Methods,* I develop the conceptual and artistic approaches that I take to explore the digital as a social and bodily concern. I discuss the use of feminist methodologies such as *lived experience, collaborative practices,* and *performative strategies* to contextualise the

artistic process as investigation rather than as a site of aesthetic production. Taking both drawing and collage strategies to visually conceptualise the relation between data and bodies, the mapping methodology explores the movements between bodies and the larger data processing systems that extend the body beyond its material site and that settle within the movements and postures of bodies. By adapting a view of the *working* processes of labouring data, I appropriate these processes as performative strategies to frame how movements of data are defined by the specific the scales, rhythms and speeds of computation.

The practice consists of a collection of individual and collaborative artistic projects, including a series of public workshops exploring the "bodily bureaucracies of data" with Autonomous Tech Fetish (ATF), and artist Cliff Hammett, hosted by the Common House (2013-2016); explorations of maternity data and predictive healthcare products created in collaboration with artist and maker Loes Bogers; and a body of experiments in feminist care practice for labouring in the age of extractive digital technologies. The practice based research is organised in four perspectives, *Movement, Capture, Labour* and *Care*, which the research considers in the process of exploring data as a social and bodily concern.

In the chapter *Movement,* I examine how data requires movement to exist, and how such movements of bodies, transactions, between systems, corporations and offices, network the relations that come to make up the bodily relations of data. These relations are marked by the extraction that is imperative of data (Zuboff 2019); there is an ongoing demand for bodies to produce data, but the value of such labour is erased in the conceptualisation of the digital product. In the drawing experiments *Life Drawing the Attention Theft* and *Cleaning & Scrolling,* I explore how the economic

interest of corporations are grounded within the body as site, positioning digital labour as a new form of invisible labour.

In the chapter *Capture*, I explore how the body politics of data must be understood in direct relation to the processes through which bodies are digitalised. Through a collection of experiments looking at the production and use of healthcare data, the artistic practice explores the need for a body specific approach to contextualising data as a social concern. The experiments *Welcome to the Maternity Ward, Allocation of Reproductive Responsibilities* and *Top Ten* show how data entry processes and infrastructures come to define how the body is extended administratively, producing new processes for the organisation of antenatal and birth care that equally frames the reproductive body in terms of its data. The increasing interest to use public data for the development of new digital products for healthcare governance, such as cost predictions and optimisation measures of care expenditure, is addressed in the maternity ward intervention, *The National Catalogue of Savings Opportunities,* demonstrating how extending the body into commercial public databases makes it a target of financial interest. The shared experience of extractive data technologies in public domains as well as on corporate platforms points to economic movements that appropriate reproductive labour.

In the chapter *Labour,* I discuss how the project *Data Collage* becomes a steppingstone for exploring the embodiment of data beyond the individualised notion of user-interaction between subject and database or consumer and product. The project highlights the economic and material conditions that frame experiences of work within big data factories, from cam sex workers, influencers, commercial content moderators and the rise in precarious forms of contracted data entry work to call centres, search engine rating, click-work and image coding jobs. In the final chapter, *Care*, I discuss the making of a feminist practice of care, addressing how the content, scale, size and pace of extractive

computational labour settles within the body as site. In a series of *Repair Maps* of workers' bodies and the associated installation, *Accumulative Care,* I address how situating data ecologically resists techno-deterministic notions of data and provides a new bodily epistemology for taking stock of the digital.

In the chapter *Discussion: Embodying Risk,* I summarise how approaching data from a point of practice, how it is made, and the bodily effects of labouring data contribute new body specific epistemologies to assess the production of digital risks. By locating the digital in everyday contexts, the risk of surveillance machines can be located within specific social and material sites, instead of in the abstract imagination of omnipotent data processing operations. In the *Conclusion,* I summarise the outcomes of intervening into the field of art and technology with a feminist body of work. The ecological approach shows that data requires context, labour and material to exist, which offers a new starting point for art and technology practices to explore the digital. The artistic body of work positions data as a social concern and shows that extractive data operations are themselves bodily through the way that they classify and reproduce bodies in the image of their own terminology. By introducing feminist strategies of maintenance and care, the menial and repetitive bodily processes through which data is laboured can be recuperated as a site of value within the artistic imagination, expanding how the body specific politics of data materialise through the fabric of everyday life.

CHAPTER 2

CONTEXTUAL REVIEW

The contextual review covers an introduction to the terminology of *big data* drawing on scholarship from the fields of media studies, sociology, critical software studies, digital humanities and cultural studies. The work of cultural theorists on big data and AI. Lisa Gitelman's (2013), danah boyd's and Kate Crawford's cultural readings of data (2012; 2014; 2016); Rob Kitchin's account of big data infrastructures and their societal implications (2014); Wendy Hui Kyong Chun, Hito Steyerl, Florian Cramer and Clemens Apprich's work on pattern discrimination (2018); Safiya Noble's examination of racist algorithms (2018) and Cathy O'Neil's, Catherine D'Ignazio's and Lauren F. Klein's work on feminist data (O'Neil 2016; C. D'Ignazio and Klein 2020) all offer ways to conceptualise cultural and technical forms of power within the same framework. They go beyond defining big data as a technical and financial resource by examining the concepts used to develop data technologies and their social implementations. Within the field of art and technology, and more specifically within new media art, artists have, during the last four decades, explored a relationship between data and visuality, fostering a strong tradition for experimenting with new technical methodologies for the purpose of artmaking.[1] This allows artistic practice to give an account of the relationship between human perception and machine scale by rendering visible data processes unseeable to the human eye, as seen in media arts practices such as Natalie Jeremijenko's *Live Wire* (1990) where the artist physicalises Internet traffic data in a dangling wire, in Tom Corby and Gavin Baily's *Cyclone* (2005), a data-driven visualisation that contrasts cultural traditions of landscape with environmental realities, and in Ryoji Ikeda's large scale monochrome installation *Datametrics* (2012), which visualises the inner workings of hardware systems. Within the field of art and technology, however, the support of

[1] I refer to the field of "art and technology" practices sustained and influenced by the institutional framework, commissioning patterns and discourses of major festivals such as Ars Electronica (AT), Transmediale (DE), ISEA International (NL) and smaller institutions in the UK such as FACT (Liverpool), Abandon Normal Devices (AND), Space Studios.

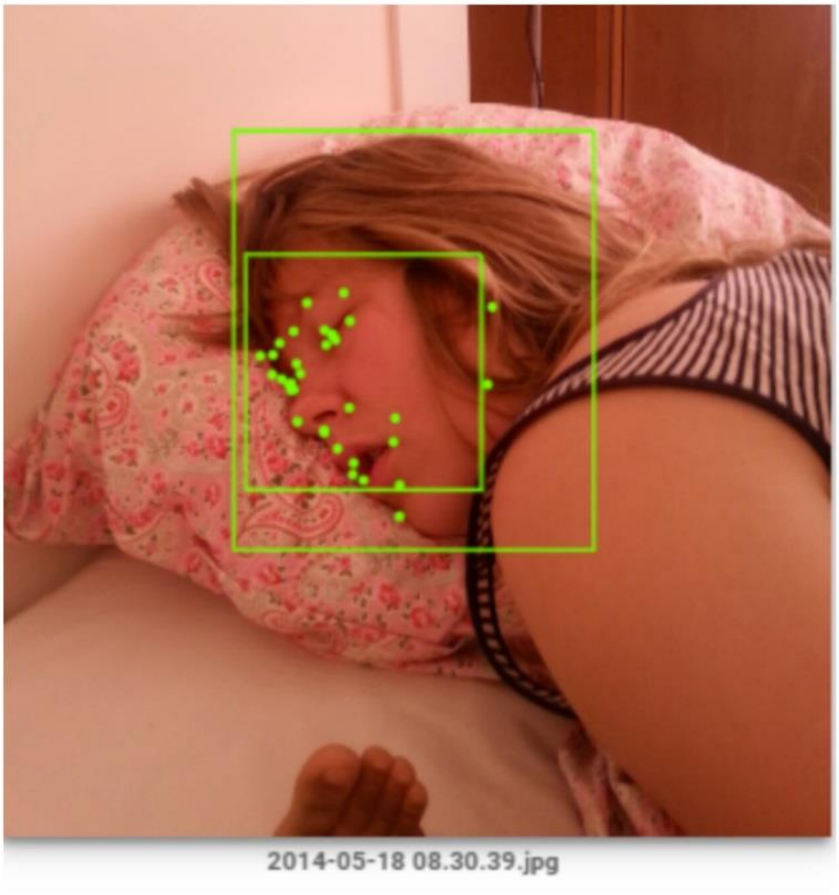
artworks that take a technical approach has dominated the discourse, and in turn, this has marginalised artistic practices that validate the social and material context of data. I discuss this shortfall by examining how the notions of *novelty* and *media specificity* became driving forces for the conceptualising, commissioning and showcasing of artistic practices within the art and technology field. I equally explore the rise in politically oriented *critical practices* and draw on earlier artistic approaches, such as cyberfeminist art, labour aesthetics and performance art practices, to point to other potential historical frames for the field of art and technology.

Big Data

Hailed as the new oil, the financial prosperity of data has been at the fore of the big data discourse, however, sociologists, data scientists and cultural theorists have in the past decade taken an increasing interest in the social and political role that data practices play in the organisation of contemporary society. In Latin, data means "what is given," but technically speaking, data is a collection of zeros and ones, also known as binary data, which can be processed, saved and stored by computers. Data is collected from numerous sources from everyday life through software enabled technologies that captures experiences, images, relations, communication patterns, dating experiences, traffic, weather, air compositions, financial markets and manufacturing processes. In short, data is all around us and the term is often used in a generalist way to describe the production of data from bodies, processes and things. In my research, I specifically examine the relation between data and bodies by drawing into view its specific technical, cultural and material contexts.

The image *Raw Resource* (2014) is a portrait of me sleeping, taken by my toddler child rummaging around in the early hours of the morning. When I woke up and found the image, I uploaded it to my computer and parsed it through Google Vision, an industrial image recognition software. The

software is a pretrained machine learning model that codes and classifies images and subsequently offers a set of analytical results drawn from its formal properties such as size, colour palette and composition or from its informational qualities such as embedded code, time and location. The software also classifies the person in the image and its actions. When I look at the image, to me, it portrays a very mundane situation of a person sleeping. However, when the algorithm "sees" the image, it codes it as "racy and adult" and relates it to web entities such as "panties, blonde and close up." We can use this image to understand some of the complexities of how bodies gain new meanings in the context of big data. The result is not surprising, but it points to how sexualised content make up a large part of the data that such algorithms are trained on. It is, in this way, predefined by what the model can "see" and therefore output and, in this case, the maternal body can only be "seen" with the language of the Internet as a sex object. Similar to Google Vision, Facebook's *DeepFace* image recognition software is trained on users' images; Amazon's marketing algorithms are trained on shoppers' data; and Googles scroll tracking software is developed by monitoring how people use their search engines. The value of people's actions in data must be seen in terms of how such data is used for building new commercial technologies marketed to businesses in the form of algorithmic advertisement.



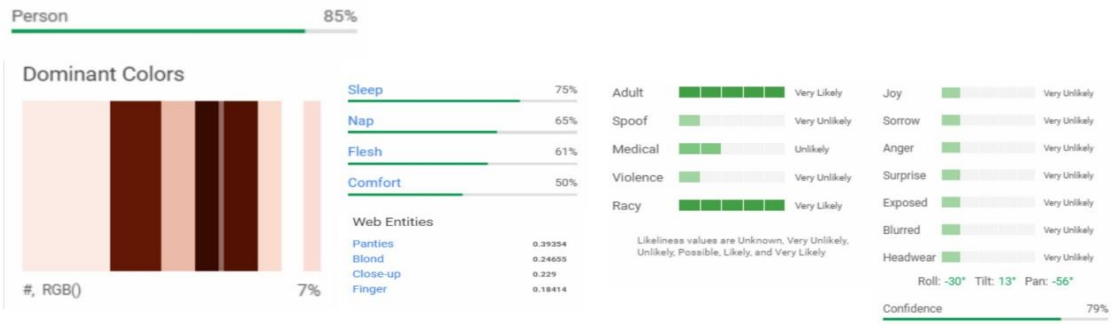


Figure 3. Alexandra and Landu Jönsson, *Raw Resource* (digital portrait of sleeping parent, analysed by Google Vision), screenshot, 2014.

The relationship between bodies and their data, however, are often understood representatively as body-data, such as medical data that represent the health and social status of a person, or as social media data that captures the opinions, behaviours, actions and experiences of people. This perspective comes from a technical understanding of how data is captured from bodies. The founder of the dating app OkCupid describes the process of datafication as a "chop and jam the continuum of human experience into little buckets 1,2,3"(Rudder 2017, 13). In order to quantify the business of making big data out of love, the *hows* of people doing love have to be quantified into bits that a server can handle and

> [at] the same time, you are trying to retrain as much of the *je ne sais quoi* of the thing as you can, so the users believe what you're offering represents real life. It's a delicate illusion, the Internet; imagine a carrot sliced so cleanly that the pieces stay there in place on the cutting board, still in the shape of a carrot (Rudder 2017, 13).

The carrot's pieces are the discrete and intelligible data (each datum is individual, separate and separable and clearly defined), which become the building blocks of how a person comes to be quantifiable. This has also been described differently as the *data double,* which is created by

> […] abstracting human bodies from their territorial settings and separating them into a series of discrete flows. These flows are then reassembled into distinct "data doubles" which can be scrutinized and targeted for intervention (Haggerty, et. al 2000, 606).

The computational processes of datafication in which a person's data (ID data, body data, user data, healthcare data etc.) can be built into an aggregate data and be endlessly reworked is often the focus of how data is understood. The development in both data collection devices and software, database technologies and analytics have enabled the data industry to grow rapidly over the past decade, providing businesses and governments new computational processes. Kitchin explains that

> Data has a strong utility and high value because they provide key input to the various modes of analysis that individuals, institutions, businesses and science employ in order to understand and explain the world we live in, which in turn are used to create innovations, products, policies and knowledge that shape how people live their lives (2014, 1).

Data driven methodologies are increasingly applied to areas such as surveillance, smart policing, crime modelling, disease modelling and precision health, which will enhance the economic and political value of data (Mayer-Schönberger and Cukier 2013). The demand for data is inherently tied to new forms of capitalism, which has been termed as *platform capitalism* by Nick Srnicek, where tech corporations supply the soft and hardware platforms for others operate through (2017) or called *surveillance capitalism* by Shoshana Zuboff (2019), who details how the rise of ubiquitous computing has enabled data to become a fundamental resource in the production of surveillance products. However, for some, the promise of big data outshines the risks:

> Out with every theory of human behaviour, from linguistics to sociology. Forget taxonomy, ontology and psychology. Who knows why people do what they do? The point is they do it, and we can track and measure it with unprecedented fidelity. With enough data, the numbers speak for themselves (Anderson 2008).

Chris Andersen's statement presents a sentiment in the big data discourse in which more data is always better, leading to greater accuracy and truth. Kate Crawford argues that this leads to a "epistemological position [that] is so seductive that many industries, from advertising to automobile manufacturing, are repositioning themselves for massive data gathering"(Crawford 2014). The focus of economic and technical discourses on data as a product in a growing industry limits the potential of these accounts for critically considering the material and cultural contexts of data, including

people's lived experience of it. However, a growing body of *critical data* literature gives a more comprehensive account of how data is socially situated.

Critical Data Theories

Crawford and boyd seeded in their article "Critical Questions for Big Data" the beginning of critical data studies as they wrote:

> Diverse groups argue about the potential benefits and costs of analysing genetic sequences, social media interactions, health records, phone logs, government records and other digital traces left by people. Significant questions emerge. Will large-scale search data help us create better tools, services and public goods? Or will it usher in a new wave of privacy incursions and invasive marketing? Will data analytics help us understand online communities and political movements? Or will it be used to track protesters and suppress speech? (2012)

These concerns are at the centre of a growing body of academic work shifting the discourse of data from its neutral scientific and commercial context to the culturally malleable world in order to address its social implications. Kathy O'Neil's book *Weapons of Math Destruction* (2016) provides an account of algorithms as actors within the capitalist economy. She argues that while university ranking tables, teacher performance tables and investment funds are gaining new computational form, the algorithmic bias orienting the outcomes towards profit production rather than accountability is rarely addressed.

> Big Data processes codify the past. They do not invent the future. Doing that requires moral imagination, and that's something only humans can provide. We have to explicitly embed better values into our algorithms, creating Big Data models that follow our ethical lead. Sometimes that will mean putting fairness ahead of profit (O'Neil 2016).

Crawford, boyd and O'Neil call for data to be theorised critically beyond a techno-deterministic framework so that *how* data is used and for whose benefit can be examined. Gitelman suggests to

retheorise data as a culturally produced matter to challenge the perception that data is "raw" or in nature "pre-analytical" and to show that data does not simply exist, it has to be produced.

> Data too needs to be understood as framed and framing; understood, that is, according to the uses to which they are and can be put. Indeed, the seemingly indispensable misconception that data is ever raw seems to be one way in which data is forever contextualised, that is framed, according to a mythology of their own supposed de-contexualisation (Gitelman 2013, 6).

Kitchin also goes to the definitional framework to address the problems of defining data as a pre-given neutral entity because it does not allow us to understand it as something produced under specific cultural, technical and practical processes.[2] Tania Bucher more specifically examines *algorithmic sociality* by exploring how proprietary technical platforms are entangled with people's everyday social lives, challenging the monopoly that technical sciences have had on theorising algorithms (Bucher 2018). More specifically examining how big data puts women's lives at a disadvantage, D'Ignazio and Klein take an intersectional feminist approach exploring the relationship between gender, race and data in the book *Data Feminism* (2020), which is the first broad study with a feminist perspective on big data. As a counter perspective to big data, they address what it means to be *outside* of data capture, for instance, in the United States (US), where a high number of maternal deaths goes unexplained due to the lack of data. This is also the focus of Caroline Criado Perez's book on the gender bias in data, in which she shows that data is almost always less sufficiently collected and used when it concerns women. For instance, the Department of Transport in the United Kingdom (UK) has an ample amount of data showing that 62% of women feel unsafe in multi-story carparks and the Department for Work and Pensions has access to comprehensible gender pay gap

[2] Kitchin shifts this focus by terming data through the process of "capta" (derived from the Latin *capere*, meaning "to take," referring to what has been taken (measured, collected, captured) rather than the Latin meaning of the world, *given* (Kitchin 2014, 2–4).

data, and yet there has been no practical implementation to alleviate these problems (Criado-Perez 2019). The risks associated with living "data-less" lives are also addressed by Shoshana Magnet, who theorises that information practices are enablers for the access to public services, welfare and citizenship in western societies. Without the right kind of data, you might not exist, bureaucratically speaking, as such, the needs of individuals, their access to public services, housing, credit and support can be limited or the needs of specific groups of people can become erased in societies that solely rely on the production of data as evidence (Baggiarini 2013). Virginia Eubank focuses on how families who rely on welfare services are particularly affected by forms of *machine intelligence* in the push to automate welfare payments, food stamps and housing in the US, arguing that the most punitive automated systems are aimed at the very poor in society (Eubanks 2018). Candice Lanius suggests that the production of data as evidence should be understood as a technology of mistrust in her article "Fact Check: Your Demand for Statistical Proof is Racist," arguing that statistics was invented and used predominantly by the educated elite to "discuss the lower classes and subaltern populations" and in turn rendering particular individuals "unknowable and untrustworthy of delivering their own accounts of their daily life"(Lanius 2015). And she also asks, what does that look like in practical terms?

> A white woman can say that a neighbourhood is "sketchy" and most people will smile and nod. She felt unsafe, and we automatically trust her opinion. A black man can tell the world that every day he lives in fear of the police, and suddenly everyone demands statistical evidence to prove that his life experience is real. Statistical proof is blatant distrust of someone's lived experience (2015).

As highlighted by O'Neil, algorithms are only as good as the data which they are built on, which is also a theme in Noble's book *Algorithms of Oppression* (2018) where she examines how derogatory stereotypes about Black and Latina women are perpetuated by search engine algorithms such as

Google, which returns a number of offensive and pornographic images simply from the search query "black girl." In the book *Pattern Discrimination* (Apprich et al. 2018)**,** Chun, Steyerl, Cramer and Apprich explore the history of sorting algorithms, which Chun argues were conceptualised through the term *homophily* in a 1950s study of friendship patterns and social segregation.[3] She found the basis of how online networks are trained based on *homophily* to show that sorting algorithms themselves propagate ideas of virtual segregation because they exclusively reinforce similarities in networks (only connecting people who are alike) rather than building bridges between communities (Apprich et al. 2018, 59–99). Chun goes on to argue that the concept of *homophily* is driving the sorting of data in both commercial marketing and across public institutions; for example, in the Chicago police department, who model murder data to identify which citizen is most likely to murder or be murdered or how "software used by some US courts to predict recidivism—and thus determine sentencing and parole—has been shown to be biased against African Americans"(Chun, 2017). These accounts show that both to be a part of the data and to be missing from the data has different kinds of risks for individuals. Some of these risks are associated with the white man, as argues Crawford in her article "Artificial Intelligence's White Guy Problem," because the design and engineering of such biases have more to do with the people behind the technologies rather than the technologies themselves:

> Sexism, racism and other forms of discrimination are being built into the machine-learning algorithms that underlie the technology behind many "intelligent" systems that shape how we are categorized and advertised to (2016).

[3] Chun uses Paul Lazarsfeld and Robert K Merton's term of homophily which the authors coined in a study of friendship patterns from two communities in the US. They found that homophily was not "naturally" present, positioning homophily as a problem related to heterophily in segregated communities. Chun argues that we are virtually more segregated than ever. With polarising social media algorithms that enforce the views that are growing in social media networks, the sorting algorithms are designed to use homophily as a solution rather than a problem to solve.

This is happening, she argues, because the current loudest voices in the debate on big data and AI are white middleclass men, merely reflecting the wider gender gap in Silicon Valley and the STEM sector (Misa 2010; Henn 2014). These accounts reveal how technologies, intentionally or unintentionally, exclude certain bodies from using them while others are targeted by design. The critical insights about the social implications of how computational culture is lived, as well as a critical reading of the assumed neutrality of big data narratives produced by the academic work discussed, reveal that the group of people that big data is designed to work for is often a minority.

For my research, this body of literature has been important to position my practice in relation to the existing critical work on computational culture, and more specifically, on data. It raises important social concerns and shows how some bodies are prioritised, fore fronted and others devalued in the ways that data is put to use. How decision-making bodies (often white and male) "disappear" from the discourses around data leaves new technologies to perpetuate the biases of the programmers, institutions or businesses who control the decision-making brings up important questions as to what is missing from the discourse of big data. The sociological studies putting *livelihood* and *lived experience* of big data, artificial intelligence and algorithms to the fore enriches the discursive space on digital society, which has otherwise been heavily dominated by accounts from engineers and computer scientists focusing on the development of the technology itself rather than its social context. The accounts provide different perspectives on data in society; some argue that we have to do better at collecting data more equally and train a more diverse work force, while others dismiss data driven governance altogether, arguing that its racist and misogynist foundation is set to reproduce itself.

While there is a move towards rethinking the specific relationships that are created between data and women's bodies, or data and communities of colour, how in practice these relationships

materialise are often left unanswered. The conceptualisation of bodies and data as separate material fields risks the reinforcement of an exclusively "human body" that belongs to the dichotomies of body/machine, subject/object and nature/culture. The constructions of these relations have been more directly addressed by investigative artistic practices in and around the field of art and technology, where artists have drawn on scale, size, temporality and action to examine the relations between digital matter and bodies.

New Media Art

In 1997, the world's first net art competition was held in Galerie der Gegenwart (Gallery of Contemporary Art) in Hamburger Kunsthalle, and over 200 female net artists submitted their work. However, despite the fact that more than two-thirds of the entries were from women, three men walked away with the cash prizes. Only after the competition ended, the artist Cornelia Sollfrank revealed that as a part of her artwork *Female Extension* (1997), she had flooded the gallery application system with more than 200 virtual female artists, whom she had given international identities, addresses, phone numbers and email addresses located on servers across the world. She had collaborated with other artists to create a piece of software that would generate net art for the virtual applicants (Sollfrank 1997). Almost twenty years later, in 2015, a group of artists launched the campaign #KissMyArs to challenge the gender bias in the world's largest art and technology competition, the Ars Electronica festival. Like many other artists who are also women, the established artist Heather Dewey-Hagborg received an honorary mention, not a cash prize, for her artwork *Stranger Vision* (2015). This is because Ars Electronica have awarded nine out of the ten prizes (which is represented by a golden statue of a beheaded, naked woman) to men in the last twenty-nine years.[4] Amongst others, Dewey-Hagborg felt it was time to raise the underlying issue:

> My participation in this campaign stemmed from a frustration that this highly esteemed prize was one designed for men, and others need not apply. As women in art and tech we are consistently under-recognised, under-funded and written out of history. We are made to feel that our work must simply not be as good as that of our male peers, and if only we made *better work,* we would attain the same accolades and

[4] It seems that Ars Electronic has in some ways responded to the critique with a rise of events addressing the issues such as the one-day event *Women in Media Arts* (2020), the *Women in Media Arts Database* (2019) by Elena Robles Mate and a series of blogposts on their website such as *Women in Media Arts: Does AI think like a (white) man?* (Grubauer 2020).

> accomplishments as they did. Last year I finally realised that this was bullshit (2016).

Even though Sollfrank's *Female Extension* already challenged in the 90s the unconscious gender bias of the emerging field of new media art, this field of practice has continued to prioritise the reproduction of its own status quo rather than critically examining its own premises. Sollfrank's artwork suggests, like many other cyberfeminist projects at the time, that bodies have to be defined beyond abstract terms of humanity, as both technically and materially situated. Only by addressing gender directly, how cultural institutions are biased in their commissioning, showcasing or funding of artists can be openly addressed; and in turn, the unspoken rules for what counts as media arts can be debated in a transparent manner. Still today, such questions remain in the margin of new media art, which continues to be judged and defined with arbitrary notions of media specificity, novelty and production quality.

Media Specificity

Experiments in Art and Technology (E.A.T.) was a project launched in 1967 at the Bell Laboratories (US) with the vision to bring artists together with scientists and engineers to use computers, code, telephones and other new technologies for artmaking.[5] Today, work that explicitly explores such aesthetic agenda is often categorised as new media art, a subset field in the broader field of art and technology, which is both celebrated and criticised for its focus on technical media.[6] As described by

[5] EAT at the Bell Telephone Labs was formed by Billy Klüver, an engineer who collaborated with a range of artists and computer scientists such as Andy Warhol, Claude Shannon, Ken Knowlton, Leon Harmon, Lillian Schwartz, Charles Csuri, A. Michael Noll and Edward Zajec. Within a few years, the enthusiasm of art science collaborations died down and work of a technical nature was largely rejected by the mainstream world of contemporary art.

[6] The curation of art and technology practices by major yearly festivals such as Ars Electronica Festival (1979) and Transmediale (1988), often mimic these antagonistic historical lineages: the technical dedication from the research labs and the critical and anti-art approaches from the early avant-garde.

Christiane Paul, the "lowest common denominator for defining new media art seems to be that it is computational and based on algorithms"(Paul 2008, 3). Dominico Quaranta argues that the intensive focus on computational media specificity clashed with the directions of contemporary art already in the 70s, as artists had long rejected the formalist rules for art making surrounding sculpting, painting and drawing in favour of conceptual processes that allowed art to become a site for processing and critical questioning.[7]

> It would be easy to infer that New Media Art is based on a question of formalism. [...] On the one hand, since the 60s, art no longer focuses on the specific characteristics of a medium, but takes an open, nomadic approach. For art criticism, this makes New Media Art's claim to focus on the medium absurd, naïve and obsolete (Quaranta 2013, 31).

The narrow technical focus has been used to claim that new media art lacks content, referentiality and criticality (Quaranta 2013, 30), is labelled "technical art" (Bishop 2012) and has raised discussions about how new media artists should position themselves actively amongst other visual practitioners, such as information and graphic designers, scientists and economists who also work with new technologies for image making purposes (Manovich 2008). For artists, however the field of art and technology has created a unique opportunity to collaborate with engineers, programmers and scientists to explore new technical and scientific processes within the bounds of artistic practice. Equally, the art and science field has given space for the development of new processes and problems to be addressed by artists as well as offering new contexts for artistic engagement. The adaptation of scientific and computer technical practices is evident in the large body of work created with

[7] With the rise of new conceptual practices in contemporary art during the 60s, such as conceptual art, feminist art, situationism, interventions, performance art and happenings, the objectives for meaning making shifted to content. The artists changed the rules for art making and dissolved the boundaries between art and everyday life. However, it is worth remarking that the field of new media art does not have a commercial market under it in the same way as contemporary art, as such the artists are less affected by market pressures, and instead depends on research and institutional funding.

visualisation methodologies such as data visualisation, data physicalisation and code to produce interactive or screen-based representations of data in artworks. The aestheticising of these tools can be seen in artworks such as Ryoji Ikeda's *Datametrics* (2012), a representation of computational systems displaying rhythmic monochrome patterns of code generated from software and hard drive errors; Arron Koblin's data visualisation of twenty-four hour flight data turned into a sixty second video; or even older works such as Natalie Jeremijenko's *Live Wire* (1990), a wire that dangles according to the amount of internet traffic data. These artworks share the strategy to use data to mediate the inner workings of computational systems, *visualising* the infrastructural processes unseeable to the human eye. However, as asked by Lev Manovich (2008), how should artists' work on data differ from that of information and graphic designers, scientists and economists? In scientific contexts, data visualisation is often positioned as a tool to amplify human cognition (Mackinlay and Card 1999) through the visual mapping of information[8] and therefore serve as a knowledge tool to project the scale of computation into the context of human perception (Manovich 2003). These artistic strategies provide valid insight into how social life, the body and its processes can be represented by data and inform visual practices often framed by the much-used media terminology of Marshal McLuhan in which the medium is understood to be the message in such a way that technologies themselves, their scale, pace and operation, are seen as inclusive to the process of meaning making (McLuhan and Lapham 1994). New media artists' work can often be seen favourably within this frame, as producing work that tests, stretches and explores the material conditions, logics and limitations of new technologies, such as the Internet, databases and algorithms (Corby 2013).

[8] The translation of one form of data (numerical or textual) to another (image, animation, sound) is a mapping process in which one type of representation is mapped onto another, such as images into sounds, sounds into 3D, numbers into images, etc.

If artists take on concepts of disembodied information and specialist technical knowledge in their practice, will the artworks take on a similar representative role of revealing the empirical truth, instead of pointing to how such knowledge is produced with specific resources, practices, ideologies and processes?

How machines have historically been conceptualised as serving their humans as extensions that enhance the power of the individual cannot be removed from the conversation of how artists are increasingly introducing machines within their practices. However, the idea that AI and machine learning technologies are increasingly producing their own understanding of human life suggests that this dynamic is changing. Are bodies becoming extensions of big data machines? AI and machine learning have introduced a new way for artists to work with data, going beyond visualising data to explore how machines themselves see us. In the article "Invisible Images: Your Pictures Are Looking at You,"(2016) the artist Trevor Paglen points out how the regimes of *seeing* are shifting towards how machine intelligence as user generated content from social media platforms are accumulating vast amounts of data about people, their actions and whereabouts for the making of AIs. Machine agency is at the centre of a number of recent artworks, such as the first AI artwork to be sold at Christies, the *Portrait of Edmond de Belamy* by the collective Obvious, who trained a GAN (Generative Adversarial Network) on data from 15,000 historical portraits made between the sixteenth and the twenty-first centuries (Obvious 2018). The designer Mario Klingeman's project *The Butchers Son* (2017) uses a similar method to train a neural network with images of bodies, which he describes in an interview as a "neural network's interpretation of the human form" (Campbell-Dollaghan 2018). He goes on to explain that he trained the algorithm on porn data because it is a "[…] reliable and abundant source of data that shows people with their entire body […]"; and he adds, "[…] another source would have been sports imagery, but I must admit that am not really into sports […]"

(Campbell-Dollaghan 2018). The artist Hito Steyerl takes a more critical perspective on data in her two-piece work *Actual Reality* (2019) in which she uses housing and poverty data to produce the augmented reality (AR) application that visitors could download and use as a tour guide of the local area from the perspective of the data.[9] Jan Nikolai Nelles and Nora Al-Badri illegally scanned the stucco-coated limestone bust from the Egyptian Wing at the Neues Museum in Berlin for the artwork *Queen Nefertiti Hac*k and released the data from the bust for free public use. The artists themselves reproduced the bust and embedded it with an AI voice agent programmed to "speak" for all objects that have been stolen and colonised.

Both Steyerl's and Nelles and Al-Bradi's projects draw on the context of data to position their work. The *Actual Reality* app invites the viewer to experience housing and poverty data by physically moving through the sites that the data represents, and *Queen Nefertiti Hack* points to the legal and practical barriers to obtaining data from cultural objects that have been violently required through colonialisation. Without such a contextualisation that situates the dataset culturally and materially, the artworks would repeat the disembodied representations of a dataset and reproduce ideas on the technical spectacle that relies exclusively on novelty. To give an example, the work *Body Quake* by Art is Opensource (AOS) (2017) is a collaborative interactive performance exploring how to translate medical data for new audiences. In the performance, the artists map medical epilepsy data onto a naked female performer who relays the data to the audience using sensor technology so that the epilepsy data can be felt as vibrations. Here, the data has been taken from people suffering from epilepsy and represented it in a tactile format for participants to experience it, however, the context

[9] The exhibition uses AR and AI to explore the interjection of new social and ecological realities into the Serpentine gallery and the surrounding Kensington Gardens in London. The artist worked with local NGOs to collect inequality data, such as wealth and housing data, which is integrated into the AR app *Actual Reality* to reveal what the social reality following austerity in the area looks like. The artist includes testimonies from NGO's to reveal what the park looks like from the perspective of domestic workers.

of a person suffering and embodying this disease is erased in the performance. Klingeman's artwork *The Butchers Son* also focuses on the fact that he used a GAN to train a computer model that could paint an image of a "human body," however, the context from which he obtained the data remains completely out of sight in the work. The point of the artwork is "the intelligence"—what Klingeman describes as a "neural network's perception of the human form," which in and of it itself is, of course, a questionable concept because the model is trained on porn from the Internet. The decision to define the "human form" without critically considering the context of online porn, the actions the artists took to design and develop the process of modelling the data reinforces the idea that data is a free and neutral capitalist resource. The concept of media specificity as such comes with specific practices that reappear within the sites of artistic practice, if not being critically considered. This is seen with artistic practices that prioritise the *analysing* of data over its material context, reinforcing that the value of data evolves around new *knowledge* or even the new forms of *life* that it can generate. However, in the process of creating this perspective, the connections to the material, social or bodily costs of data is severed.

Novelty

Paul defines the adaptation of new technologies in artistic practice, such as big data, algorithms, and code, as a defining character of new media art if it is used to create a new visual form, but not if the technology is used to reproduce an existing visual form (Paul 2003). Scott Rettberg argues that artworks are often superficially theorised from the perspective of novelty, where the "most compelling aspects about them are their novelty, their very newness" and he continues,

> […] because our orientation is always forward towards the future, we are inclined toward a kind of myopia and reluctance to look at the new through the lens of the past. With this orientation, there is furthermore a danger of placing too high a value on novelty at the expense of other aesthetic and

> ideological criteria. We see this in new media art discourse again and again (2008).

The concept of novelty plays equally a role in how new technologies have been conceptualised as separate to bodies within artistic practice. The body has often been taken as a site to be enhanced or challenged with new digital technologies such as seen in the performance-based work of Klaus Obermaier's *Apparition* (2004) in which movement sensor technologies are introduced as co-creators of the performance or in the work of Huang Yi & Kuka *A duet of Human and Robot* (2014) in which the performer directly collaborates with a robot. Practices more specifically exploring data as extensions of the body, such as the earlier discussed *BodyQuake* by AOS, *Body Code*(2012) and *Proximity Cinema* (2013) by Tiffany Trenda bring to the fore how data enables a body to extend beyond its human flesh. In *Body Code* (2012), the artist's body literally turns into code as she wears a full body suit covered in QR codes, and in the performance *Proximity Cinema* (2013), the body is wrapped in screens and becomes the interface that the audience can interact with by taking selfies. In the three examples, the artists articulate the fluidity of the body's boundaries with new forms of mediation that hard and software have introduced in everyday life, however, the bodies themselves are not conceptualised to have a sense of the agency beyond wearing the technology. With the lack of contextualising the technologies within the taxing histories in which bodies themselves were the very resource of technical development, artistic practices run the risk of appropriating the technical processes as neutral tools.

In 1893, the French police officer Alphonse Bertillon used mugshots of inmates to develop a visual identification technology for profiling criminals through body measurements, efficiently creating a bipartite system where individual records of a body are modelled into a scale of other body measurements, this became the aggregate (Lovejoy, Paul, and Bulajić 2011). In the 1940s,

International Business Machines Corporation (IBM) developed their first data processing system, the generation and tabulation of punch cards based on the national census commissioned by the Nazis who used the IBM cataloguing system to process and manage the murdering of Jewish people during the Second World War (Black 2012; Fuchs 2014). In the 1970s, the Polaroid ID-2 camera was designed with a boost-button that allowed the camera to absorb 42% more light, exactly the amount needed to capture black people on camera. The cameras were widely used as identification technology to photograph people for the notorious passbooks used during the Apartheid for controlling the movement of Black South Africans (Smith 2013). The history of colour film showed that Shirley, a colour norm referencing card used as the standard for "normal skin colour" in photography labs, was based on a white woman's skin (Roth 2009), and it was not until one of Kodak's biggest clients, a furniture company, complained that their dark brown furniture series came out badly in print that the company changed how they calibrated their cameras (Smith 2013). How colour film was designed according to ingrained racial bias is not dissimilar to Google's recent image recognition algorithm that systematically identifies pictures of Black people as gorillas. Instead of addressing this problem, Google simply blocked the algorithm from identifying gorillas altogether (Vincent 2018). Racial bias is present across a number of current products, such as Amazon's new biometric technology *Rekognition,* which caused controversy as it "wrongly identified 28 members of the US Congress—a disproportionate amount of them people of colour—as police suspects from mugshots" (Dastin 2018); Apple's facial recognition software that failed to tell two Chinese women apart; or Nikon's camera software that identified an Asian person as blinking (Crawford 2016).

These stories tell us that there is a cost to novelty, and artistic practices that focus exclusively on technical experimentation to *enhance* the body as site miss how technologies themselves are already bodily. Looking at "new" technologies from the perspective of *use* and the material and bodily sites

through which such technologies were created reveals how privileges such as race and gender are ingrained in the very technologies themselves, how they mediate the world and possibly also in the orientation of the technical practices themselves.

In the field of art and technology, these questions are only occasionally raised by artists even though artistic practices within this field could beneficially conceptualise the context of technologies in direct relation to artistic and technical experimentation. This would enable artists who query political, historical and experiential aspects of computational culture to contribute more actively to the field of practice. When Hito Steyerl describes the current scene of art and technology as "all-male shows" and "mono-gender discussions," it might be a reflection on a wider cultural erasure of difference in the history, theory and exhibition of art and technology.[10] The lack of diversity has been directly addressed by Jenifer Chan in the article "Why Are There No Great Women Net Artists?"(2011) as she draws a connection to the concerns raised in Linda Nochlin's original 1971 article "Where Are There No Great Women Artists"(1989), which addresses the institutional barriers to women in the arts. Chan discusses the specific genre of net art, of which only a few cyberfeminist projects are considered to be a part. While the rise of the Internet had some positive implications for women gaining access to both artmaking technologies and distribution platforms, still today women are not represented equally in terms of commissioning and funding, which Chan suggests needs addressing curatorially: "This means consciously programming and including women whether or not they make work that fits within existing aesthetic sensibilities of what net art should look like"(2011). Equally, in the European and Western contexts of art and technology, Ben Valentine argues that QTWOC artists (Queer and

[10] Steyerl points to the important contributions from artists working on and against state organised surveillance such as Rabih Mroué, Lina Saneh, Raqs Media Collective, Heath Bunting (2008), Muntanda (1994) and The Government Awareness Project (2003).

Trans Women of Colour) face challenges to enter the scene because of the cultural dominance of white and Western definitions of what counts as media art, which creates an inaccessible and hostile environment for artists of colour (Valentine 2015). The problem with not questioning the different forms of cultural privilege within the institutions of art and technology is that the lack of diversity within the institution itself results in the continual support of a project that perpetuates directly or indirectly misogynist and racist biases. These historical and contemporary circumstances evidence the need to expand not only who gets funded and showcased but also for expanding the field of practice, to reflect on the lived experiences of new technologies alongside existing forms of technical experimentation.

Can the scope of practices in the field of new media go beyond novel artmaking technologies and representational strategies to include the material, social and bodily costs of their own production? Work that formulate such concerns can be found in the feminist artistic practices from the 60s.

Cyberfeminism

Broadly speaking, feminist thought between 1960-2000 pushed for new ways to understand the relation between gender, bodies, and emerging digital technologies. A lot of the work commonly categorised as cyberfeminist took on Internet technologies and code as artmaking forms during the 90s to explore the possibilities of networked identity and virtual bodies, while other feminist practices from the 60s and onwards were explicitly anti-technological because new technologies were seen as extensions of patriarchal structures entrenched with masculinist ideologies (Cutting Edge Group 1999, 14). While these different strands of feminist practice are often not considered together, I argue that they operate with similar concerns in regards to the body politics of computational culture

and, equally, offer counter methodologies to the representational methods that dominate the field of art and technology.

Cyberfeminist projects such as e-VNS Matrix (1991), also known as the guerrilla girls of the Internet, explored how to subvert the Internet and code technologies for their own means and pleasures. Other groups such as The Old Boys Network (International Cyberfeminist Alliance, 1998) and individual artists such as Victoria Vesna, Sollfrank, Nancy Paterson, Shu Lea Cheang and Lisa Jevbratt created spaces for addressing formations of power and gender-based oppression through exploring the potentials of the Internet as a tool for liberation, introducing practices of *consciousness raising* and *feminist art*[11] practice to the field of technology. Claire Evans writes about the cyberfeminists:

> […] the question is not one of dominance and control or of submission and surrender to machines; instead it is one of exploring alliances, affinities and coevolutionary possibilities […] between women and technology (2014).

Artists were concerned with the agency of new technologies and their potential to raise the status of the gendered body, including Jackie Hatsfield, who asks "how is it possible to make visible what is unseen about the body beyond the surface of representation?"(1999, 61). She says "what I am interested in as an artists is to define the body as subject, not just a commodified unit, or a representation" (1999,63). The aim of the collective Technowhores was, according to its member Rosie Higgin, to use pleasure and humour as a strategy to fight a discourse that deems the technological as universally masculine, and as such, "[…] locates the technological beyond the realm

[11] *Feminist art practice* was, during the 60s, termed as an individual form of practice in which women artists rejected the patriarchal structures of the art world and its media, which were traditionally defined by and for male artists. Feminist art practitioners began to explore their bodies as canvases and made art works reflecting women's lives, coining the personal as political by including the domestic and woman making practices such as knitting, stitching and embroidery that had traditionally been defined as *craft* and not fine art.

of women"(1999, 94). Their works were often experimental and explored relations between the "real fleshy body and its simulation through technology (digital, video and film)" (1999, 113). Laura McGough writes,

> They reject the cyberpunk model that posits cyberspace as "bodiless exaltation," a place of the mind where the body is obsolete. Instead of leaving their bodies behind, these artists are dragging their bodies along with them into hyperspace, sometimes almost literally as in the case of Linda Dement who digitized her own flesh and various body parts of other women for her most recent CD-ROM, CyberFlesh GirlMonster (1998).

Cyberfeminists were generally concerned with what Katherine Hayles called putting "[…] back into the picture the flesh that continues to be erased in contemporary discussions about cybernetic subjects"(Hayles 1999, 5). Cyberfeminists' work is sometimes seen exhibited in the field of art and technology while artists drawing on formats of performance and intervention to critique the new forms of control introduced within the infrastructures of bureaucracy often remain unexhibited in this context.[12] With a strong focus on liberation in second wave feminism, some artists distanced themselves from technological development because of its close ties with military and imperial forms of power, yet they were still producing relevant work on the topic of technological measure.

For example, the more than the forty-year-long artwork *Mesu-RAGE* (ORLAN 1665) by ORLAN renders a radically different position on the culture of measure. The work consists of a new standardised measuring unit, namely, the artist's own body. With the body as measuring tool, she works her way through big cultural institutions by lying flat on her back, measuring them up literally "ORLAN-body"

[12] The cyberfeminist project can be seen as continued in many contemporary practices such as the Deep Lap project, Hito Steyerl's work and in the work of Zac Blas and Katherine Behar who carry on explorations of gender politics through the use of specific technologies interjected with strategies of the absurdity, humour and pleasure.

by “ORLAN-body.” The title invites us to rethink the relationship between measure and rage, and how this intersection can produce new forms of resistance within artistic practice itself. ORLAN describes her performances as processes of “measuring up the cultural institutions” as a model of accountability, representing a radically different approach to critically analysing the meaning of “quantified space” and its cultural depths. As such the method presented by ORLAN provides a critical lens that goes beyond using a technical instrument, while still questioning the very act of measuring itself. ORLAN’s work encourages us to ask deeper questions on the biases and premises that underlie physical acts of measure when she uses her body to “take up space'” in one historical museum after the other, reclaiming exactly the space that women have been denied throughout history. In this sense, she reverses the techniques of quantification in order to hold the institutions accountable, presenting the body *as counter*-object. Marta Rosler’s early performance-based video work *Vital Statistics of a Citizen, Simply Obtained* (Rosler 1977) shows a naked female member of the public being examined by a male doctor; if her body falls outside the measure of the norm, a loud buzzing *fail* sound goes off. The work does not evolve around what technology is used to capture her body, nor the information that is recorded, but instead, on the parameters of normalcy against which bodies (here female) are produced as *wrong.*

While often not included in the conceptions of art and technology, the questions of feminist practices in the 60s were invested in unpacking the relationship between bodies, datafication and quantification. Both ORLAN and Rosler unpack the question of embodiment in their practices exploring what a body might be in the context of computational culture through what actions it is made of and in relation to what machines and logic. These are very different starting points to the representative methodologies I discussed earlier in which the body is reproduced as a neutral and passive surface that can be used at the pleasure of the artist. Feminist approaches do not take for

granted what counts as a body but instead position the body as a site of agency and change by asking what can a body become through the acts of becoming a number, code or statistic?

Both performative work around cultures of measure and bureaucracy and more traditionally cyberfeminist practices provide perspectives that enforce one another in the examination of computational culture. Whereas ORLAN and Rosler's work look specifically at rendering the body as a site of lived experience of measuring culture, the cyberfeminist practices were focused on ways of appropriating the powers of new technologies for the benefit of women. The limitations of cyberfeminist projects might be seen in relation to the reproduction of the Internet user as a "woman user," as most cyberfeminist art was contextualised in the white and Western computational culture that also dominated the emerging field of art and technology. With the rise of home browsing in the 90s, the media habits of the Westerners became a common way to conceptualise the impact of new technologies in everyday life while, at the same time, the experiences of people who make, manufacture and maintain new technologies were left unaccounted for in this field, even though women were at the time concretely a part of maintaining and building computers. Looking to artists who have more directly addressed labour aesthetics in their practices, I will now explore how social and material concerns can be taken into the centre of artistic practice.

A Minimalist Problem: Labour Aesthetics

During the 60s when artists began to make art with computers in the Bell Telephone company, the contemporary art world also saw a rise in minimalist practices led by artists such as Richard Serra and Donald Judd who pioneered large-scale steel sculpturing practices. Helena Reckitt argues in her article "Forgotten Relations: Feminist Artists and Relational Aesthetics" that the minimalist agenda created a situation, where

> artists were 'lifting' industrial processes and forgetting about the whole culture that they come out of. So Serra was this steel worker without the work, without workers. And Judd was this carpenter without workers (2013, 134).

Is digital materiality taken for granted by artists in the same way that earlier minimalist practices appropriated steel and wood from their manufacturing context and therefore also erased the connection to the labouring bodies and their value? While I have identified the lack of artistic engagement with the material context of technologies used in media arts practices, Reckitt points to the fact that material contexts are connected to workers' bodies. Both Klingemann's artificially modelled body motif *The Butchers Son,* which he created using porn data, and AOS's performance *BodyQuake*, which uses epilepsy data, do so without connecting to the bodies from where this data originates. Looking to earlier feminist practices, models for taking labouring processes as a starting point for artistic examination, was explored in the work of American artist Mierle Laderman Ukeles, who coined the concept of *maintenance art* in the *Maintenance Art Manifesto* (1969). She includes a range of acts of manual labour such as washing, cleaning, dusting and other menial tasks in her performances, such as *Hartford Wash: Washing, Tracks, Maintenance — Outside and Inside* (1973) where she cleaned the museum as her performance, bringing the labour of maintenance worker into the centre of artistic practice. She positioned the work as a political statement against the invisibility of people who *care* for the population and as a response to the economic crisis in the 70s, where many public maintenance contracts were tendered out to private providers. Like other feminist practitioners, Ukeles's engagement with labour in her practice came from becoming a parent and having to take a job as a maintenance worker to provide for her child. Ukeles's work is connected to lines of practice that more specifically explore the aesthetics of labour and movement, including work on movement studies such as Etienne-Jules Marey's chrono photography from the 1830s (Marey and

Pritchard 1895). The new forms of work emerging in the digital industry require a thinking of the worker beyond traditions terms because, in many cases, the "work" in the big data industry is distributed both across individual users, online workers, influencers, digital maintenance workers and data entry workers. Artists have explored digital forms of work, such as the contemporary artist Kajsa Dahlberg who in the project *Reach Grasp Move Position Apply Force* (2015) examines the role of film in the development of Method Time Measurement (MTM) through an exploration of the implications of Amazon's tracking systems for its workers. The documentary *The Cleaners* by Hans Block and Moritz Riesewieck explores the precarious conditions that underpin digital cleaning work, such as commercial content moderation which is often outsourced to countries like the Philippines and India (Block and Riesewieck 2018). YoHa's work *Coal Fired Computers* (2010) explores the body of the miner and its relation to the global movement of coal as the English industry was destroyed by the Thatcher government in the 80s, and after which the UK began importing coal from deregulated mining sites across the world. Within these practices, the concerns of workers are raised in different ways by focusing on the worker, the moving body, the financial system or the technical system itself. In my own practice, I draw on how these existing artistic practices that have addressed the concerns of workers in the making of their work or in the exhibition of it. The question of how audiences have been centred in different ways has also been a concern for more politically engaged practices, often referred to as *critical practices,* within the field of art and technology.

Critical Practices

Media arts practices have been defined as politically active (Tribe and Jana 2009) because of their connection to earlier cultural formats such as Dada, punk culture, conceptual art, Situationism, anarchism and Free/Libre and Open Source Software (FLOSS) that often inform projects that seek to questions the formation of corporate and governmental power. Equally, the use of opensource tools potentially democratises the access to technical artmaking tools as well as access to knowledge and information systems.[13] However, there is a current interest in formulating these politically engaged practices as *critical practice,* integrating technical making with socially engaged forms of practice, workshops and activism. Following Phill Agre's concepts of *critical-technical practice*, Graham Harwood and Matthew Fuller explore practical and collective methods of *unpicking* underlying socio-technical biases of computational systems, which also informs the work of Natalie Jeremijenko, and Phoebe Sengers (Boehner, David, and Sengers 2005). The group *Forensic Architecture* led by Eyal Weizman explores using architectural rendering software to investigate potential war crimes, directly applying technical methodologies in the favour of human rights work and activism. The *Critical Making* project in the Netherlands explores how artistic practice can contribute to the field of technical making practices, which have otherwise been dominated by the industrial paradigm (Cramer et al. 2017). The *Critical Makers Reader* by Loes Bogers and Letizia Chiappini (2019) challenges the idea of making as an isolated activity in the maker lab. They ask artists, makers and activists to give an account of their conceptual, practical and technical approaches that include feminist hacking projects, recycling and repair, DIY electronics, online sex work organisation and housing activist projects, and as such, they point to the social and political contexts that makers are

[13] New media art practices have experimented widely with the making of alternative circuits of cultural production that go beyond the commercial market, as seen with the net art of the 90s, browser art, screen saver art, barcode art, phone art and open source publication experiments.

developing their practices in. Big data has been at the centre of a recent number of feminist-informed critical projects, such as *Feminist Search Tool* by Hackers & Designers in collaboration with Read-in (Read-In Hacker & Designers Collective 2016) and Caroline Sinder's *Feminist Dataset* (Sinders 2017) where the designer explores the gender-bias in the data industry by asking workshop participants what feminist data might look like. Intersectional questions are equally emerging with Steyerl's work on housing and poverty data in *Actual Reality*, Nelles and Al-Badri's engagement with anti-colonial artistic practices in their project *Queen Nefertiti Hack* (2018) and Mimi Onuoha's work on *Missing Datasets* (Onuoha 2015), which explores racial bias in how data is put to use in society, prioritising some bodies over others.

The definitions of criticality in some of these projects come across as a useful way to explore the potential for understanding the relationship between class, gender, race and technology and the potential for the development of counter technologies and new forms of resistance. There is a clear sense of a social concern being prioritised in how these projects are conceptualised and produced, allowing for the relationship between artist and audience to be rethought as a question of collaboration rather than as viewer or buyer. These practices have created an important space where it is not only a matter of artistic practices working social concerns, but that also take on intersectional feminist methodologies in the development, production and showcase of the work.

The collection of practices from across seemingly disparate fields of cyberfeminism, performance art and critical practices share a collective mode of investigating its environments rather than focussing on the production of objects or images. Equally, these practices share an interest in creating artistic processes that can accommodate and examine social concerns related to new technologies as well as how they might be reproducing structures of power. It is from this notion of practice that I depart

in my own research, where I explore what a concept of data allows for going beyond thinking data as a product or economic resource and for expanding the framework and material context for thinking the relation between data and bodies. In the individual research projects, I respond to the gaps identified in the field of art and technology practice by reflecting on how my practice bridges such gaps by moving the focus from making art through novel technological experimentation to producing a set of conceptual frames that allow for artistic practice to conceptualise the lived experiences of data and the social and material costs of its production. In the next chapter I will introduce how positioning data as ecology helps frame the relevant sites of the research administratively, politically and materially.

CHAPTER 3

CONCEPTUAL FRAMEWORK

The conceptual framework of the research creates a foundation for thinking data beyond being financial resources and products. As argued by Nathan Moore, the digital economy should be defined as dependent upon *ecology* (Moore 2013, 60), which through my research I contextualise as both the material, administrative and bodily sites that underly the digital economy: the bodies that produce it, the databases and technical system its stored in, the hardware and devices that enables it to exist and the social and administrative routines for which data is used. Opening up to thinking data across a number of geopolitical sites equally enables me to address, through the practice, how the digital accumulates across bodies. What counts as a body in the context of data ecology is more specifically addressed by drawing on Object Oriented Feminist practitioners, feminist visual cultures and affect theory to create a frame to define how the term body is used and developed within the research.

Data as Ecology

Thinking about the *administrative ecology of data* was necessary for working on the artistic projects in the context of maternity healthcare data in the UK. Here, data is not thought of as a product but instead it functions as administrative process to represent a body in data so it can be processed within the administrative system. Data within healthcare is generally produced by or from bodies (through questionnaires, tests, etc.), processed by midwives, handled by administrative staff, stored in central databases, circulated across public and commercial offices, and worked on by private tech companies who supply the NHS with digital services as well as used by governments, researchers, media and private companies. Practically speaking, all of these sites and processes are inclusive to the reality and value of data from the perspective of healthcare. This however cannot be grasped with a framework that focusses on data itself nor the analysis of it, but instead through a focus on the idea of ecology, allowing for these processes and contexts to become a part of the understanding of data as a materially and socially active matter. While the administrative ecology of data allows for a body

to become digitalised and thus representable in the healthcare system, this process is not without agency because the data capture also becomes a regulating force for that body. The way that the quantification of health becomes a form of governance in itself is addressed by Michelle Murphy in her work on the *economisation of life,* where she explores the financial engineering of reproductive care (Murphy 2013).

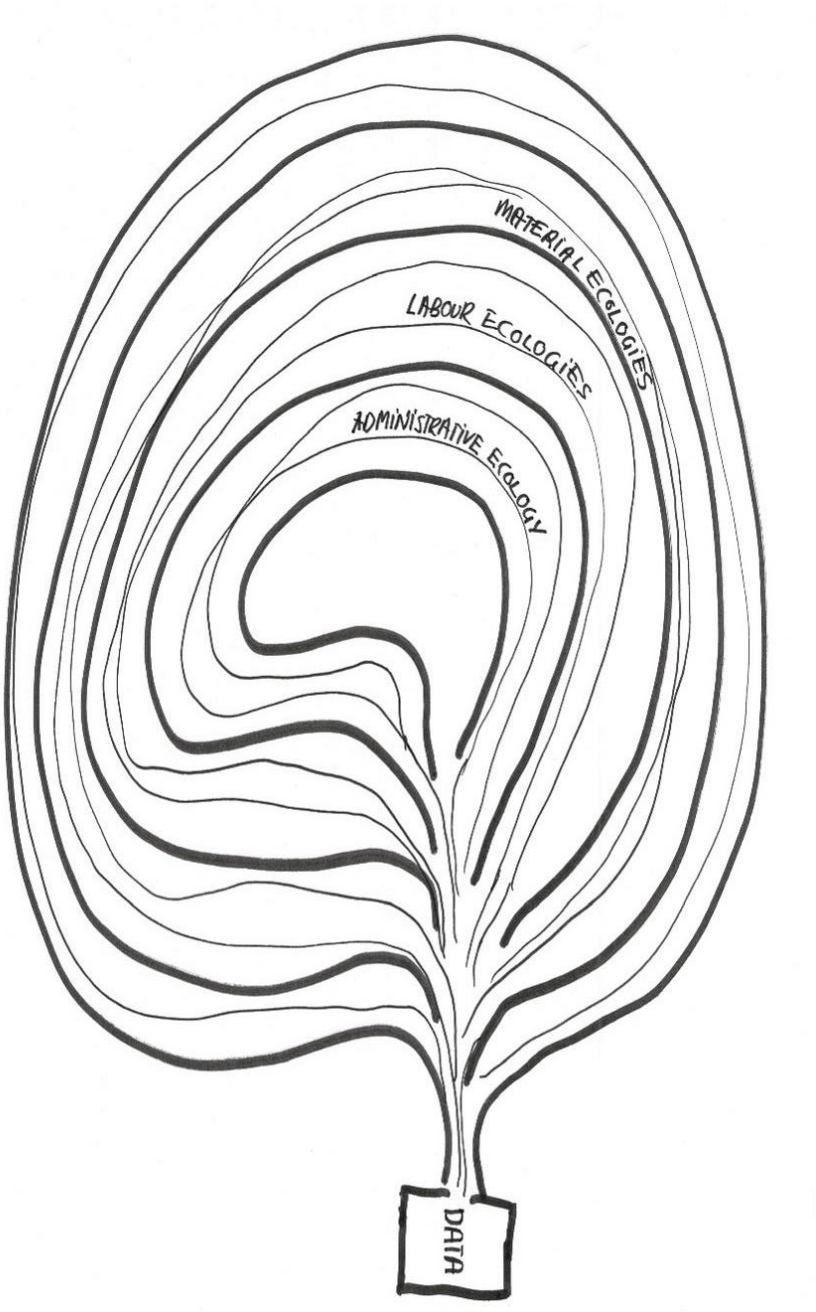


Figure 4. Alexandra Jönsson, *Conceptual Framework Map*, ink on paper, 2017.

As commercial structures increasingly define how data technologies develop and how they are used, it is necessary to look at the economic systems that frame this development. New forms of capitalism defined as *platform capitalism* (Srnicek, 2017) or *surveillance capitalism* (Zuboff 2019) are driving forces behind the increasing demand for data and the development of new technologies, but instead of contextualising this economic system through its production, I will explore its *ecologies of labour.* In Zuboff's account of surveillance capitalism, the user (data producer) is framed as a free source of labour in the expanding market of predictive products but, importantly, the digital includes various sites of production and manufacturing across the global market, as noted by Christian Fuchs in his work on the *political economy of social media* (Fuchs 2014). The labour ecology allows us to think *workers' bodies* beyond what qualifies as a digital work in the West and to take into account how centring the concern of workers' bodies always includes the risk of omitting others. Workers, as argued by Marie Hicks, have always suffered an ongoing erasure in the history of computing. It is a story that has been told of great men and their inventions, and these stories would "gesture towards corporations' grand global strategies, and the marketing that those companies pushed to try to define *what computers were* for an entire generation of workers" however she adds that they "would not focus on the workers themselves"(Hicks 2019).

From the 1940s onwards, women were not only workers in the field of computation, they literally were the computer. Being a computer was a profession mainly filled by women who carried out the tasks of "direct programming," which included wiring and setting values for general purpose computers. Both white women and women of colour were a central part of the development of computing during the Second World War, working at the secret research facility Bletchley Park in the UK and the Electronic Numerical Integrator and Computer (ENIAC) in the US (Chun 2013; Willliams 2015). The human computer had to follow fixed instructions without deviation (Willliams 2015), and

while the women were trained in mathematics, garnered intimate knowledge of the machines and became highly skilled operating them, they rarely rose to the ranks of their male superiors (C. D'Ignazio and Klein 2020). Being a part of the machine, rather than a user of the machine, was, however, never profitable for the individual.

> In fact, IBM UK measured the manufacturing of computers in "girl hours" (which were less expensive than "man hours") because the people who built the machines were nearly all women. Meanwhile, the British government, the largest computer user in the nation, called their computer workers the "machine grades" and later, the "excluded grades"—excluded from equal pay measures brought into the Civil Service in the 1950s. Because their work was so feminised, the government declined to give them equal pay and raise their pay to the men's rate on the basis that the men's wage was almost never used. Therefore, the lower, women's wage became the default market rate for the work. So concentrated in machine work were women that the *majority* of women working in government did not gain equal pay (Hicks 2019).

In the same way that women were actively written out of the history of computing, even though the structures by which they were devalued have been sustained, the workers' bodies and experiences are often omitted. D'Ignazio and Klein raise the question of invisible labour in the context of data science:

> When was the last time you saw an analysis of census data list the names of any Federal Census Workers, those people outfitted in orange safety vests who knock on your door to remind you to fill out your census form? Or what about the pool of typists who hand-keyed the text of the historical newspapers that you used to train your neural network? (Ignazio and Klein 2019)

Sarah Roberts argues that it is not in big tech's interest to acknowledge the "hands-on" labour that goes into keeping big data factories such as social media running, but for the general public "it goes to our misunderstandings about the Internet and our view of technology as being somehow magically

not human”(Chen 2014). The visibility of the worker is structured by both class and gender, making bodies within big data and AI, like in content moderation, data entry work (Amazon's mechanical Turk, captioners, click workers, transcriptionists), online raters and the outsourcing of customer compliances departments (call centre workers, customer support and cold callers), practically invisible. New labour management models by Amazon implement metrics to control and enhance the efficiency of workers, and data-driven performance management software, timed content moderation work and data entry work are on the rise.[14] Drawing on the history of women and technology in particular, I will continue to explore a perspective in which body and machine are inseparable by action.

Becoming Image, Becoming Data

The idea that technical objects, such as phones, computers and databases, are somehow contained by their materiality and distinct from the bodies that make and use them is also what allows for the broad acceptance of artistic practices that position information as disembodied: a technical product that can be used, designed and appropriated without further consideration of the material and bodily sites it has been created from. If we think of the relation between bodies and technologies as a process or practice, rather than object or subject, we are pointed to an understanding of how data technologies might be embodied. This position implicates a collapse of the subject and object which has been described across feminist media theories, such as Laura Mulvey's work "Visual and Other Pleasures" (Macmillan, 1989), which explores how film has historically constructed a space of male pleasure. In visual culture, Rebecca Coleman explores the coproducing relationship between bodies

[14] These examples are all characterised by forms of precarity, isolation, lack of rights and low pay. Other jobs in the digital economy are equally on the rise, such as programmers, business analysts, hardware and data maintenance, however, these jobs are often better protected by workers’ rights and higher salaries.

and images. She argues via Mary Ann Doane (1992) that for the masculine subject there is a gap between what he looks at and what he knows, but for the feminine subject this distance or gap is negated: "[…] for the female spectator there is a certain over-presence of the image—she is the image"(Doane in Coleman 2008, 10). Who looks and the objects looked at "[…] collapses from the positions of women, because women themselves are constituted as objects […]" and the "[…] spatial and temporal gap between subject/body and object/image does not exist […]"(Coleman 2008, 9–10). This understanding of mediation looks at to how photographic or film practices themselves are co-creators of the bodies they represent. Coleman draws on affect theory to emphasise how the relationship between bodies and images are always in the making and changing, and importantly, that the production of meaning is not predefined by "good" or "bad" media content but depends on the cultural context and individual and collective image practices; the production of images can be limiting or enabling but never predetermined. I argue that this approach makes for a useful starting point to understand how the data can be seen as co-constructing of the bodies it records, and the meanings of data practices can be addressed as either enabling or limiting in terms of people's lives.

In the context of digital technologies, we can talk of how *the user,* instead of *the viewer,* has been conceptualised as the consumer of digital technologies. This position has implied that the relationship between body and technology has been conceptualised with the human body *in charge.* This model of thinking digital embodiment also comes from the commercially oriented fields of Human Computer Interaction (HCI and product and User Interface design (UIX)), where a standardised and often abstract concept of a body is used as the template for thinking digital interaction. However, in the context of surveillance capitalism, I argue that the body is more rightfully thought of as a worker. Tiziana Terranova notes that digital exploitation is closely linked with the shift from users being customers on online platforms to being unsalaried workers around the clock in digital sweatshops,

creating, editing, categorising and distributing online content (Terranova 2000). This shift has been understood through concepts of *playbour* (Fuchs 2014; Andrejevic 2009) in which playing, for example, socialising with friends and family online, playing videogames, looking at images, watching videos and reading the newspaper, shows how everyday life is increasingly targeted by gamified forms of work. Equally, self-tracking health and fitness applications have been described platforms where "funny and pleasurable Taylorism of everyday life" can be implemented (Maturo and Moretti 2018). While these notions are important to understand how leisure time is now *also* profitable, Zuboff argues that as more and more of our lives will become measurable "every society, every social relation and key societal processes are now a fresh terrain for rendition, calculation, modification and prediction" (Zuboff 2019, 4). Concretely, data is captured from keystrokes, likes, emails, browsing, entering an electronic gate and using credit cards that will go into some kind of database, and this makes up the foundation of what Zuboff calls *surveillance capitalism*: a twenty-first-century means of behavioural modification in which bodies become a site of capital interest and, in turn, the behaviours, habits and situations become sites of nudging, optimising and finetuning the stream of data. She suggests that ubiquitous computing is the foundation for a new kind of capitalism based on behavioural surplus; that is, the use of human behaviour as raw material for training machine intelligences and the production of *predictive products*. She notes that the focus on the digital user being framed as products (prosumers) by social media platforms, misses the fact that users are no longer seen as "the customers," instead, they are being framed as the very raw resource of big data. She adds that these "raw material supplies must be produced at an ever-expanding scale "(2019, 87). While Zuboff focusses on the erosion of a right to privacy and the irreversibility of implementing data technologies for surveillance, her foundation for thinking bodies as private to begin with is problematic. While privacy is an important cause, the right to a private,

boundaried and non-public body, is a reality that has only been lived by the few. This evidences the need for expanding the framing of social consequence of surveillance technologies beyond the user and for contextualising them in specific lived realities of both individual workers and wider communities. The risk of Zuboff's focus on the individual user against the dominating capitalist structure is that we lose sight of how the digital can be located, addressed and resisted through everyday life.

Thinking with the material formats of data might offer an opportunity to resist the omnipotent narratives of the digital. In the project *Wastelands* Nana Thylstrup and Ulrik Ekman ask what stories abandoned websites and databases, data rot and social media grave yards tell (2019). The investment in discourses that present data as *effective* and *useful* is often so intense that the practical and material reality of data itself is overseen, even though, as suggested by Thylstrup and Ekman, data actually creates a new kind of waste problem. The reality of data, argues the artist Katherine Behar, is that it is always "[…] on the verge of becoming just junk, neither useful nor exchangeable, like plastic, a hoarder's embarrassment" (Behar 2016, 10). Data is intrinsically reliant on plastics and metals that are used in the manufacturing of chips, boards, plastic, metals and wires, and, these resources are not considered in artistic practices that focus on *representing* data or using data to train new algorithms. However, there is a growing number of feminist artists that take as a starting point the life of objects to develop methods to reference the material ecology of data. These practices have been defined by Behar as Object Oriented Feminisms (OOF): "[…] a feminist intervention into recent philosophical discourses—like speculative realism, object-oriented ontology and new materialism—that take objects, things, stuff and matter as primary"(Behar 2016, 3), and this, she argues, allows us to engage with the histories in which certain people (women, People of Color (POC), queers) are treated as objects. OOF is a movement of practice-involved theory, rendering visible how

experimentation with new technologies and objects can produce their own stories and perspectives. The focus of OOF brings two important things to the debate on feminist materialities. First, looking at the world from the perspective of objects, it allows us to see that the individual whose life is captured in data will be outlived by every single component of that data technology (the information itself, chips, boards and plastic boxes) by hundreds of years. Secondly, in line with much of the new materialist agendas, the dominance of the anthropomorphic is displaced through a renewed focus on non-human life.

The focus on data as ecology enables me to position my practice as an ongoing examination of how bodies might appear as objects in the ecology of data, sometimes framed as the product and other times framed as the very raw matter of platform capitalism. In combination with the experience of workers in the digital ecology, from miners and workers who process, produce, and recycle the hardware to data entry workers, online influencers, child gamers and prosumers, data becomes revealed as something laboured and bodily. This context is what I draw on in my examination of the body politics of data to bring the material context of data and its bodily reality into the centre of artistic research. Following from the discussion of the administrative, labour and material ecologies of data production, I would like to specify how the practice-based research uses an *affective framing* of what counts as a body.

The Affective Body

Affect theory more generally has been used across digital media and cultural studies to understand mediation and interaction as an embodied process. The focus on the body as a process and always "in the making" in relation to its cultural, social and material contexts allows for a more generative understanding of what might count as a body. The body within the register of affect is understood as open and moving habitually as well moved by the capacity to be affected. Affect has broadly been

defined by two theoretical strands: one in which affect is defined as separate to emotion, and the other, in which emotion and affect are seen as extensions of one another.[15] In the latter, affect remains entangled with terms such as feeling and emotions, as seen in the work of Sarah Ahmed, Coleman and Blackman, whereas other approaches by Brian Massumi and Patricia Clough focus more closely on defining affect as a universal, un-mediated force, set in the non-linguistic, non-cognitive, non-personal fields that register within the physiological body (Schaefer 2019, 2). The definition between these two perspectives, according to Ann Cvetkovich, comes down to distinguishing *affect* as "precognitive sensory experience and relations to surroundings" and emotion as "cultural constructs and conscious processes that emerge from them, such as anger, fear or joy"(Schaefer 2019, 2). Ahmed's work focusses on developing the existing theories of emotion in such a way that they include the processes described as affect (Ahmed 2014, 207–8), instead of erasing the connection to the large body of work on emotion produced by intersectional feminist theorists and practitioners throughout the last century, she goes on to argue that the very idea of differentiating between emotion and affect, in which the latter is unmediated and therefore escapes signification and the former is mediated and contained by signification, can be seen as a gender distinction.

Looking to the scholarship on digital embodiment, a number of theorists, such as a Mark Hansen and Mike Featherstone, draw on Massumi's work on affect with the aim to move beyond ocularcentric understandings of a disembodied informational body. They use affect theory to situate *vision* as an embodied act which is multi-sensory and relational (Stern 2013, 26). Hansen's concept of the body as *enhanced* in the context of online visual cultures, is based on the expanding on the act of *seeing*

[15] The circumstance surrounding the making of *the affective turn* has been questioned by feminist theorists such as Sarah Ahmed and Ann Chetkovich who argue that the concept implies that it is a *new* field of study, while the relationship between women, bodies and emotion has been the subject of study for decades by feminist and queer studies. This becomes more problematic because affect theory has been defined separately to feminist theories of emotion and, by some, even positioned against theories of emotion.

itself as *haptic* because the whole body is engaged in the process of mediation through making, sharing, distributing and organising media on social media platforms (Hansen 2001). Featherstone develops the concept *the body without image* from Massumi's idea of *movement vision* to shift the tools in his analysis of contemporary body transformation cultures from a static body image to a body in process (Featherstone 2006; 2010). Both of these concepts are useful in understanding how users' bodies are actively engaged in the production of digital data while using smartphone applications, tablets or computers, as opposed to merely being a passive source of information as suggested by Zuboff. However, Paglen argues that we miss out on crucial aspects of how surveillance industries are designed if we continue to think that the user is at the centre of big data infrastructures (Paglen 2016). For instance, by design, the Internet is created for machine to machine interactions with as much as fifty percent of its content never seen by the human eye, while data, images included, are produced and calculated by machines and ranked and rated according to their patterns of circulation.

> Visual culture has changed form. It has become detached from human eyes and has largely become invisible. Human visual culture has become a special case of vision, an exception to the rule. The overwhelming majority of images are now made by machines for other machines, with humans rarely in the loop. The advent of machine-to-machine seeing has been barely noticed at large, and poorly understood by those of us who've begun to notice the tectonic shift invisibly taking place before our very eyes (2016).

While Paglen argues that in the context of surveillance capitalism, the central focus of online visual cultures has to evolve around *how machines see us*, Hansen and Featherstone call for the body to be recontextualised with a shift from theories of *seeing* towards theories of *doing*. Both sets of concerns in terms of thinking embodiment are valid but they both seem to centralise the "body" as being the human user, either as a body experiencing enhancement as argued by Hansen or becoming obsolete as argued by Paglen.

These ways of using affect to understand mediation, however, lack a situated analysis of how bodies are concretely living in social and material context; and as noted by Cvetkovich, affect itself as a concept is historically constructed in a range of ways (Schaefer 2019, 2). Ahmed takes a starting point in the lived realities of how information and emotion circulate between bodies through affective economies, which are often fuelled by racist and misogynist ideologies (Ahmed 2004b). Rai's work on the culturally specific practice of *jugaad*[16] as a form of resistance within contemporary Indian media ecologies also takes as a starting point lived socio-technical realities. He takes into account how the production of media content materialises through culturally specific ways of using and sharing media technologies and, importantly, points to how social and bodily risks are produced affectively and socially, not just between objects and individual bodies (Rai 2019, 3). Ahmed equally argues that social media is becoming a hot bed for racist and misogynist feelings, showing that rather than being located *in* bodies, emotion moves between bodies (Ahmed 2014, 117). Such economies of fear travel between bodies and signs and stick to the surfaces of things and people, suggesting "[…] that emotions are not simply "within" or "without" but that they create the very effect of the surfaces or boundaries of bodies and worlds" (Ahmed 2004, 117). By only focussing on the physical body, social practice and connection between bodies are lost, reducing

> […] memory to a bodily form of habit which relies on a singular body and fails to consider how a non-conscious or unconscious can be shared, is plural and can exist and circulate between subjects, as we have seen with telepathic modes of affective transfer (Blackman 2010, 177).

[16] Jugaad is a colloquial Hindi, Bengali, Marathi जुगाड, Punjabi, Sindhi and Urdu word, which refers to a non-conventional, frugal innovation, often termed a "hack". It could also refer to an innovative fix or a simple work-around, a solution that bends the rules, or a resource that can be used in such a way. Wikipedia

This Blackman calls the *immateriality* of affect, which is erased in models that take the physiological body as a site for understanding affect and, in turn, negates the very roots of *affect* theory itself, pointing to the fields of experimental psychic research from the twentieth century that explores transhuman practices such as telepathy and suggestion within science.[17]

The theories that situate the theoretical framework within the lived realities of the social world have a certain openness to learn from its research environment rather than wanting to define it. I have been thinking *with* this openness in my practice and have identified the potential for these theories to also give language to the lived experience of data work. In the practice-based research, I explore how artistic experimentation can widen the way we can think digital embodiment across the geopolitical context of the data ecology as well as develop a visual format that enables us to identify when the body is being summoned by forms of capitalist work.

[17] The experimental traditions of psychic research were themselves part of scientific practice, however, today they are seen as outside of mainstream scientific practice that continues to operate with the physiological body as confined by the boundaries of the skin.

CHAPTER 4

METHODOLOGY

In this chapter I will introduce the notions of practice that I rely on in the research as well as the methods that I have developed to address the research questions. I take an experimental approach to "grow" a context-specific methodology through which data can be examined as socially and materially experienced. To do this, I rely on feminist approaches that include lived experience as active agents of knowledge, allowing for the identification of a daily experience of data and for the potential risks for individuals and groups to be defined as a social concern.

The idea of artistic practice as examining of individual and collective concerns was introduced into the artworld through the concepts of public art and socially engaged artistic practice in the 70s. *Public ways of knowing* was defined through artistic projects that were socially concerned with the rights of women, LGBTQ and black communities both in the US and UK, where the legal, spiritual, social and medical status of bodies were more directly examined. Projects such as Woman's Building, the Feminist Art Programme at California Institute of Art founded by Judy Chicago and Miriam Schapiro in the 70s, the work of Martha Rosler and Mierle Laderman Ukeles and, in the UK, the work of Joe Spence and Rosie Martin all had a collaborative context for explore feminist politics of the body. Racial bias within white feminist groups, however, meant that the concerns of women of colour were often marginalised, and this affected whose *social concerns* were expressed and defined within these movements. Therefore, we often see separate trajectories for the Black and queer feminist approaches that claim artistic practice as a site of resistance, with collectives such as the Combahee River Collective, a black lesbian organisation in Boston, and New York City based groups Weusi Artist Collective and the Where We At collective, addressing struggles experienced by African American communities.

In terms of defining data as a feminist concern, it is necessary to contextualise how gendered experiences are not purely human but exist in relation to the technologies that define what comes to count as a body in a contemporary society. I therefore draw on existing artistic practices that framed the non-human agency of government bureaucracy, grey media (Fuller and Goffey 2012) and databases, as co-constructing of social experience. The Artist Placement Agency (APG), and earlier groups such as Art and Language, specifically focus on working inside institutions to appropriate bureaucratic forms of value. They present an early model for examining bureaucratic forms of power. The collective YoHa also frames its work as a *public enquiry* through which it examines technical infrastructures and databases as sites of social concern by taking the context of data management in government offices and healthcare clinics as sites of artistic practice. These forms of social practices not only frame social concerns as "human," but exemplify how systems such as bureaucracy and databases have their own agency in the way that they amplify the systems that they are set up to serve. Today, however, these roots of socially engaged practice are often replaced by more neutral conceptions of the social, such as relational aesthetics or participatory art, erasing the labour of feminist, anti-racist and materialist artists who frame social concerns within artistic practice.[18] In redrawing the connections to these roots of socially engaged artistic practice in the research, I attentively pursue how white feminist language and practices have been exclusionary by taking into account how the relations between gender, race, class and sexuality intersect.

[18] Helena Reckitt crafts a concise critique of Nicholas Bourriaud's concept of *relational aesthetics* in her article "Forgotten Relations: Feminist Artists and Relational Aesthetics" arguing that while authors dismisses anti-racist, environmentalist and feminist practices as the most "die-hard forms of conservatism" (138), the kind of art he promotes through his concept directly emulates these practices established by the very social relations and situations as forms of artistic practice. However, as he denies the connection, their histories, he positions himself as the novel creator of these formats, however, now appearing as hollow forms for a disembodied and affectless social realm that reproduces the exhibition space as a neoliberal, risk-free site of public participation.

Artistic Research

The role of the artistic practice within the research can considered within the performative research described by Barbara Bolt;

> This new paradigm of research could be deemed the "performative paradigm," a mode of research characterised by a productive performativity where art is both productive in its own right as well as being data that could be analysed using qualitative and aesthetic modes. (2016)

The ways in which the artistic experiments interject new perspectives into the processes of *knowing* in terms of materials, scale, temporality, and action, mean that the research methodology is neither qualitative nor quantitative, but performative. The research objectives can therefore be framed in terms of 'new ways of finding out' rather than 'what is to be known' to (Bolt 2016), as the practice becomes co-constructing of both the conceptual tools as well as the production of artistic projects in the research. Importantly, developing new forms of *knowing* does not follow a straight path from design to finished project, as new directions, questions, and possibilities emerge in the process of experimentation.[19]

The idea of an experiment can be contextualised within Isabelle Stengers' concept of *ecologies of practices*, a critical framework to consider power dynamics within and between different disciplinary practices.[20] I use the idea of an experiment to position my practice based research as an exploratory process where I create concepts, processes and interventions that examine the idea of data as

[19] Each project consists of a research phase (gathering materials, sourcing out a site of intervention, a dataset to work with, researching context), experiment(s) (exploring a number of ways to use artistic methods to intervene into material) and the making of a participatory form which would often be a social/conceptual structure for people to engage with such as an installation, intervention, workshop or performance).

[20] I use the term *experiment* to describe the processes by which the work is created and *project* to describe the work where experiments have led to a fully formed public project.

embodied and lived. Stengers' concept provides a framework to consider my own practice in relation to the existing artistic work in the field of art and technology, which largely draws on representative methodologies framing data as product or technical process. Stengers writes:

> The problem for each practice is how to foster its own force, make present what causes practitioners to think and feel and act. But it is a problem which may also produce an experimental togetherness among practices, a dynamic of pragmatic learning of what works and how. This is the kind of active, fostering "milieu" that practices need in order to be able to answer challenges and experiment changes, that is, to unfold their own force. This is a social technology any diplomatic practice demands and depends upon (2005, 195).

Steven Shaviro argues that Stengers' approach allows us to look at "[…] how truths are *produced* through various processes and practices. This does not mean that truth is merely a subjective, human enterprise, either: the practices and processes that produce truths are not just human ones" (Shaviro 2005). As such the agency of the technologies themselves and their material context can equally be active in the way that knowledge is constructed and expressed. This has encouraged me to think about the limitations and agency of the different methods employed in my experiments and to address how they make me "think and feel and act" because of the specific ways they allow me to interact with the research subject and materials. The processes of *handling* the different data ecologies in the research depends on the tools employed and the processes they generate. For instance, in the project *Data Collage* developed in collaboration with Bogers, we examined a large archive of images from Twitter shared around pregnancy, and we applied a number of different tools to work through the images, many of which were pornographic. When using the image analysis software ImageSorter, the content of the images themselves were not visible because the software organises the images on the screen in patterns according to colour, occurrence, size, etc. On the contrary, when using a pair of scissors to cut each individual image into pieces physically

processing the content with my hands, I directly experienced the content of each image. The different strategies to engage with the visual content collected from Twitter produced very different conceptual frames to think through the data. Looking at the visualisation pattern on my computer screen after letting the ImageSorter software process and analyse the image archive, I made no emotional connection to the images. When cutting the images by hand, my body resisted this experience and generated feelings of exhaustion, confusion and frustration. The specificities of the processes harbour different directions, they call upon different emotions and practical problems that need working through.

Stengers created the concept *ecology of practices* as a tool for thinking through physicist practices, which she argues that they "feel weak and protect themselves with the weapons of power, equating their practice with claims of rational universality"(2005, 196). She talks about the *tool,* instead of the *instrument* as what guides the practitioner, and she explains;

> Doing what I did, my own practice was that of a philosopher, a daughter to philosophy, thinking with the tools of this tradition, which excluded magic from the beginning and which, rather unwittingly, gave its weapons to physicists and to so many others presenting themselves in the name of universality (2005, 196).

Stengers raises questions on the forms of dominance that practices carry with them and how each practitioner must consider the implications for contextualising their practice with certain tools and their histories. The practice of data visualisation, for instance, can be seen to perpetuate ideas of specialised and objective scientific knowledge (D'Ignazio 2015), a practice that has historically fostered a mode of visuality that erases everything outside of quantification by claiming what is inside of the data is real. The process of visualising the Twitter images with the ImageSorter software created a distance to the material that resulted in the lived reality of the images to fade into the

background. Only by actively engaging with the images by looking at one sex worker pictured in the images after the other, the bodily labour of the online porn ecology began to transpire. This does not mean, however, that data visualisation as a method cannot be employed within artistic practice, but that Stengers' reflections allow us to understand the context around why the appropriation of tools must be done critically. This gives a frame to reflect on the dominating ways artists have explored data, e.g., through visualisation and design methodologies, that often come to feature a technical definition of data as *the* only definition. Instead of dismissing technical artistic practices, the concept enables the limitations of such methodologies to be addressed, like when the use of scientific tools reproduces the same problems and hierarchical relations between artist and material or artistic practice and audience as corporate scientific practices.

The practice-based research both occupies this experimental process and a critical consideration of how to respond to the existing artistic body of work within the field of art and technology. I will now introduce the collaborative context for the research and point to how this context was crucial for situating processes of experimentation, work production and critical reflection as a social activity.

Collaborative Artistic Practice

The research is created from both individual and collaborative projects that make the foundation for the movement between experimentation and critical reflection within the research. The initial phases of the research, the collaborative projects with Hammett and members of Autonomous Tech Fetish (ATF),[21] and the later experiments, under the collective identity The Body Recover Unit (BRU) with Bogers,[22] were catalysts in developing a platform for the practice based research.[23] The collaborations with ATF and Hammett focussed on developing collective and public formats for examining data in the context of everyday life and on building a language around data from everyday experience and practical experimentation. The projects with Bogers more specifically examined the potential for artistic practice to respond to live contexts of data. We developed a series of projects around maternity data in the UK, specifically the project *National Catalogue of Savings Opportunities* (NCOSO hereafter, 2017) and the workshop model *Data Collage* that departed from our common interest in developing feminist methodologies for examining public data ecologies and identifying how they were used to govern reproductive bodies.[24]

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[21] Autonomous Tech Fetish (ATF) is an open space for gathering, sharing and making. ATF ran a monthly Make & Do club (2013-2016) on topics such as encryption, biometrics and health policy focused on making, embodied learning and open discussion. I worked with Cliff to develop a series of workshops for the common house (2014-2016) that integrated our interest in making-pedagogies. The collaboration took place through workshop design, regular working days, facilitating workshops and later through the production of the exhibition project *Data Buffet* (2016) commissioned by the Museum for Contemporary Commodities.

[22] Loes Bogers is a researcher, educator and practitioner working on the intersections of art, design and technological practice as a part of the Visual Methodologies Collective at the Amsterdam University of Applied Sciences (NL). She runs the semester course *Minor Makers Lab: Making as Research.*

[23] The Body Recovery Unit (BRU) is an art-based feminist research group established in 2017 with the aim to explore ways to scavenge for body parts in digital waste materials, public records and databases to investigate their financial, social and political worth. The group was started by Loes Bogers and Alexandra Jönsson to form a collective platform for examining how the digital is *lived* and to develop projects with communities and individuals who are adversely affected by processes of digitalisation.

[24] The work took place during a residency at the Makers Lab in Amsterdam (01.02.2017-30.09.2018) and through the commission *Data Therapy* by Art Centre Nabi exhibited at the *Neotopia: data and humanity exhibition* (01.11.2017-03/01/2018). We had the support of the Digital Methods team to carry out scrapes, TCAT analysis and an introduction to Gephi visualisation software to work with the first capture of maternity Twitter data. Loes and I worked together one day a week remotely for the period of 2016-2017, with a number of micro-residencies in London and Amsterdam to produce work and give feedback on each other's experiments and then further develop the experiments together.

Figure 5. Jønsson, Alexandra, *Untitled* (server farm, Sweden), Body Recovery Unit logo, 2016.

The collaborations with artists Bogers, Hammett and ATF were both a practical and political strategy that allowed for the sharing of creative, conceptual and technical skills through the making of projects

using freely available artmaking tools such as FLOSS (Free Libra Open Source Software).[25] Described as Do It With Others (*DIWO*) by the media arts gallery Furtherfield (UK), the revamp of the Do It Yourself (DIY) concept that influenced many artistic practices from punk, situationism and the later net art practices of the 90s, refocuses artistic practice around its collective potential and process.

> The process is as important as the outcome, forming relationally aware peer enactments. It is a living art, exploiting contemporary forms of digital and physical networks as a mode of open praxis, as in the Greek word for doing, and as in, doing it with others (Garrett and Catlow 2007).

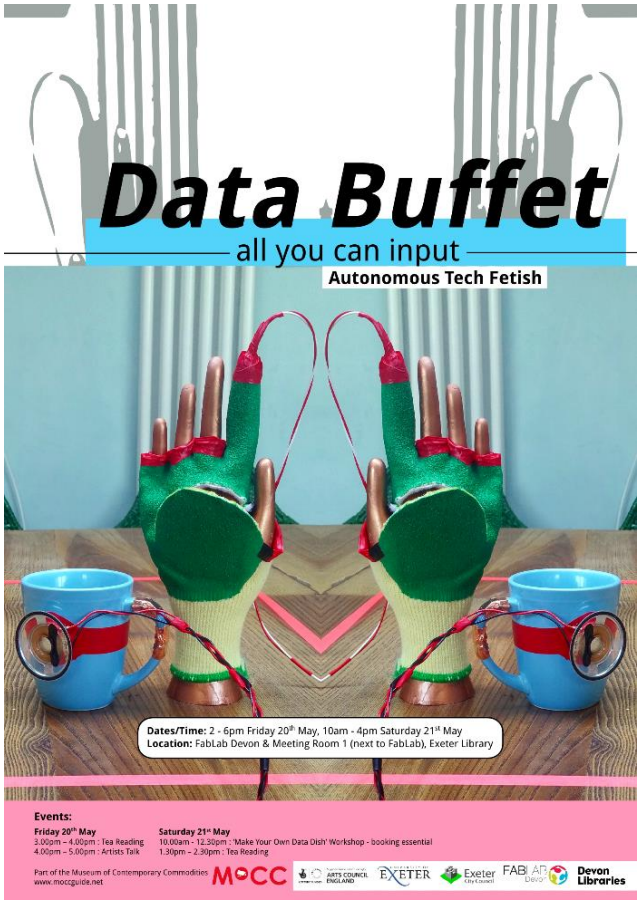
The focus on collaboration as a cultural necessity is a response to a climate of "mass privatisation, deregulation and marketisation and the breaking down of educational funding world wide—which "[..] imprisons everyone's creativity in the prism of brutal economic 'necessity'" (Garrett and Catlow 2007). DIWO, in many ways, can be seen as a counter movement against the pressure for artists to be individually competitive and economically self-sufficient brands when infrastructure, spaces and public funding for artmaking is eroding. Practically, the idea of making together is a living format that can sustain artistic production, but collaborative work is also contextually dependent on the processes of sharing of skills, situations, income, emotions, time and the needs of the collaborating partners as well as forms of invisible labour that might underlie collaborations.[26]

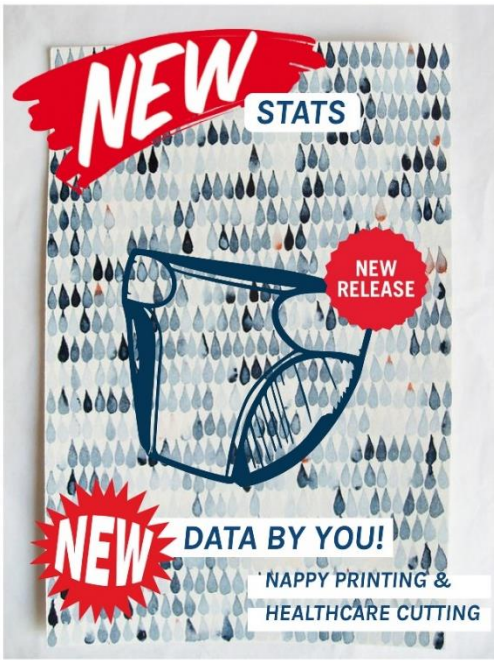
[25] In the work with Cliff Hammett, we were able to develop technical components to produce data ourselves from bodies due to the technical skills Cliff brought to the collaboration, and similarly, working with Loes, we explored different graphic routes, such as the graphic story where I produced the content and Loes designed the graphics. We were able to make use of the technical team at her university, use their servers as well as the Makers Lab for producing prototypes and receiving production support. Practically, the collaborations provided me with a fixed project time to develop the practice-based elements of the research, and the skills and concerns of my collaborators both challenged and enriched my research methodology, such as for example Loes Bogers' work on algorithmic bias and critical making and Cliff Hammett's work on data capturing devices (GSR and algorithms). The collaborative process provided access to works space such as HvA in the Amsterdam (NL), institutional support from The Museum of Contemporary Commodities, Art Centre Nabi, The Visual Methodologies Collective, materials, travel funding and small artist fees.

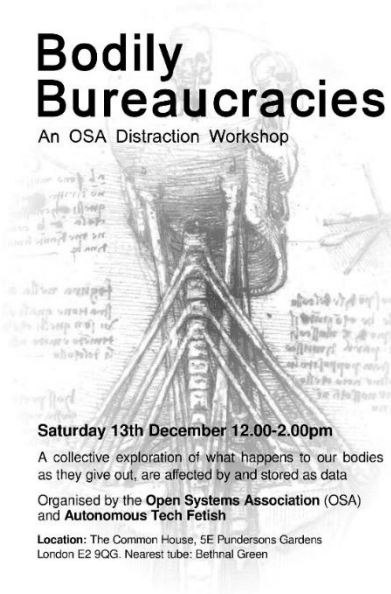
[26] This has also been addressed in the workbook *Training for Exploitation?* By the Precarious Workers Brigade which includes a range of tools to address precarity in the cultural sector from unpaid internships and student debt to professional practice terminology (Brigade 2017).

These resources are necessarily gendered because concepts such as time, emotion and access to income have diverse material and lived realities depending on the person's socioeconomic situation, responsibilities and health. Earlier feminist collaborative practices, such as *Photo Therapy*[27] developed by Rosie Martin and the late Joe Spence in the 80s, brought emotional and self-developing aspects of artist collaborations to the fore. The point of the collaboration is not to address an exterior political problem, but to build relations that are strong, vulnerable and flexible enough to sustain learning and development for the individuals involved as well as for everyone to become a participant in the decision making and maintenance of collective identity and its public life. Much like Martin and Spence, my collaboration partners have been close friendships which allowed the projects to develop for/or against/within the boundaries of those relations. We brought the collaboration into contact with our living environments, such as the home, by working in the presence of children. We accommodated for the often invisible but high costs of childcare in our project budget and practiced acknowledging the presence of health problems, giving space to uncomfortable feelings of anxiety, low self-esteem, lacking skills, physical pains, lack of money, time, sleep and worries as well as disagreements. The movements of working between friendships, home and research expanded the artistic collaboration as a space in which a real living person could exist.

[27] Photo-therapy was an experimental format of collaboration between Spence and Martin, who examined how to use photography and performance as a way to work on the *psyche* and as a way to travel into other dimensions of personal history, process family relations and access the unconscious through photographic practice.







Hungry for information or suffering data indigestion? Join **Autonomous Tech Fetish** as we explore how we consume data and how it consumes us. We'll present a series of artworks - 'data dishes' and 'cutlery contraptions' - produced from local data. It will be refreshing, different and fun!

Location: **FabLab Devon in Exeter Library**
Castle Street, Exeter. EX4 4PQ

Dates & times: **2.00 - 17.30 Fri 20th May**
10.00 - 16.00 Sat 21st May

Figure 6. Autonomous Tech Fetish, *Workshop Flyers*, design by Cliff Hammett, and Larisa Blazic, 2014-2016. Body Recovery Unit, *Workshop Flyer,* design by Loes Bogers, 2017.

The collaboration helped articulate the different strengths and weaknesses, and I developed an understanding of the possibilities of redistributing emotional, financial, time and space resources within the artistic practice. It is not that we found all the solutions in the collaborations to deal with all of these concerns, but we began to build ways of expressing individual needs, expanding what is "allowed" within artistic collaboration and reflecting on the different underlying economic, social or emotional circumstances that people negotiate in their life.[28] The collective foundation of the research provided me with a secure and social context for the sometimes contrasting processes of experimentation and critical reflection, while emphasising that lived experience is a form of knowledge in itself.

Doubtful Forms of Knowing

In the process of developing a practice based experiential methodology of data, I focussed on data *experience* and *practice*. Borrowing from Tess Cosslett, Lury Celia and Penny Summerfield's feminist methodology, the research is

> […] less a search for the correct epistemology than a methodological concern to reveal the complex autobiographical underpinnings of feminist research. If, as feminists have argued, all research is situated, and pure objectivity is pretence, it is ethically and politically right that feminist researchers should lead the way in coming clean on the way research is produced and lived by those producing it (2000, 13).

[28] I understand the role of the collaboration as both as a personal support system in the context of neoliberal academia, described by Rosalind Gill as a culture of normalisation of illness (Gill 2009), as well as a relevant political form for contemporary artistic production. The professional practice terminology within artistic practice pitches the artist as a specialist producer of cultural products, whose isolation individualises precarity and financial instability that underlies cultural work. As such, collaboration serves an individual connection for learning and support, as well as a form of objection to the production of neoliberal culture.

Working on the idea of *data experientially* with no firm empirical ground under the research, my ears became skilled in listening for ways that data is experienced. While I did not make any explicit artwork around the long and short conversations I had with people about their data experiences, they played a central role in developing my understanding of how data is embodied. These conversations that often happened, improvised in the corridor of my son's primary school, at a local community meeting, at a conference or in public meetings about school governance, healthcare funding and maternity, were little building blocks in the research. Informal, yet important, they revealed to me how data is used and experienced in everyday life, and they deepened my understanding of the urgency of data, not just scientifically or politically speaking, but also in terms of the daily lives of healthcare workers who are drowning in paperwork, commissioners who must produce data as evidence to commission care and parents who are scared to enrol their children in school because of how migration data is shared with the UK Border Agency.

These conversations helped give context to formulating an idea of *data experiences*, despite the fact that data often cannot be experienced directly. While the introduction of the GDPR created more awareness for how data is used, the actual extent of how and by whom anonymised data is appropriated is often hard to identify.[29] Sometimes data is experienced because it triggers a reaction in a larger system of databases, as seen with the inclusion of migration data in the national school census which parents in the UK were obliged to provide, leading to cases where children's migration data was shared with the Home Office,[30] consequently putting families at risk of deportation. Other

[29] With the GDPR legislative changes to data protection in 2018, it became a legal requirement for businesses and public institutions to disclose what data they collect from individuals and how this data is used by obtaining consent for individual purposes.

[30] Being involved in activism to let parents know about the data collection and push local schools to inform parents about the new legislation, the work created based on the campaign Against Borders for Children (ABC) was important because of their resource packs, and I connected with other people that work to protect children's data, such as the organisation Defend Digital Me (UK).

times, data is not experienced at all before it is revealed what it has been used for, such as the when the Cambridge Analytica scandal hit the media, exposing that Facebook had misused thousands of users' data. Often big media stories do not match up with first-hand experiences because, as opposed to the media stories, these forms of *knowing* are filled with doubt, paranoia, lack of words and uncertainty and often stem from being kept in the dark in regard to how one's individual data is actually used.[31]

The decision to explore data as *practice* was influenced by the opportunity I had to talk to medical professionals, midwives, administrative staff, programmers and commissioners in healthcare, whose accounts of data revealed various practices of producing, handling, using and circulating data within the context of care. These conversations brought out the practical reality of healthcare data, which reveals the many ways that digital, material, manual and social processes are intrinsically entangled when looked at from the perspective of how they are used. The time that people working in healthcare took to look at the artworks produced from the research gave me further insight into how the artistic work might be positioned within the practical and social fabric of the healthcare context, and as such, allowed for a conversation to happen through the research. Developing *doubtful forms of knowing* as a method was only possible because of these informal networks and relations that encouraged this non-knowledge to be affirmed as a form of knowledge itself.

[31] Being a part of collectives such as Autonomous Tech Fetish (ATF), Open Systems Association and The Body Recovery Unit (BRU) provided a home for such doubtful forms of knowing by working alongside other individuals who are committed to identifying intrusive corporate data practices and to developing counter-technologies and security practices. This helped me to situate my own experiences in a context where technical skills are culturally defined as male activist spaces and media stories are often narrated neutrally beyond the terms of gender (Misa 2010; Henn 2014).

A Starting Point for Methods: Bodily Forms of Knowing

The development of artistic strategies to explore further data as embodied through experience and practice was considered in a series of workshops in collaborations with ATF (2013-2016) and the running of the *Make and Do* workshop series (2014-2017), where I co-designed and facilitated the workshops *Queering Computing* (2014), *Bodily Bureaucracies* (2015), *Body Metrics* (2015), *Data Cookery Class* (2016) and the exhibition project *Data Buffet: All You Can Input* (2016) with artist Cliff Hammett. I will discuss the workshop *Bodily Bureaucracies* (2016) because it was developed to offer a space and process through which everyday experience of data could be articulated. Participants were invited to bring a "data monster" from their everyday lives to the workshop. The monsters ranged from mood metric reports from UK nurseries profiling toddlers to credit score papers, and from performance reports from work to stories of job seekers who juggle entering the "right" and "wrong" data into newly automated benefit systems. The diverse sets of problems that people experienced with often mandatory data practices in their life did not reflect the media scandals of data misuse and surveillance but instead called upon the language connected to daily routines, spaces and activities. This insight was developed in the design of a social mapping game by Hammett and myself, where these gaps were spatially produced on the floor where the game took place. Participants were invited to move their bodies across the axis in response to a series of statements depending on their experiences and feelings. When everyone had found a position on the floor along the x and y axis, representing their experience of feeling of safe/uncomfortable and having personal

experience with/having no personal experience with), each individual shared their positions with the group.[32]

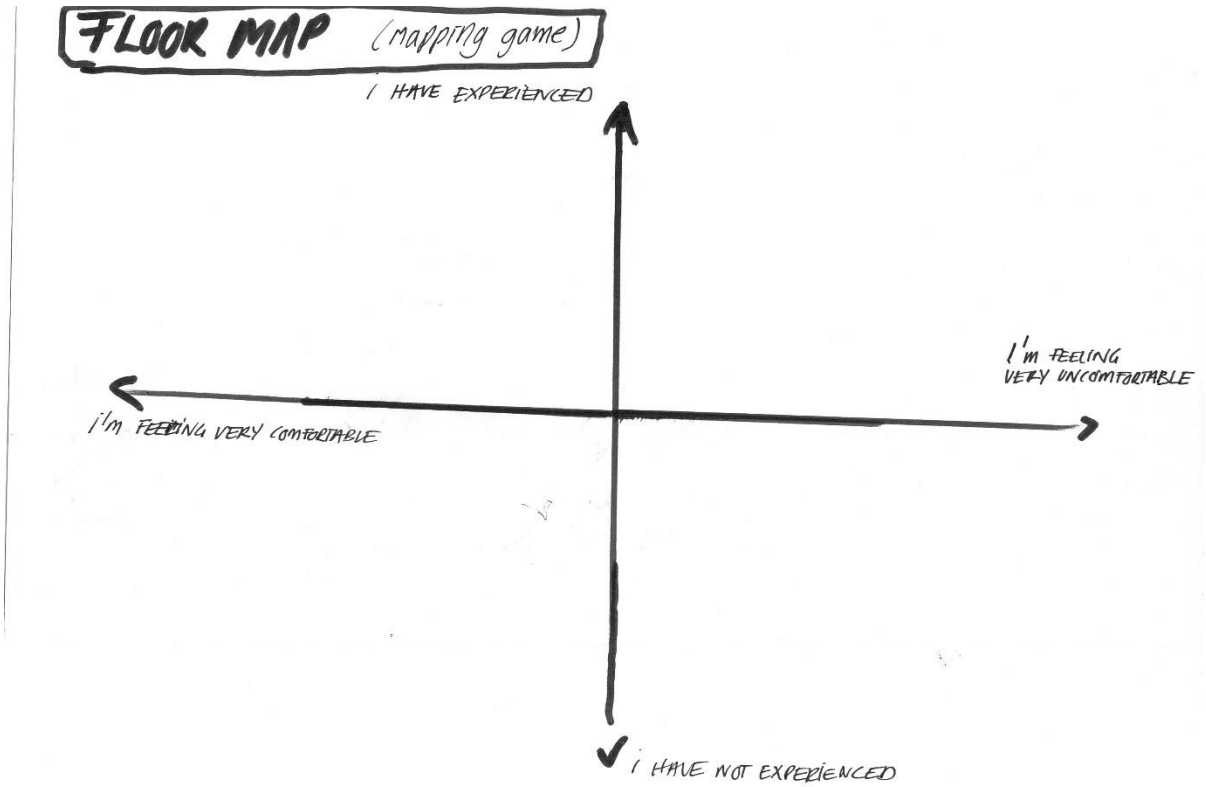


Figure 7. Alexandra Jönsson, *Floor Map* (for mapping game), sketch, ink on paper, 2016.

- Google knows when I sleep.
- Here are the legal limits within the EU as to how my data can be used.
- Airport security is dangerous.
- Using secure browsers is important.
- Racial profiling is real.
- My data will probably not be read by a person, only by a set of algorithms.

[32] The mapping game was adapted from an existing workshop model called spectrogram, which is a conversation starter game to get people to discuss what they *know*. In our workshop, we adapted the spectre to what we *feel* instead of what we *know,* and added a second axis of *experience*.

- The police and security services look at my metadata, but not the content of my messages.
- My online data is analysed to predict my future purchases.
- At nursery/school, my child's conduct is recorded in a database to highlight issues and monitor standards.
- Airport bio scanners are necessary.

The movement of participants along the axis on the floor produced a bodily account of how new technologies are experienced in this moving space of uncertainty; many of the participants had a high level of knowledge about how surveillance is organised and functions technically, but struggled to pinpoint the experiences and contexts in everyday life where such activities might take place. The opaqueness of how/when data is collected can be effectively used by commercial businesses and governments, which is often enforced by the construction of a digital discourse using abstract, militarist and corporate language that actively dislocates questions on data from the sphere of everyday life and individual experience. For the individual, however, these experiences of *not-knowing*s are actively experienced within the body as uncertainty, anxiety or doubt about when data is captured and where it goes. In order to identify these bodily experiences in connection to the larger political, material and administrative ecologies of data, I developed drawing and collage techniques to navigate data ecologies in and around the body.

Mapping Data Context

In commercial data visualisation methodologies, mapping refers to the process of translating computational data into a visual field in the aid of human cognition. D'Ignazio draws on Donna Haraway in her analysis of data visualisation practices by arguing that the way that visualisation technologies are used omits their own position of power. The process of concealing the "knower,"

what Haraway called “The God Trick,” puts visualisation practices at risk of knowing everything from a place of nowhere.

> The eyes have been used to signify a perverse capacity—honed to perfection in the history of science tied to militarism, capitalism, colonialism, and male supremacy—to distance the knowing subject from everybody and everything in the interests of unfettered power. The instruments of visualization in multinationalist, postmodernist culture have compounded these meanings of disembodiment (Haraway 2004, 86).

D’Ignazio points to how data visualisations are used, as she writes “[…] even when we rationally know that data visualizations do not represent ‘the whole world,’ we forget that fact and accept charts as facts because they are generalized, scientific and seem to present an expert, neutral point of view” (D’Ignazio 2015). Challenging these forms of knowing, she argues, is an intersectional feminist issue, because perspectives, concerns and experiences of women and minorities are *not* considered inclusive to “neutral points of views.” While the infrastructures that define how data can be produced, and the ways it is analysed and used are important to understand what purpose the data itself serves, disembodied data methodologies do not allow for such a perspective.

In the practice-based projects, I use the concept of mapping as a way to conceptualise the context for how data is experienced, and practically speaking, that means mapping the environment of data production in relation to bodes. I focus on how to draw a data producing body in the context of healthcare in a way that identifies the machines, infrastructures and practices that operate in the background of the healthcare system but nevertheless determine how a body is digitalised.

In the projects *Welcome to the Maternity Ward, Allocation of Reproductive Care Responsibilities, The National Catalogue of Savings Opportunities* and *Nappy Printing & Healthcare Cutting* created with Bogers, I work with a visual drawing system to map how bodies are defined by the healthcare system

through using publicly available records, policies and data. We draw on the methods by YoHa, whose practice-based "critical technical" approach focus on the analysis of databases as social and political organising principles instead of the data itself.[33] I build on this strategy in the work on maternity data to create a visual mapping process of how maternity records, commissioning processes and cost optimisation polices affect individual bodies, bringing the rules and infrastructures that are often imperceptible within the care setting to the fore. Geoffrey C. Star and Susan Leigh Bowker argue that the processes of classification are both organisational and informational, always embedded in practice, as such they are themselves powerful technologies that when "[...] embedded in working infrastructures they become relatively invisible without losing any of that power" (2000, 319). These processes could also be understood through Matthew Fuller and Andrew Goffey's term "grey media" (2012), with which they define a type of technical object, such as the model of a relational database, the corner of a shipping container, a piece of software or a post-it note, that structures an organisational process and often operates in the background (Harwood 2019, 34). To YoHa, exploring grey media is in the interest of the public because these objects structure processes beyond their technical functioning and model practical, social and material processes around their own operations. YoHa use artistic methodologies to map how such objects reconfigure their environments in what they call *public enquiries* "[…] where the flows of power can be reconfigured by uncertain meaning, or intention of art—not necessarily to make art, but to make use of its ambiguity within a wider enquiry" (Harwood 2019, 31). In terms of mapping the context of maternity data, this becomes specifically a feminist issue in terms of identifying how the boundaries of a reproductive body are defined by data infrastructures, and in turn, how data captures of pregnant people's bodies are used.

[33] Key works through which this method has been developed includes: *Database Addiction* (2018), in which an addictions database is reverse engineered to examine who has access to what data in it, their work on the birth record *Database Documentary* (2010), *Data Entry* (2011) and the project on council expenditure databases *Expenditure Rider* (2012).

The use of this mapping method allows for the artistic practice to have social agency due to the way that it gives a visual language to the unpacking of the opaque domains that a person's data travels through in the healthcare system.

Body Mapping

I use figure drawing as a visual system to develop the body maps that contextualise infrastructures, machines, postures, movements and labours of data production. Throughout the projects, I move from using a standard Western life drawing system of reproducing the body as a visually fixed site in cartesian space, such as in the projects *Life Drawing the Attention Theft* and the body maps *Movement Drawings, The Allocation of Reproductive Care Responsibilities, The National Catalogue of Savings Opportunities, General Digital Pain,* and *Hardware Specific Pain,* to using collage as a method in the projects *Data Collage* and *Repair Maps.* Western life drawing practice across Europe was exclusively white and male until 1883, the first year that women could attend figure drawing classes at the Royal Academy in London, prior to which they were only allowed in class as naked models. This coined life drawing as a visual practice through which women were produced as objects of desire, and the movement and representation of bodies were framed by the interest of male professionals. In the projects on maternity, *The Allocation of Reproductive Care Responsibilities* and *The National Catalogue of Savings Opportunities,* I map the relation between data infrastructures and usages in relation to the body as site using the figure drawing methodology. However, when I began to map the labouring body that moves habitually and non-consciously through body actions and postures in the projects *Life Drawing the Attention Theft, Movement Drawings, General Digital Pain* and *Hardware Specific Pain,* I found the life drawing methodology limiting to further developing these projects because of how the body is demarcated as site. I wanted the movement of the body and its continual reorganisation by the effects of data work to come into the artistic process itself, which the

life drawing method did not allow for as it produces the body as a clearly predefined site, frozen in time and space, and therefore fully comprehendible and possibly controllable. This view is one that is never experienced because experience itself is dependent on movement and change. I therefore explored the potential of the collage as a method to examine the body as process from the partial, open and moving perspective of feeling.

Collaging Repair

From data entry workers, coders, transcriptionists, content moderators, gamers and prosumers, the digital is created, maintained and taken care of by new forms of labour that rarely figure in how big data and AI are conceptualised. By approaching the body as a site of repair, the bodily manifestations of digital work can become a resource in taking stock of the occupational hazards of new capitalist economies such as surveillance capitalism. Collage as a method allows for bodily manifestations of precarity, anxiety or physical pain to enter the process of constructing an image of the body as a moving site. Rather than mapping the body from outside, the creation of collage from feeling, enhances the individual capacity to define body boundaries by reinforcing what is *felt* in the body as real. While the collage strategy departs from an activity of mapping individual bodies, the method shows how bodies are collectively defined by work in the digital ecology. The functioning of the maps evolves around recuperating and caring for the body parts or boundaries that are at risk of being transgressed with pervasive digital structures emerging in both personal life and professional fields. The artistic practice can therefore be seen in relation to the concept of *self-reproducing movements* termed by Barbagallo and Federici in their introduction to *Care Work and the Commons* (2012).

> We believe that it is important to engage in this analysis because the struggle over "reproduction" is central to every other struggle and to the development of "self-reproducing movements," that is movements that do not separate political work from the activities necessary to the

> reproduction of our life, for no struggle is sustainable that ignores the needs, experiences, and practices that re-producing ourselves entails (2012, 2).

Through the movements of noticing bodily pressures of data work, I explore how these experiences can establish a starting point for thinking about collective forms of care. In the installation *Accumulative Care,* I explore how to create a shared format by making the body maps audible in the creation of a series of audio relaxation exercises where individual experiences can be listened to as one body. Rather than defining the pains and pressures of data work, the artistic method of creating repair maps becomes the visual process of identifying pain and expressing it becomes a way of naming the relationship between individual bodies and the larger structures of the data economy, that in part, are sustained by these kinds of invisible labour. The mapping of the bodily work that goes into the production of data precisely centres what representative methodologies of data in the field of art and technology omit, namely the body as the very resource of data production. The care methodology produces new questions on agency within the artistic practice and on the power relations that are created between the projects, participants and contexts of the work, which I will now explore in relation to the public formats I have worked with in the research.

Public Formats of Knowing

Throughout the individual projects, I examine how the processes within the research can be shared with peers, the public or specific community groups through socially engaged forms.[34] Because of the formats used in art and technology practice often evolve around the presentation of an object or

[34] I use *audience* to describe the specific or non-specific group of people that the projects are designed for. I use *participant* to describe the audience if they are actively participating in the making of the work, such as in workshops or other event-based work. I use *viewer* to describe the role of "looking" at artworks, which is often the role assigned to new media art audiences.

visual output, the context of this art is often the gallery space, screens or online spaces. These contexts bring their own social, economic and material frames that the artistic practice is articulated within, just as the relation between the viewer and the artwork is defined by the role of art in this context. I therefore explore how artists in the field of socially engaged artistic practices have considered the relations between artistic practice and its social context in a range of different ways that go beyond the passive role of looking at an artwork or interacting with the work through technical gimmicks.

I make use *public formats of knowing,* such as the workshop format, intervention and installation to explore the different ways the artistic space holds the potential to create a structure, process or space that is shared. In the workshop series created with ATF, the focus of creating a shared space evolved around the sharing of everyday data experiences, while later workshops such as *Data Collage* created with Bogers, were focussed on exploring physical processes of digital labour as an engagement format for the workshop. The development of the installation *Accumulative Care,* a space constructed as a collective care space, allows the participants to create meaning in relation to the installation by engaging with the space using their bodies.

In the project, *The National Catalogue for Savings Opportunities*, I more specifically focus on the social context of healthcare and how to develop a process that addresses the perceived gap between people and their data and how this is used. The outcome of the project is a miniature booklet designed for the maternity ward with a specific audience in mind, namely families expecting a baby, as a gesture to connect people with how their data is used. While each of the projects can in theory be experienced by the wider public, I focus on developing the work as an investigation that might offer a response to individual experiences or a broader social and political context. This is also why I

prioritise developing the projects in connection with relevant live contexts, such as the maternity ward or the waiting room or in public spaces, such as cafes, libraries and meeting spaces.

I draw on how *the context* has been conceptualised by artists in the field of socially engaged practice, such as with the Artist Placement Group (1966-89),[35] who enabled artists to work in public institutions and industries (Henning and Jordan, 2016). The group's statement, *context is half the work,* describes the spatial and ideological shift of moving artist practice out of the studios and into the institutions of society, rejecting the practice exclusively focused on making objects and turning to information, public sites and social relations as the matter of artistic knowledge and practice (Group 2016). Later, groups such as I-O (1989-2009) and the Incidental Unit[36] continued the significance of developing critical thought as part of socially engaged artistic practice, which as a model of practice was critiqued by the artworld as an artistic genre providing social solutions for the welfare state.[37] The broader field of public art contributes an important counter position to the institutionalised artistic frames, such as the *white cube*, because it destabilises the idea that such spaces have to be at the centre of how artistic practice is defined. While the work of The Artist Placement Agency and YoHa have situated

[35] Founded by artist Barbara Steveni, Barry Flanagan, David Hall, John Latham, Anna Ridley and Jeffrey Shaw.
[36] Created by Barbara Steveni, Neal White, Tina O'Connell, Gareth Bell-Jones and Marsha Bradfield in 2016.
[37] Claire Bishop (2006, 20) addresses the rise of participatory art since the 90s (socially engaged art, community-based art, experimental communities, social practice) and problematises the relationship between public funding structures in the UK, where socially engaged artistic practices are appropriated instrumentally to regenerate populations, risking subsuming artistic under the functions of social work, counselling and volunteering. She argues that these formats rely on models of Cristian saviourism, shifting the production of art from a *conceptual* framework to an *ethical* framework of which she is deeply critical. She proposes an anti-humanist approach for thinking participation in a move to trouble the political instrumentalisation of socially engaged practices. The work of artists groups such as IO, APG and YoHa unpack the multiple material, technical, and social positions that can be activated within socially engaged artistic work by examining the technical, administrative and economic context they operate within. This offers a way to contextualise the artists role within the context, instead of seeing the artists as a neutral agent, which sometimes Bishop's argument tends towards. The risk of Bishop's argument is the positioning of other "non-socially engaged" artistic practices as non-political, when in fact any practising artist is already operating within economic and cultural privileges or bias of their social and spatial context. Nevertheless, the specificity of how artistic practices are instrumentalised in different ways, from the capitalist market of contemporary art to the art-washing of corporate brands, and the uncritical use of public "community outreach" models, can beneficially be examined to refine the debate on the production of social forms within artistic practice.

artistic practice in public, industrial and administrative contexts, feminist practitioners such as Ukeles, Rosler, Spence & Martin and ORLAN conceptualised the domestic processes of menial labour, maintenance and care as relevant sites for artistic practice. Here, the artistic practice is not only producing value within the economic frames of contemporary art, but also takes everyday life as a site for identifying, resisting and treating the lived experiences of a range of topics such as the labour of childcare, trauma, relations and discrimination. These socially engaged practices positions artistic practice as an agent of personal transformation and change by pointing to the ways of claiming what is already lived as real. This was an important point of reflection for developing my own practice in this context and to think about the socio-material form of the connection made between artistic practice and people coming into contact with it. In the project *Accumulative Care,* I explore how this connection can be developed on several levels in terms of co-creating the work with groups of people. The care installation with the relaxation exercise series for data workers can be experienced by anyone but might connect more profoundly with audiences who have experienced the specific forms of work that the relaxation exercises is based on. In this way, I explore how socially engaged formats can operate as both investigate and affirmative for the individual as a form of self-knowledge, and collectively, as a way to address concerns that might be shared.

CHAPTER 5

PRACTICE-BASED RESEARCH

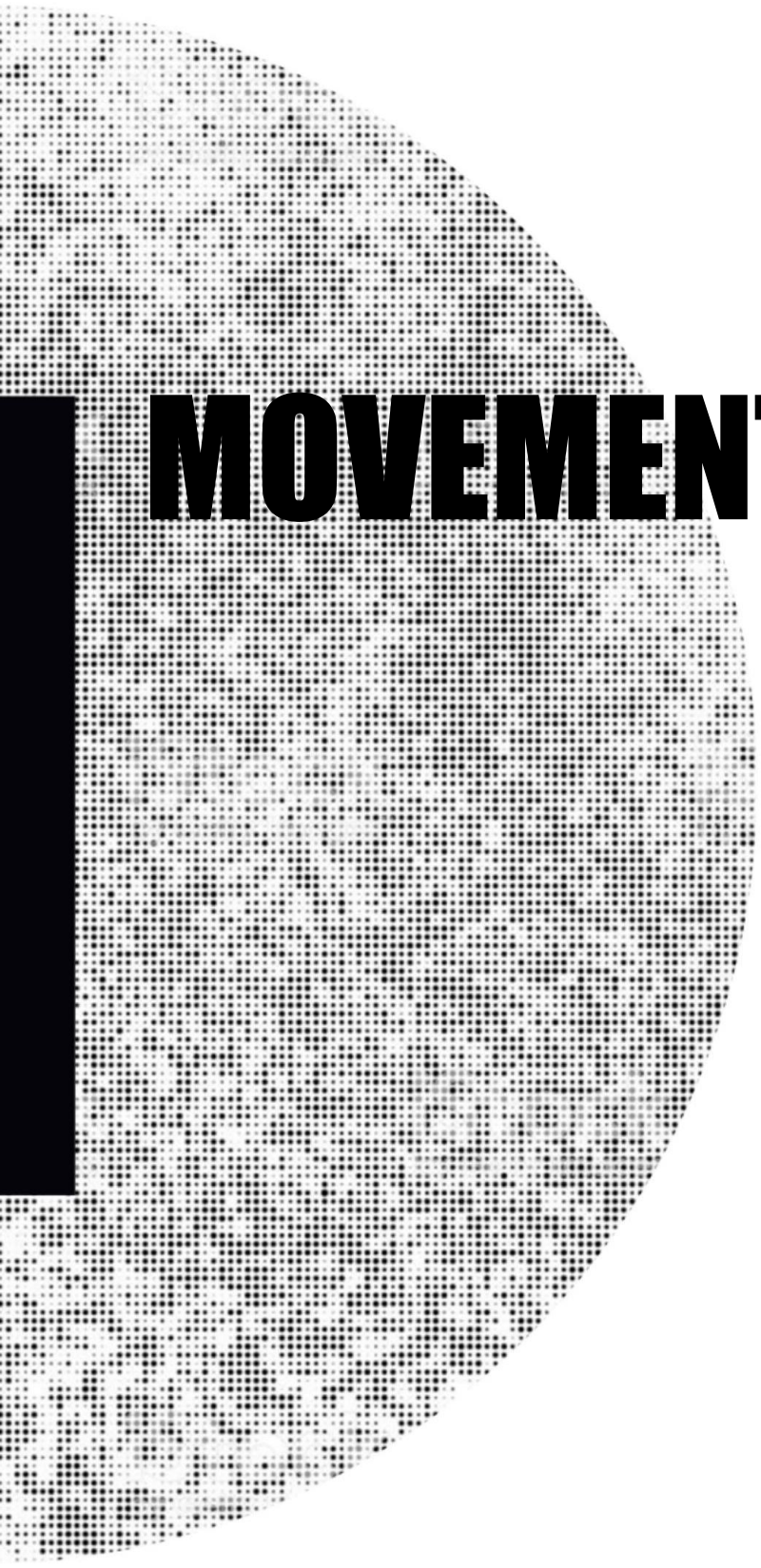
Through the following four chapters *Movement, Capture, Labour* and *Care,* I will discuss the practice-based research and qualify how they respond to the gaps identified in terms of artistic methodologies in the field of art and technology and position the artistic practice as investigative of the social and body political agency of data. By moving across the context of social media platforms and its associated media habits, as well as the context of healthcare, I examine how extractive data practices are positioned in relation to its bodies, and their labour.

Following my research questions, in the first chapter *Movement,* I explore the question: How can concepts such as the *labouring body* allow for data to be understood through lived experience and practice? Through a series of drawing experiments, the relations created through the use of digital technologies choreograph the body to move and pose in certain ways. By framing data as a question of body actions and practices, can the movements of the body create a new embodied perspective to take stock of the operations of corporate social media?

I take this starting point with me into the next series of projects discussed in the chapter *Capture,* where I examine how looking at data technologies from the perspective of healthcare positions data as a practical process of collecting, analysing and using data from and around bodies. Here I explore the question: How can feminist methodologies of care and maintenance contribute to shift the focus of artistic practice in the field of art and technology away from representative forms of practice that reinforce the lived experience of digital systems? Drawing on body mapping methodologies of the data systems and processes within maternity that define reproductive bodies, I explore how the artistic process can become a site for examining data that are produced from bodies or capture bodies in the way that they work. Focussing on mapping the infrastructural terrain of data produced

within the context of maternity, the practice-based research explores how to connect people with the data they produce.

I go on to discuss data production as a form of free work more directly in the chapter *Labour,* where I look at expanding the way that bodies are thought of in relation to technologies by drawing on the experience of data workers. Here I come back to exploring how the body is moved through different forms of data work, experimenting with a range of ways to centre the artistic practice around the interest of workers, rather than technology users, and as such, bring a critical perspective to how artists have traditionally used digital data as a context free and neutral matter. In the last chapter *Care,* I address the last research question: How can socially engaged practice in the field of art and technology become investigative for the individual in terms of relearning the extent of the body as it is digitalised as well as collectively identifying how digital technologies are a part of the body and its movement? In the last chapter I discuss how exploring care as a format within an art and technology practice enabled me to develop a collective strategy for taking stock of the digital from the body as site.


MOVEMENT

The separation of material and immaterial labour has historically enabled capitalist economies to access free reproduction of the labour force because immaterial labour, such as care and domestic work, goes uncounted. Barbagallo and Federici point to the feminist movements of the 1970s where immaterial labour was foregrounded in political theories of organising and "[…] redefined as work that produced labour-power and, as such, a precondition for every other forms of capitalist production" (2012, 5). [38] As such, they suggest that material and immaterial labour has to be considered alongside one another, to resist the capitalist erasure of care work:

> This new feminist perspective rejected the common assumptions that domestic/care work is a personal service or a pre-capitalist form of labour, redefining it, instead, as a key aspect of social reproduction in capitalist society and value-creation. To posit housework as work that re/produces the workforce revealed the immense amount of unpaid labour at the heart of the wage relation and had a liberating effect especially for women. By unmasking the capitalist function of this work, by showing that domestic work reproduces us, but for the most part is performed un-der conditions not set by us, it helped dissipate the sense of guilt that women have so often experienced whenever they have wanted to refuse this work (2012, 5).

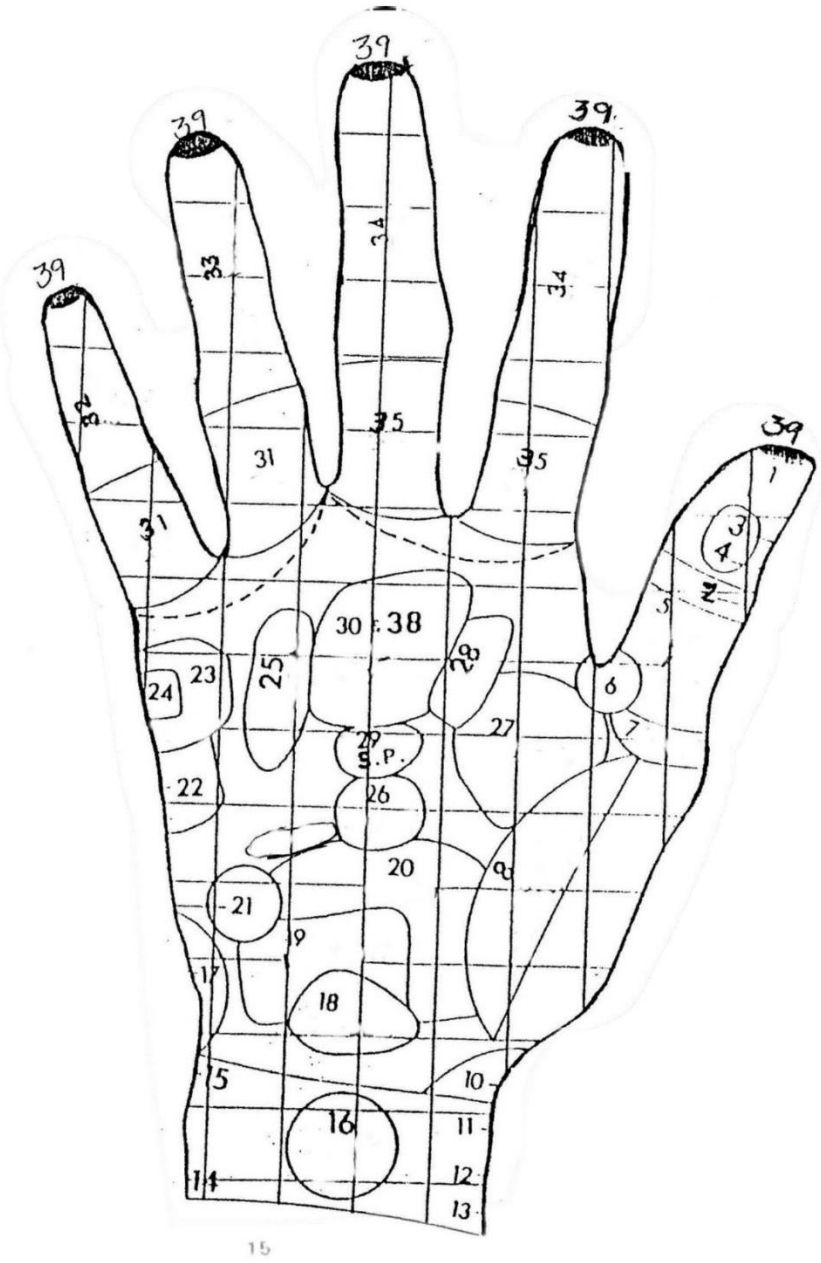
Much like domestic labour became "uncountable" through the oppressive structuring of domestic work as female, digital work is created to be invisible, and as such, is an uncounted resource that corporations feed off freely. Zuboff articulates this resource as the *behavioural surplus* of surveillance capitalism, where free access to users' behaviours and actions becomes the source of data collected for the making of predictive products (Zuboff 2019, 63–68). The way that consumers and networked behaviours are monetized is often understood instrumentally, but Yasmin Gunaratnam and Carrie

[38] In the introduction for the issue on *Care Work* in the *Commoner*, the authors address how forms of reproductive work defined as the "complex of activities and services that reproduce human beings," including waged and unwaged domestic work, sex work, elder and childcare work, are organised in new ways because of the pressures introduced by the neoliberal restructuring of the global economy.

Hamilton describe this process as an *opening up of us* when they write "how we open an email or our click through patterns does indeed 'open' us, and not just affectively" (Gunaratnam and Hamilton 2017). The following series of experiments ask, if we shift the view from the technical machines towards how engagements happen with them, can we begin to document computational engagements as accumulating also within the body and its movements?

If data produced from taps of the fingers travels to become profit, where does the body begin and end? If engagement with digital technologies settles in your body as "mouse hand," stiff neck or lower backpain, does such ergonomic hardware count as a part of the body and where does the economy begin and end? The first thing that I noticed about data, was that while data itself is often represented as static, a number, a dataset or a whole database, its production requires movement. In order for it to exist, bodies must move. We might think of these movements as movements between bodies and hardware, between bodies and software and between geographical locations that become networked with the production of data. Thinking with Zuboff about the new forms of value production, the movement of data producing bodies, what we might previously have called customers can now be seen as economic movements or movements of resources within the ecologies of surveillance capitalism (2019).

Right Hand Pressure points [and associated value]



1. **Apple**
[$963.33 billion]

2. **Samsung**
[$221.6 billion]

3. **Microsoft**
[$995.324 billion]

4. **Alphabet** (Google)
[$885.97 billion]

5. **Intel**
[$234.73 billion]

6. **IBM**
[$124.08 billion]

7. **Facebook**
[$546.606 billion]

8. **Hon Hai Precision**
(Foxconn)
[$6023.96 billion]

9. **Tencent**
[$462.116 billion]

10. **Oracle**
[$189.37 billion]

11. **Amazon**
[$779 billion]

12. **Liveramp Holdings** (Axicom)
[$2.3 billion]

Figure 8. Alexandra Jönsson, *Right Hand Pressure Points [and associated value],* 2017, sketch, digital drawing.

Artistic Materials: The Moving Bodies Behind Data

In two experiments *Life Drawing the Attention Theft,* a public drawing class looking at digital body poses, and *Cleaning & Scrolling,* a drawing experiment looking at the scale and pace of digital movements, I produce the materials and context for the experiments by capturing my own digital habits as well as asking people in my network to donate documentation of their digital habits. While the value of users' labour on digital applications and platforms are often not visible to the user whose attention is directed towards how they can be served by the digital product, the labour of data production can easily be documented. The materials used for the drawing series of data movement and data postures is based on data from my smartphone usage via an android shadow application[39] that allows me to see when, where and for how long I use different applications on a daily basis. The data from a month of phone use comprised 289 printed pages, which I published in a small book called *Data Book*.[40] The data from this application gave me insight into when and how much I use my phone, which I could connect with parts of my body: screen time (eyes), opening keypad (fingers), closing phone (thumb), scrolling (index and long finger), and so on. By mapping the actual data producing body movements into a spreadsheet, I was able to relate the movements of data work to movements of other forms of work, like cooking, listening, cleaning, reminding and hugging, that have historically been defined as non-work and therefore invisible (Federici 2010). I also wanted to draw on the social contexts that enable data production, so I expanded my production of materials to include images donated by my network of friends and family using their smartphones and tablets.

[39] Examples: Android Apps; Quality Time: My Digital Diet by Computing Global; My Phone Time: Focus Enabler application by Smarter Time; and an employee monitoring software called Aktiv Track, which is an invisible software that sits on your computer and logs everything from your browsing history, keystrokes, productivity, screen activity, etc.

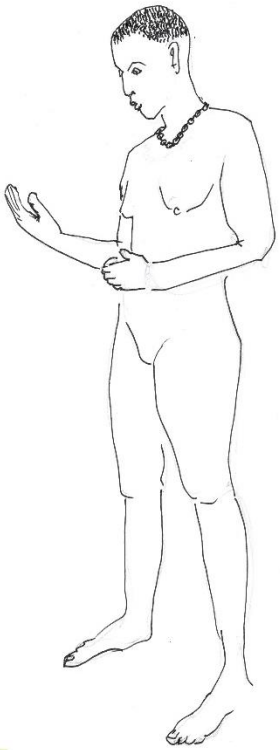
[40] Ironically, the very capitalist premise for the existence of such apps is that they use the data captured from my phone (literally my behavioural data) for profit, while only giving me access to a small number of details. Nevertheless, the app is advertised as a way to "manage" your digital addiction, to detox and to take timeouts.

This comprised a collection of images of people on the toilet texting, relaxing and scrolling, eating dinner and watching television on the tablet, breastfeeding while Facebooking and provided me with a situated starting point for examining the immaterial yet concrete context in which bodies become productive.

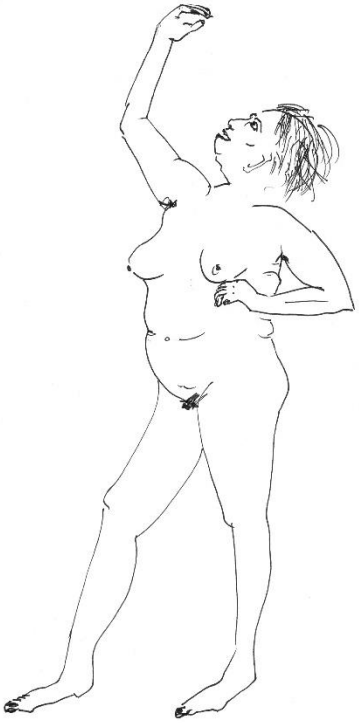
Experiment: Data Postures

From sketches documenting the range of bodily positions that serve the digital interactions of smartphones, tablets and computers in the drawing series *Here…while not here* (2014) to the final life drawing class *Life Drawing the Attention Theft* (2018-2019), this part of the research focusses on the postures that the daily use of digital technologies cultivate. Within this context, the drawing series is based on poses that come from the different ways that data is laboured and how this labour is entangled with other meaningful activities in the home such as breastfeeding while checking Facebook, researching tax laws while on the toilet, singing goodnight songs while emailing, surfing the internet while watching the television, eating dinner while watching Netflix and dancing while live streaming. I collected twelve postures from people using their digital technologies a part of everyday life and turned these postures into poses for the life-drawing class *Life Drawing the Attention Theft* (2019). The class was hosted by Deptford Community Cinema during 2019, and drawers responded to the task of exploring how digital choreography challenges the usual practices of building up a body as a drawer because the specific relationship between transfixed starring eyes, tense hands and fingers and slouching postures of digital technologies reorganise the usual compositions in life drawing. Life drawing itself is a practice of body standardisation that has been used to train a cultural perception of how being human can be reproduced by the human body. Whereas traditional life drawing poses and bodies are often reproducing a historically specific white Western body, it was important to me that the poses disrupted the concept of an abstract body

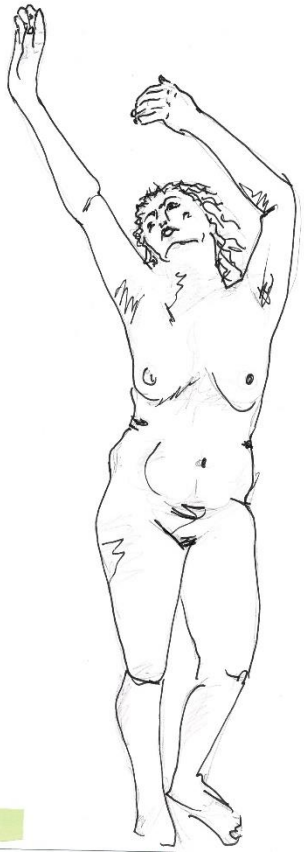
without time and space. I created the postures by tracing the body's poses in the donated photographs of people using their smartphones and removed everything from the image but the body. While using the traditional staging of the naked model in the life drawing class, the poses staged were taken from the *lived* time and space of people's every day, suggesting that everyday practices of breastfeeding, dancing and singing have to been seen in direct relation with the movements that can be harvested as digital value, such as scrolling, texting, tapping and typing. It is in the small but repetitive stalling movements that digital embodiment takes place, not because something specific is accomplished but because they are the processes through which the body drifts off and loses sense of time and place when scrolling through content on Facebook, swiping on dating apps or browsing online, fully surrendering its attention. Often it is the bodies themselves that are an *absent presence* in the discourses and artworks surrounding big data, but it is only by focusing on *how* we do data, by bringing the actions and motions to the fore, that we can question how such movements and postures are capitalised in the digital economy.



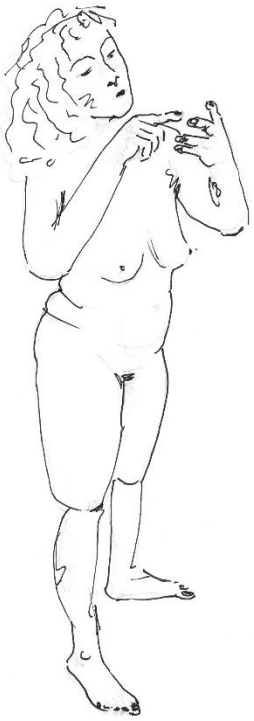
#sharing



#Selfie

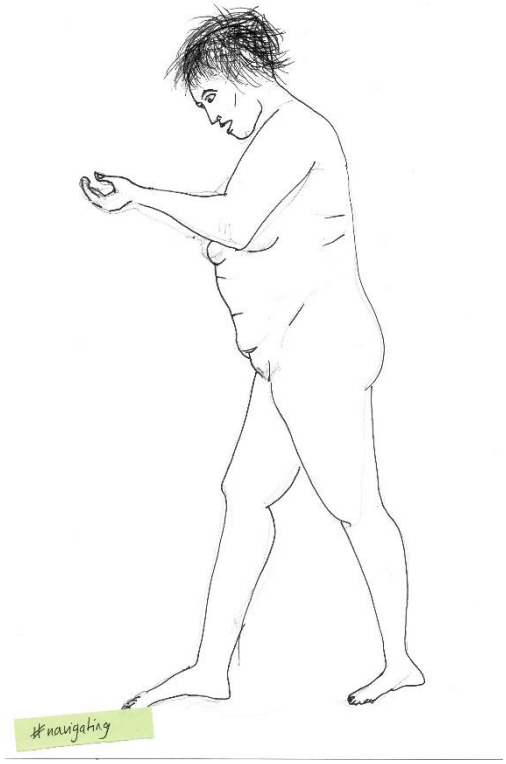


#dancefilming



#Screensharing


#navigating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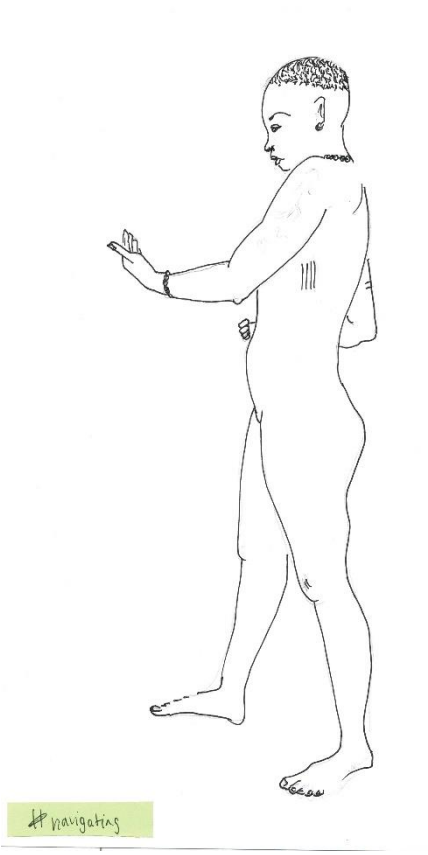
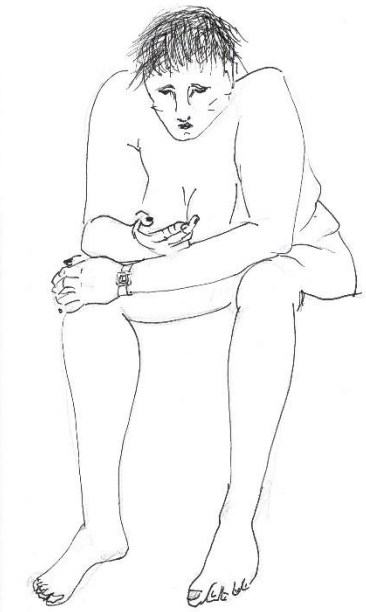
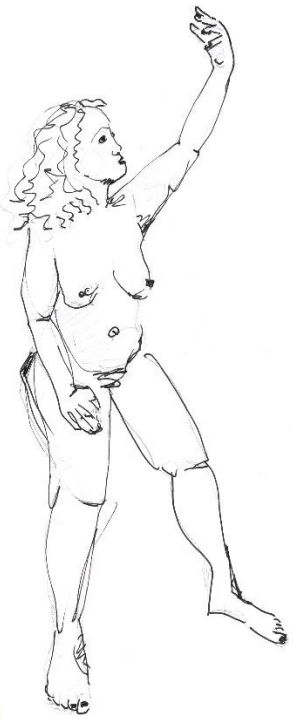

#navigating


#texting

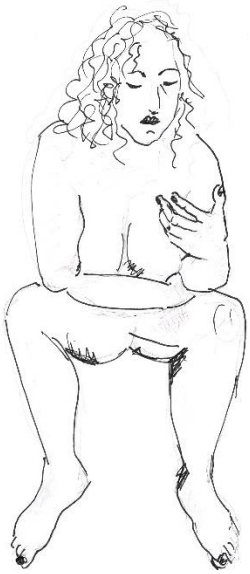
#lookexting



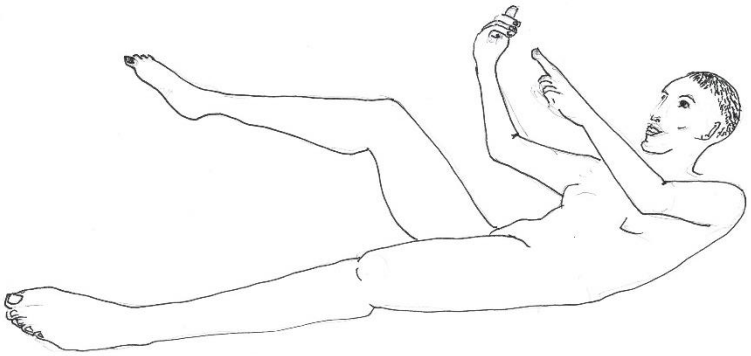
#Lookexting



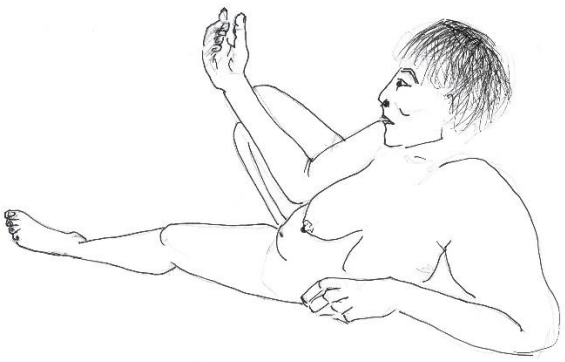
#selfie



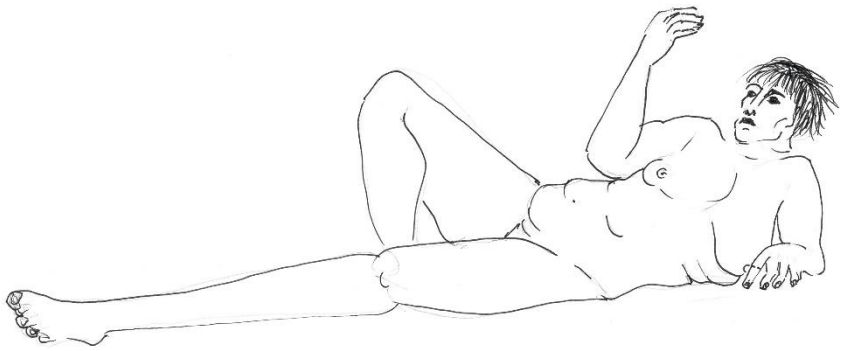
#researchingtaxlaw



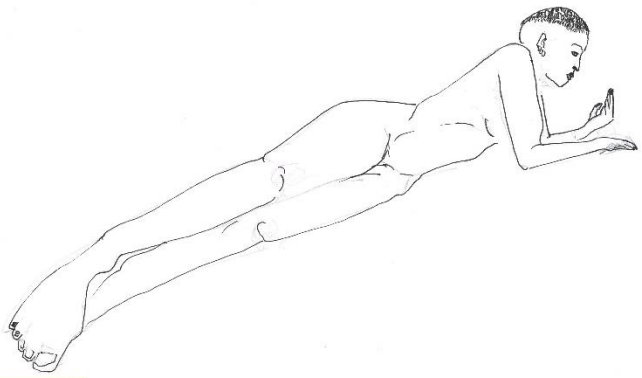
#onlinedating



#pump and surf

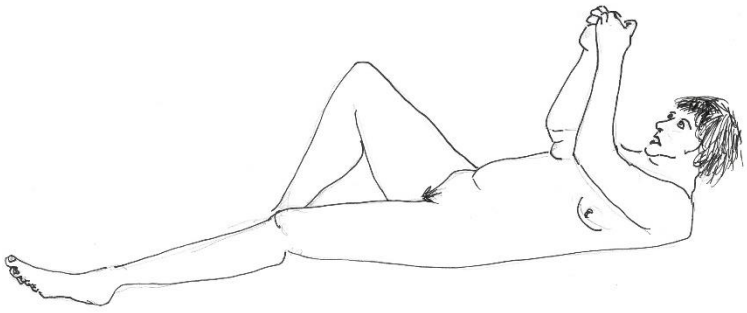


#Pump'n Surf



#watching

#watching telly



#watching YouTube

Figure 9. Alexandra Jönsson, Life Drawing the Attention Theft (posture series 1-21), 2018, ink on paper.

Figure 10. Participants drawings, *Life Drawing the Attention Theft,* in: Body Politics of Data, solo show, London Gallery West, 2020.

Experiment: Data Movements

The experiment *Cleaning and Scrolling* (2014-2016) explores more in detail these unnoticeable yet consuming movements that underlie digital habits such as tapping, scrolling, swiping and texting and how this labour choreographs the scale, rhythm and size of body movement. I decided to take the timeframe of my week as the reference point for examining the daily tasks that I do in the week, along with the movements that they consist of. First, I used a series of sketches of myself carrying out the different forms of domestic labour that I do, including cooking, checking email, talking on the phone, opening my phone, listening to music, liking things on Facebook, cleaning, hanging washing etc. From these drawings, I traced the *movement line* in the body for each individual act, leaving me with two drawings for each action. One which shows my full body as it is working, the other which only shows the movement of my body. The latter reveals the size dynamics of the different forms of labour, showing that the body is moving less while doing digital labour.

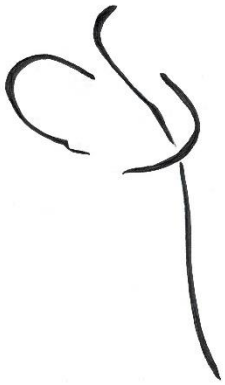
Listening to music

texting

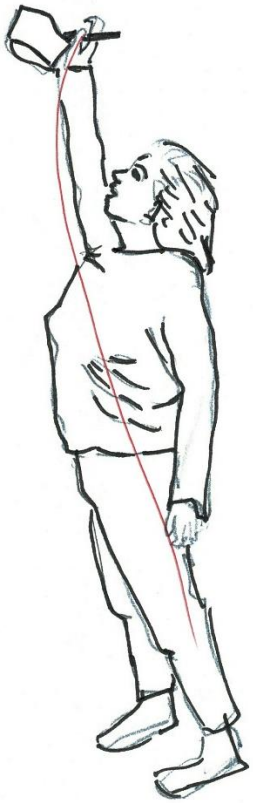
Researching tax law

Googling

hugging



cooking

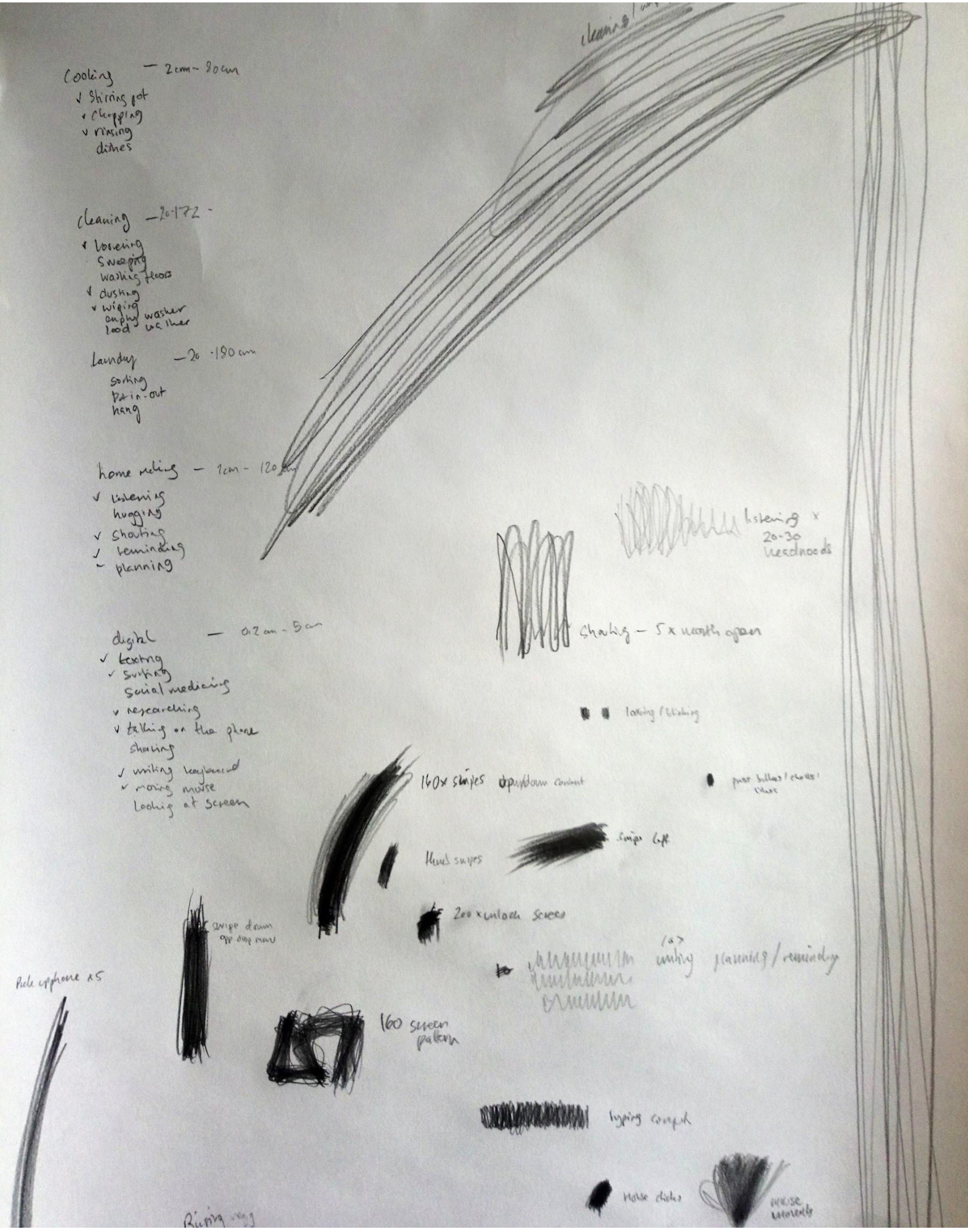


Tidying

Figure 11. Alexandra Jönsson, *Movement Line* (series 1-9), 2014, sketch, ink on paper.

Mapping the individual *movement lines* of labour led me to explore the digital movements in direct relation to the movements of other forms of work. In the experiment *Cleaning and Scrolling,* the different movements that the body does is drawn onto the paper, instead of drawing the movement lines within the body. The *movement drawing* captures the bodily materiality of how these movements are choreographed. For example, when stirring a pot while cooking, which I do one to two times a day, I make a circular movement with my arms to stir the content of the pot in a radius of approximately twenty centimetres, whereas I unlock my phone an average of 211 times a day to check my notification board, which includes pressing the unlock button, swiping my access pattern and swiping down the menu bar, all of which I do mainly with my fingers in a movement space of three to five centimetres. The first experiment, tracing the movement *lines* in the portraits, reveals the scale of body movement in the different forms of work, while the second drawing, *movement drawings,* literally maps onto the paper the movements that my body makes for the different daily forms of labour. In the latter it becomes clear that the data producing movements are radically smaller than many other movements, yet they are much darker, meaning the way they are carried out is done through a high number of repetitive movements.

Figure 12. Alexandra Jönsson, *Cleaning and Scrolling,* 2015, sketch, graphite pen on paper.



The drawing shows the labour of the hand as it compulsively taps, scrolls and swipes as a way of *opening up* the body—often to commercial databases that benefit from the *behavioural surplus* of data that capture the repetitive interactions with platforms. Taking a step back revealed that the smaller finger's movements sometimes induce the whole body into a state of lethargy; while it is not doing "much," its bodily attention is consumed through small movements of eyes and fingers. The key to these interactions is that they are not the meaningful interactions that are valuable, i.e. sending a message on Facebook, but instead it is how the behaviours of the whole body become measurable when it is *open* to being captured through the activities of scrolling, reading, tapping, typing etc. Featherstone argues that the affective body is moved by an *inner sense of body movement* or *proprioception* which can give language to how these small, receptive and seemingly insignificant movements can be seen as a habitual process that

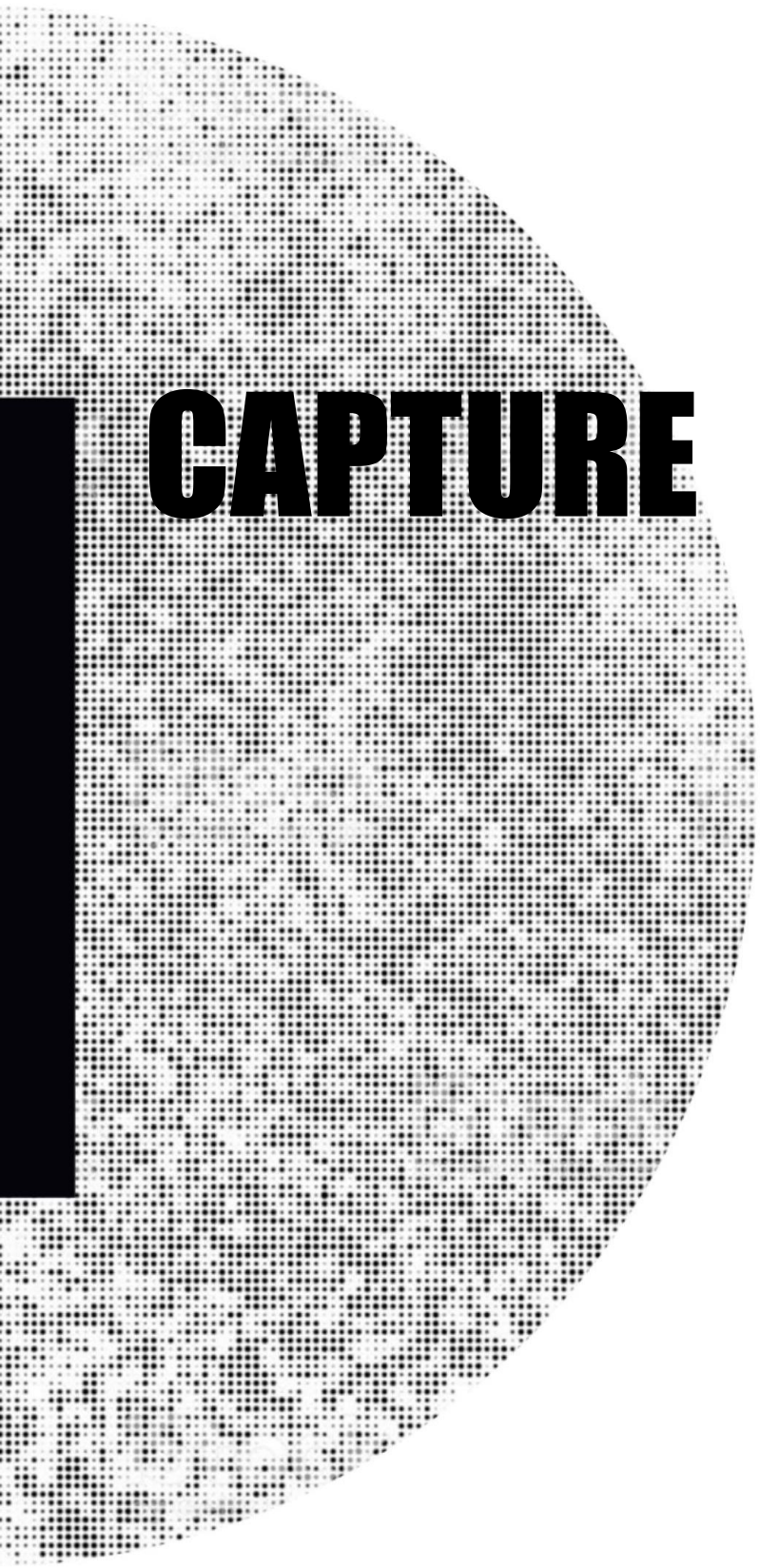
> […] relates to muscles and ligaments, which registers conditions of movement and translates the body's encounters with objects into a muscular memory of relationality, a cumulative memory of skill, habit and postures (2006, 234).

The change in perspective from the portraits (of daily tasks) to the movement-drawings (of movements of those tasks) could be seen as this shift, documenting the learnt behaviours of the body that are unconscious: looking at the whole body, you do not see the accumulation of the small habitual movements that the digital interactions depend on. The particular set of movements that are directly data producing, such as unlocking the phone, checking statuses or looking at the screen are encouraged by the design of apps that constantly send notifications to the display. The production of data might not be visible, but it is not an "inactive" process. Similar to Featherstone, Anna Munster argues that the digital becomes visible in the body's increasing forms

of digital dexterity: flickering retinas, touch patterns and movements (Munster 2006, 62). The drawings show that this digital dexterity is not merely random but choregraphed through certain movements that are repeated on a daily, sometimes hourly, basis. I argue that the direction of attention through the making of habitual, recurring contact with the data producing devices can be understood as the very processes by which the production of big data is levelled through individual bodies, even including body parts that leach onto existing cultural forms through which they function and format over time.

In the next chapter I explore how to develop the mapping of the data producing bodies within the public context of health. I contextualise how technologies have historically been used in relation to the governance of reproductive bodies and discuss how the production of data in and around maternity has to be seen in direct relation to earlier practices of birth technology.

CHAPTER 6



Data is increasingly becoming an important part of contemporary health practices, informing how the health of a body is expressed, cared for and organised. Individuals must produce data in order to receive care, because, practically, it is the entry of data that allows for the care of a person to be processed administratively, as it makes up the bureaucratic resource, which is used for the organisation of care packages, staff, services and so on. More concretely, data often comes from bodies, but how it is used and by whom is increasingly difficult to find out because of data sharing agreements between governmental departments, service providers, commissioners, private insurers, companies, and researchers that allow for anonymised healthcare data to be used for operations outside of care. In this chapter I discuss a series of artistic projects developed in collaboration with artist and maker Bogers in which we explored how to examine what makes up data production within the context of maternity. We were interested in developing an artistic methodology to map the way that reproductive bodies are defined in new ways by data practices and infrastructures in healthcare through taking into account what counts as a body, what falls outside of such definitions and how data captured from reproductive bodies are put to use. This view shows that data technologies extend the body as digital site and allow for that body to be worked upon administratively, furthering the ways that bodies can be governed.[41] Davis-Floyd Robbie and Joseph Dumit also point to how hospital information systems are linked to the use of new digital imaging technologies.

> The fact that the baby's image on the ultrasound screen is often more real to the mother than its movement inside her reflects our cultural fixation on experience one-step-removed on TV and computer screens. The electronic fetal monitor wires the woman into the hospital's

[41] Here I draw on Louise Chambers's understanding of Foucault's genealogy in the podcast "The National Archives - When a Woman Is Not a Woman: How the Ministry of Pensions Constructed Gender in the 1950s," *The National Archives* (The National Archives, 2012), in which the production of transgender identities became possible in the UK in 1950 through the registration of transgender people's preferred gender on their national insurance card. This is due to a number of practical, technical, financial and cultural circumstance. Here, the practical processes of bureaucracy is understood as both enabling and regulating of people's gender identities.

> computer system, bringing birth into the Information Age (Davis-Floyd and Dumit 1998, 1–2).

Birth technologies have often been seen as dismantling, replacing or intruding on the more preferable and natural condition that is lost within technological mediation (Thomas 2013, 195). In second wave feminist and queer theories, biological understandings of sex were rejected in favour of the concept of gender, an invisible but repetitive and disciplinary social process through which norms of the heterosexual matrix are inscribed into bodies (Butler 2008). The concept of "woman" as a culturally constructed places concerns about biological matter in feminist theory because bodies were predominantly seen as a blank surface upon which the cultural was inscribed. The reluctance to deal with the biological body and new technologies was understandable in the light of how concepts of biological sex had been weaponised and used against women's own bodies within medical science and practice. The introduction of the forceps paved the way for the medicalisation of birth in the 1800s, establishing a new hierarchy of scientific knowledge around reproductive bodies where male doctors figured above earlier women-led practices of midwifery (Wilson 1995). This led to a care culture in which male doctors had sovereignty over birthing women's bodies, which, today, is still reflected in the way that birth technologies often operate in extension of the doctor's scientific view. Imaging technologies, such as the ultrasound, literally remove the mother from the picture and give medical professionals access to an external view of the womb, which often takes precedent over the pregnant person's experience. Similarly, the use of centralised monitoring rooms for foetal heartrate sensors at maternity wards allows for new spatial routines between pregnant individuals and their carers because the distribution of the heartrate monitor data allows healthcare practitioners to look into the wombs of women while sitting in an office separate to the birth suite. When Robbie and Dumit focus on the cultural fixation screen image as "more real" than the pregnant person's embodied experience, they conceptualise the relationship between bodies and technologies as fixed:

the active technology working on the surface of the passive body. Thereby, they miss an important point about how birth technologies themselves are a part of how a pregnant person experiences their own body and, importantly, how that body is governed. I therefore focus on how new technologies are co-constructing of bodies and part of the reorganisation of structures of power and decision-making hierarchies around the reproductive body. Katie Lloyd Thomas suggests that we consider body-machine relations as processes rather than distinguishable entities in her analysis of the baby born in the NICU as a living socio-technical assemblage. She argues that birth technologies must be understood as part of the production of life, especially for the premature baby, where there is most likely no prior *natural* living state.[42] In the following series of experiments, I explore how to give an account of data as a birth technology that co-produces bodies and carries the potential to both be oppressive and enabling in the way they are developed and used. [43]

I approach this task through my practice by focusing on mapping how a body is defined within the socio-technical systems of healthcare delivery that operates through maternity databases, costing systems and care administration processes. While these processes and systems are mostly imperceptible to people receiving care, they influence what is seen as a reproductive body and how it should be cared for. First, I explore the social situation of data entry as it is negotiated between the midwife and the expecting family in the graphic fiction *Welcome to The Maternity Ward*. Secondly, I discuss the sketch series *Allocation of Reproductive Responsibilities*, where I explore what gender

[42] Lloyd draws on the French philosophers Gilbert Simondon's conception of the *technical object* : "[..] A stable mixture of the human and the natural, it contains the human and the natural; it gives to its human content a structure similar to natural objects," (Simondon in Thomas 2013, 194–95).

[43] I use the term *pregnant people* to describe cis women, transgender and non-binary individuals who are expecting a baby. I use the category of woman, which specifically refers to *gender,* to denote the social responsibilities, roles and behaviours that are usually attached to and expected to be performed by people with the female sex. I might also use *woman* to describe a specific circumstance, historical referencing or to paraphrase how people's bodies are generally determined as female within the discourses of maternity and the further literature.

prerequisites are latent in healthcare database for being pregnant, being able to produce pregnancy data and accessing reproductive care. In the third experiment, I examine the in- and exclusion of data in the printed cloth series *Top Ten,* exploring the top ten most used words in maternity policies countered by the ten most important words as described by individuals. Finally, I discuss the project *The National Catalogue of Savings Opportunities: Maternity (London),* a spoof savings catalogue designed for the maternity ward in which women can look up what part of their body is the most cost saving to the NHS. This project more explicitly comments on the range of *intelligent products* launched by NHS RightCare, such as visualisation tools, cost-orientation tools, cost optimisation reports and predictions (RightCare 2017; NHS Digital 2015; n.d.) that are created using service users' data (Cripps 2017). In the project, with Bogers, we explore how artistic practice can become an investigation of who benefits from such products by using the idea of an artwork to connect families with how their data is used.

Artistic Material: Maternity Data

Data driven governance is a fast-developing field in healthcare where bodies are increasingly being positioned as sites of financial and political interest through the production of data. Healthcare data is collected and used for a range of clinical and administrative purposes, including local assessments and evaluations of services for regional and national performance assessments within or across healthcare systems as well as for epidemiological studies of diseases (Martin 2008). However, the financial prospects of public healthcare data is also of acute interest to the growing industries around e-health, smart health and precision medicine (WEF and McKinsey 2013). In 2014 the Health and

Social Care Information Centre (HSCIC),[44] now the NHS Digital, formed the project *care.data*[45] which worked on integrating a range of anonymised patient data from doctor clinics and other social and clinical care sites in the UK with the purpose to mine them for non-care related secondary purposes. The department also offered commercial services such as *data linkage* and *extraction*[46] to researchers, pharmaceuticals and health care insurers (Wolf 2014; Ramesh 2014). The project came to an end in 2016, but was followed up with new programmes such as the RightCare's *intelligent range of products* which I explore in the research.[47]

While the use of patient data to accumulate financial value in the public health system puts the value of data as well as acts of data production in a new light, the data infrastructures of today's healthcare are shaped by older categorisation practices such as population management. Michelle Murphy argues that population management as a practice should be understood necropolitically as the way that life itself is economised (Murphy 2013). Often used as a neutral term for groups of people, the concept of population is however assembled through the specific theoretical and laboratory scientific practices of the 18th century (Murphy 2013, 144). The scientist Raymond Pearl was working amongst a scientific community engaged with racial engineering of hereditary lines and the production of a fitter human race when he worked on the concept of population. He concluded a drosophila

[44] The HSCIC provided the BT/MedRed MBHC-partnership with anonymised patient data for a cross-Atlantic cloud partnership, providing commercial access to aggregated population data for more than fifty million lives. MedRed will develop this data using big data tools and AI and, in turn, charge for pharmaceuticals and research institutions to access it. MedRed, hardly a neutral company, was in 2007 contracted by the US army to research on blast impact and chemical and biological weapons and developed a software to track brain injuries and PTSD of military personnel and veterans. Interestingly enough, there was no media coverage of the partnership following its launch in 2014.

[45] The NHS have since 1989 collected Hospital Episode Statistics (HES) to check the safety of hospitals and the quality of services in the different areas of the country. The care.data was an attempt integrate data from outside of hospitals, such as GP data, to centralise all the different forms of healthcare data currently being produced across care delivery sites.

[46] The NHS argues that the fee is a "cost recovery fee" of £1,594 set-up and £2,782 for processing, rather than a profit generated for the dataset itself.

[47] The recent news of the NHS-Amazon partnership introduces more specific questions in regards to motions of privatisation through data, as Amazon is to be contracted to provide "expert health advice" from the Alexa voice agent. The Department of Health (DoH) claims this will reduce demand on the NHS (Lockley 2019).

experiment, in which he enclosed a number of fruit flies into glass bottles and documented the group of flies as it changed over time, with the argument that populations were predetermined by their environment. They acted as a *living organism,* as it were. He derived the s-curve from plotting the changes over time into a graph (today known as the growth curve), suggesting that what is measured is not population on its own but the population within the specific environment of the bottle (the bottle being the economy). Murphy goes on to argue that "fertility was a pivotal focus of economisation, turning sex and reproduction into an experimental milieu for the development of technical infrastructure for governing life and speculating on human value" (2013, 144). Population as a central concept in healthcare governance is used to structure the collection of data in the way that individuals are profiled as a part of different population groups based on their identity data. As argued by Murphy, such concepts cannot be taken as a neutral organising principle, and they have to be seen in direct relation to the contemporary practice of healthcare governance that regulates the production of care using population data. With increasing uncertainty of public healthcare services and a rising number of care contracts tendered to private providers, it is highly relevant to consider how such concepts are actively at play in the development of the healthcare system.

The specific materials used in the project are the maternity record, which is the infrastructure deciding the types of maternity data required for entry in the healthcare database; the national NHS policy documents such as *Nursing, midwifery and care staff framework* (2016), which includes a clear agenda for nurses and midwives, producing evidence of their working routines (NHS England 2016); *Better Births,* which is a national review of maternity services and care models published by the NHS England; and finally, the centre of the work, the cost-optimisation reports produced by NHS RightCare, which is a publicly funded department developing *intelligent tools* for data driven healthcare governance. The commissioning tool called *Where To Look* (RightCare 2017) developed

by RightCare for Clinical Commissioning Groups (CCGs) is a regularly issued report that includes "cost optimisation suggestions" that directly price "expensive behaviours," certain bodies and body parts.

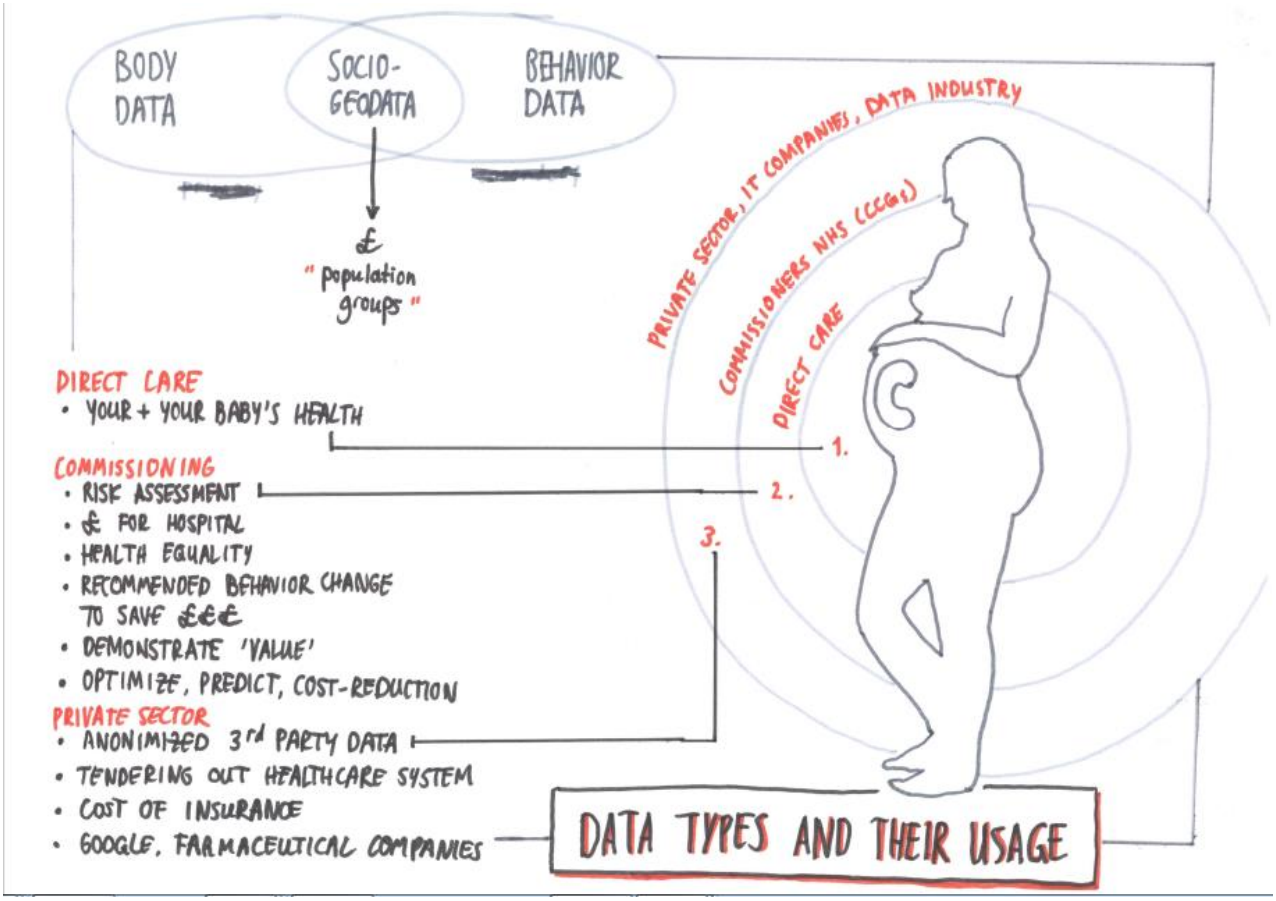


Figure 13. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *Maternity Data Map*, 2017, pen on paper.

Experiment: Mapping Data Entry

The process of registering a person in the maternity database takes place in the first meeting with the midwife, also known as the booking appointment. In this meeting up to 134 questions must be answered as an act of providing data for the maternal record. The data required ranges from medically relevant data, such as weight, blood pressure and mental health history to other forms of data such as migration status, home ownership, income details and marital status, which points to how maternity data expands beyond clinical interests. By creating the graphic fiction with Bogers, who designed the graphics of the story, I was able to explore the context of my own experience of being neonatally data producing by basing the story loosely on this experience. *Welcome to the Maternity Ward* shows that data is a process that moves from bodies, between bodies and databases and between the larger networks within which this data is worked on. Some of the data is of course clinically relevant to the body receiving care because it gives the practitioner an insight into the health history of a person and allows for certain services to be offered, such as translation services for non-English speaking families, support for women with gestational diabetes, a smoking clinic for women who smoke, etc.

Figure 14. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *Welcome to the Maternity Ward,* 2017, digital graphic fiction.

Working with Bogers to give the narration a visual form based on the maternal record shows how a large part of the data is in movement away from the body. The data makes its way through the systems designed to pay bills, commission services, plan care-provision, produce staff rotas, inform migration control and alert social services and becomes useful somewhere else to someone else other than the individual. Often, however, such ecologies are not visible to the individual in the moment of being data producing, and instead, they might be alerted later to the use of their data when they receive a letter from the home office, a hospital bill or see the next year that funding has been cut from their local maternity services. For the individual, the increasing demand for data is difficult to navigate emotionally in the midwife meeting because most care provision is structured hierarchically. If you do not have a test, you could put your baby at risk; if the baby is not monitored, you could put the baby at risk; if your migration data is not provided, the right care cannot be assigned; if a urine test is not provided, early risk signs cannot be spotted, and so on. The technical requirements of the systems are levelled through the midwife's body as the demand for data entry is increasingly becoming a part of clinical and social care practices.

These findings oriented my attention towards how data practices are not distinctly *human* nor exclusively technical, as the midwife has to negotiate her care practice with the infrastructures and systems that allow for care to materialise (commissioning, billing, purchase, salaries, evidence, recommissioning). The context of healthcare data, it is shown, are filled with complex practical, bodily and social practices through which data is produced, supplied, entered and managed in accordance with the technical infrastructures that allow for reproductive bodies to be cared for and governed.

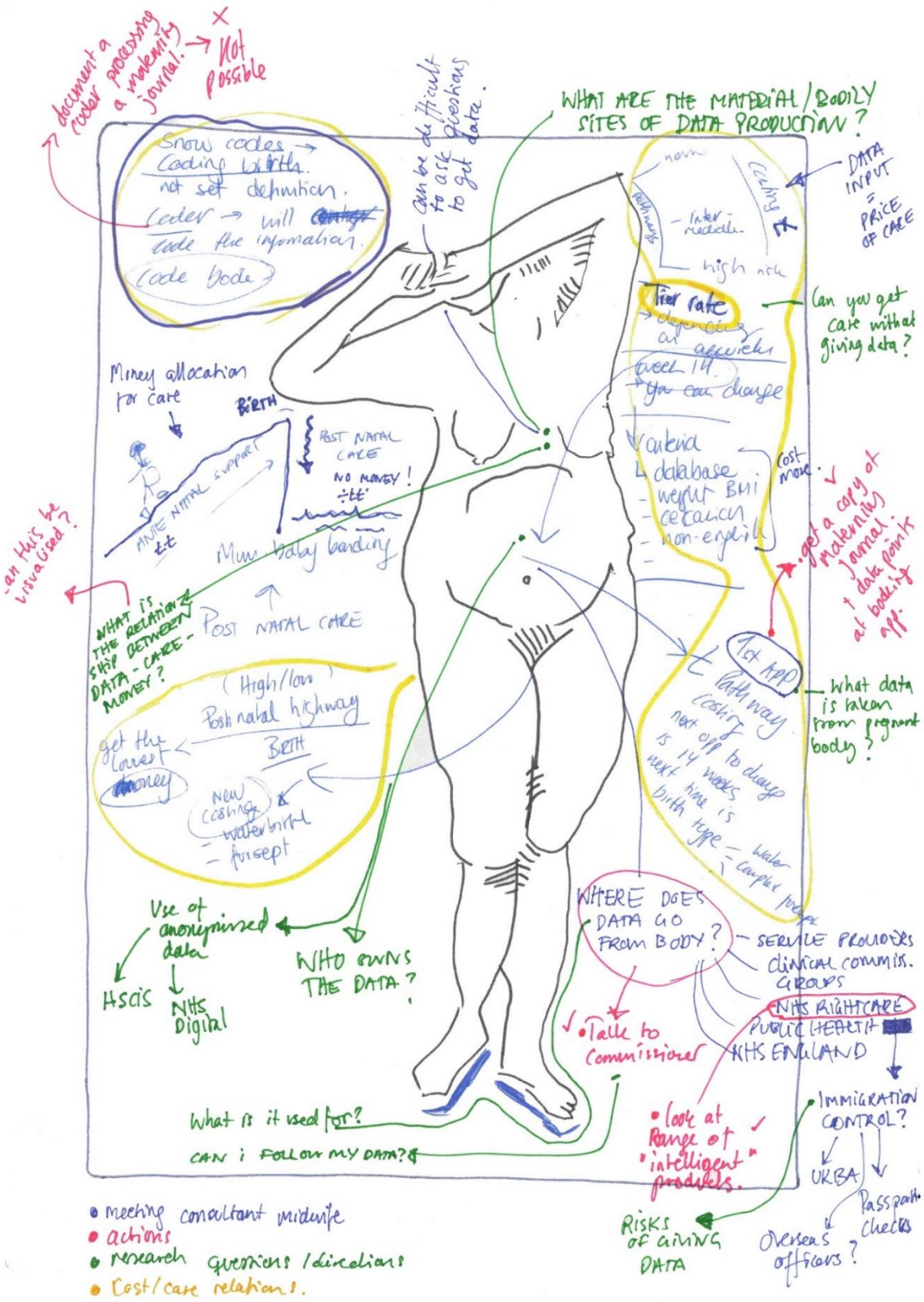


Figure 15. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *Research Map* (conversation with consultant midwife), 2017, pen on paper.

Experiment: Mapping Infrastructures

The experiment *Allocation of Reproductive Responsibilities* maps the infrastructures of reproductive data. The maternal record is the 134-point recipe for what data can be recorded in the healthcare database about a pregnant person. The sketch explores what is the relationship between bodies and the data they produce, more importantly, it addresses whose bodies can produce the required data. The sketch is created by dotting the data points of the maternal record onto the outline of the bodies of different expecting families. The data points are dotted onto the bodies approximately in the region that the data is extracted from, baby data on the belly, vaginal thrush numbers on lower abdomen and mental health data on the gut. The more exterior data points, such as address, migration status, employment status and marital status, are placed randomly around the body.

As an experiment, the drawings show what bodies data is expected to come from, and in turn, it makes visible whose bodies can produce such data. Only a female with a baby in the belly can be processed within the database,[48] practically erasing fathers and same sex families administratively and clinically speaking. The social expectations of gender, of *mothering,* are brought alive in the moments of data entry but also on a higher-level, as gender norms come to structure how reproductive health is conceptualised. As the title of the sketch suggest, one might think about the database as an organising mechanism for care responsibilities in which data becomes a building block, allowing us to consider how binary concepts of gender structures how care is conceptualised, commissioned and delivered.

[48] One of the reasons for this is how maternity care is conceptualised through medical care for a biological female. While some of the items in the database do refer to gestational clinical concerns, a lot of the data points are outside the scope of clinical care. I will later discuss why it is important to consider this gendered aspect of reproduction as the data is recycled in the making of intelligent products.

Figure 16. Alexandra Jönsson, *Allocation of Reproductive Responsibilities* (maternal database record), ink on paper, 2017.

Experiment: Mapping the Outsides of Data

The experiment *Top Ten* takes the policy *Leading Change: Adding Value a Framework for Nursing, Midwifery and Care Staff* (NHS England 2016a) and the commissioning reports for maternity, *Commissioning for Value: Introduction to Where To Look* (Public Health England 2017), as a starting point to examine the language used to describe the organisation of maternity care in healthcare governance. [49] The experiment was developed for a public workshop *Nappy Printing & Healthcare Cutting* created in collaboration with Bogers, a workshop in using DIY vegetable printing techniques to explore the content of maternity policies. In the workshop we invited participants to engage maternity policies by potato printing the wordlists onto nappies, working through the most and least used words letter by letter. The workshop was prepared by creating a little dataset from words used in the nursing and midwifery framework and the *Commissioning for Value* report and by running them through a word count program to create a list of the most used words in the polices. While we expected words such as woman, support and care, the most used words were patient, spend, admissions and value. The creative process of picking out the words from their context one by one, and then examining them letter by letter using colours and large fonts, created a strong presence of the managerial words used to describe the priorities in reproductive health. But it equally created a presence of something missing, namely the absence of words we expected to appear in this context.

Why were words such as partner, trauma, family, body and mental health not present in the policies? One might argue that they were outside of the language of healthcare governance, and therefore,

[49] This experiment is created in collaboration with Bogers. We researched, experimented, and created the visual methodology for researching maternity polices together in a mini residency preparing for the public event *Nappy Printing & Healthcare Cutting* (2016) that we hosted together at the Common House in London. Later, I developed the *counter wordlists* from individuals, comprising a new work that merges the policy view with the view of individuals.

also outside of our data. D'Ignazio argues that feminist data practices must address the *outsides* of data (2015), the missing data and the bodies not counted because, as reinforced by Johanne Boehnert, the production of data is not neutral, and it often mimics hierarchies of powers and the interests of the institutions within which they are created (2016). To explore how to include counter perspectives to the words that occurred the most in the policies, I asked five members of the Lewisham-based organisation Maternity Voices Partnership (MVP) to answer a question: What are the ten most important words to describe health in maternity? Because the MVP as an organisation works to raise awareness of the concerns and experience of communities that are often not represented within policy making and existing care practices, I found that they were an appropriate group to consult for input for the missing words.[50] I printed the words donated by a midwife, a midwife manager, a healthcare activist, a mother and a dad along with the ten most used words in the policy document onto cloth nappies as a continuing text, starting from the top ten most used words in the maternity policy, followed by the personal lists, cloth by cloth. I colour coded the words in a sequence of five colours, each letter becoming re-coloured in the next word, or coloured for the first time, providing a visual journey of how meaning travels across different practices, from data into polices, from polices into care commissions, from services into midwife practices and from care spaces to service users.

[50] Members of Maternity Voices Partnership (MVP) contributed words to this project by sending me their wordlists, and the final work, in a way, represents the value of the MVP which brings together a diverse set of voices in maternity and work to make maternity safer for all families receiving care. The printed wordlists from the individual voices show that there is also a radically different perspective on care compared to the policy documents.

Figure 17. Alexandra Jönsson (The Body Recovery Unit), *Top Ten*, printing process, potato print, 2018.

Figure 18. Alexandra Jönsson, *Top Ten, printed cloth,* 2020. in: Body Politics of Data, solo show, London Gallery West, 2020. Photo: Jalaikon.

The contrast between the language in the maternity policies and the individual people's choice of words presents a gap that can be experienced in the way I exhibited the cloths hanging one next to another without any indication of their sources.[51]

While data is not the only way that healthcare concerns are evidenced, it is a central part of how care is unlocked, practically speaking. Healthcare inequalities such as "unwarranted variation," where care outcomes differ from area to area or between population groups, are often understood by care practitioners before they are evidenced in data.

> The process may start with a conversation with a colleague. We often benchmark ourselves against colleagues, informally, without even realising it. […] Improving outcomes requires us to reflect on our practice. It is not easy, and we often need support to the make the necessary change. Now we need to measure it, too, to demonstrate as nursing, midwifery and care staff the value that we bring (NHS England 2016).

People in maternity constantly work to make care more inclusive and are supported to do so by organisations such as the Lewisham MVP, who brings together community-led projects that focus on specific needs, such as the experiences of parents of children with Downs Syndrome, BAME women's health and LGBTQ families.[52] But these needs most of the time need evidencing in data before they can circulate among the governance bodies and appear in the maternity database for midwives to use while they are giving care. This became an undeniable fact when the MBRACE report (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries) (Knight et al. 2018) came out in 2018, confirming in numbers what many healthcare professionals had known for years: BAME

[51] The artwork was following the solo exhibition *The Body Politics of Data* (2020), given to the MVP to display in the maternity ward.

[52] These has specifically been the focus of the work of Lewisham MVP, in the past couple of years, with both activists, care staff and service users coming together to put focus on how care can become better for all members of the community. (*Maternity Voice*, 2019)

women are dying in childbirth, with Black women are five times more likely to die from pregnancy-related complications during childbirth and neonatally (Knight et al. 2018). Such research shows that this knowledge can exist in the community for years without making its ways into data and thereafter into policies and funding circuits. Data, therefore, cannot necessarily be trusted unless the context, processes and decisions by which it is made are available to be examined. This equally raises questions for the use of publicly available data in artistic practice, where there is a trend to centre on the visualisation of data rather than examining the structures or classification principles through which data is produced. This shows that visibility is a problematic concept for understanding data because what/who is inside of data is culturally, technically and contextually dependant. From an artistic perspective, this is interesting because a focus on art and technology, on visualising or physicalising existing datasets in order to allow audiences to grasp how computational technologies can mediate the world, does not allow us to examine the sometimes flawed and discriminatory ways that new technologies organise the environments they operate within. The research thus uncovers a context to data that artistic practices could beneficially engage with and, as a result, develop a critical vocabulary for art and technology practices to respond to the contextual and lived experiences of data. In the next project, we explore more directly how the output of our experiments can be presented as a work of art that intervenes into the daily context of healthcare by connecting people with the way that their data is used.

Project: The National Catalogue of Savings Opportunities

The project *The National Catalogue of Savings Opportunities. Maternity, Volume 1: London* (2017) is an investigative artwork created in collaboration with Bogers that examines new data driven healthcare models such as RightCare's *Commissioning for Value* programme introduced in 2016 in the UK. The project was informed by the earlier experiments in mapping the context of maternity data, but here, we more directly explore the question: what data is produced in a maternity ward, such as breastfeeding data, actually used for?

The final project, *The National Catalogue of Savings Opportunities,* emerged from a longer process of researching the range of RightCare "intelligent products"[53] before deciding to focus on the cost optimisation tool *Where To Look* (RightCare 2017). The report is a digital product created from using a range of datasets, including data extracted from women's lives, bodies and behaviours throughout healthcare services, which we also discuss in our article *Data-Driven Visibility: Maternal Bodies* (Jønsson and Bogers 2018). Digital initiatives are often marketed in neutral and utilitarian terms, however, the rise of intersectional feminist concerns within the maternity sector show that claims on data driven governance providing "real value to patients," have to be challenged.[54] Therefore, we explored how to bridge the gap between people and their data by making artistic output that connects expecting families with how their data is used.

The National Catalogue of Savings Opportunities is created to explore how predictive tools such as *the Where to Look* reports frame the body as a site of cost-optimisation. The artwork is a 106-page miniature pocketbook that shows where the cost optimisation algorithm works with the body

[53] It can be downloaded from NHS RightCare's website.

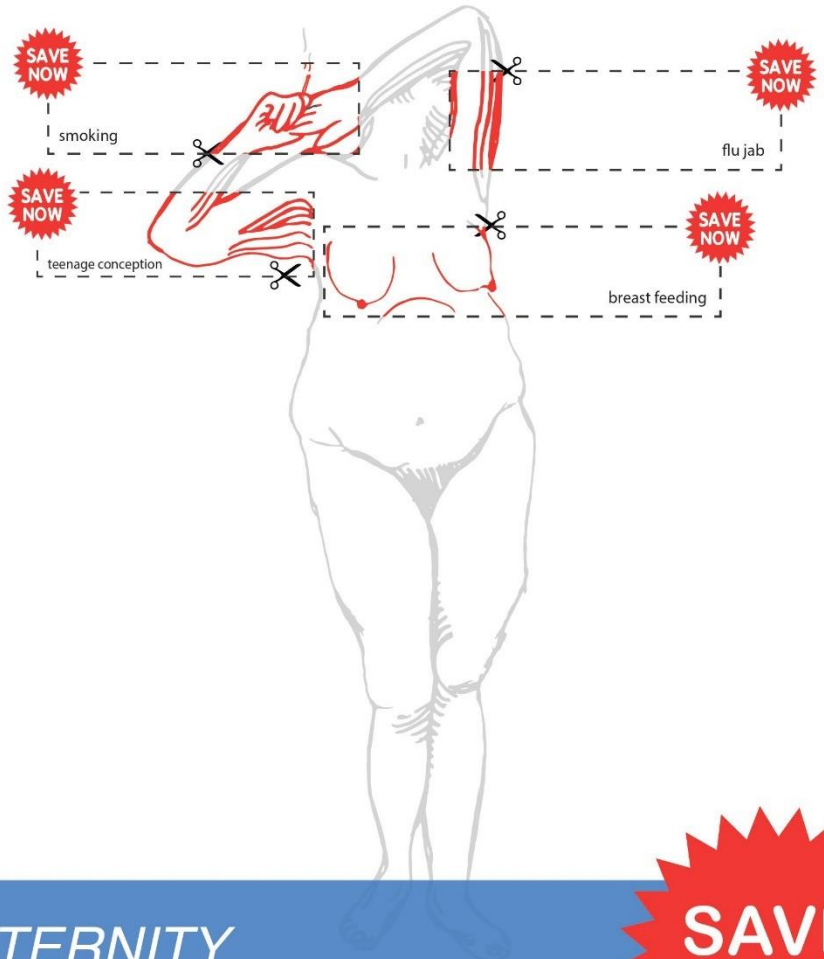
[54] The RightCare programme is a three-step model to instigate change in healthcare governance; 1) Where to Look, 2) What to Change, 3) How to Change. Phase one, the 'diagnosis' of where hospitals can spend less money, is heavily reliant on quantifying bodies and behaviours of the population in order to optimise spending patterns and the quality of care (NHS England 2016b)

depending on geographical location. The booklet is designed for antenatal waiting rooms across London's hospitals, as a little catalogue serving back body data to its very creators. It invites pregnant people to see which parts of their body have the most cost-saving potential for the government, which is how the data is framed in the NHS RightCare reports, showing them that they could personally save the NHS an arm or a leg, by "simply" choosing to breastfeed, lose some weight, get a flue jab or stop smoking. The *Where To Look* report is a commissioning tool periodically issued to regional CCGs that manage healthcare commissioning for clusters of local hospitals and care providers, and it encourages commissioners to align spending priorities with the RightCare predictions (Jønsson and Bogers 2018). The reports are grouped in "similar CCGs," that is, population groups that have similar data profiles and demographic compositions, which in the maternity section take into account indicators such as race, breastfeeding initiation, smoking at the time of delivery, flu vaccines and age of conception. These indicators equally appear in the *Where to Look* reports that are issued to individual CCGs, specifying how much money the listed "improvement opportunities" could garner in the thousands of pounds.[55]

[55] It is stated that the metrics produced in the RightCare programme are also created to reduce care inequalities and measure the performance of hospital services. In the making of the savings catalogue, we decided to focus on the "costing" of body parts and behaviours associated with pregnant women. This is currently important to grasp the implications of such applications of metrics because the healthcare system is undergoing restructuring in which cuts play a central role. It is important to find out if "cost-optimisations" are synonymous with cuts, and if the responsibilities are redirected to individuals as a part of putting the women's body at the centre of maternity data. While the metrics produced in the RightCare programme are also aimed at identifying problems and opportunities for higher quality of care and eliminate care variations within the healthcare services, we have chosen to focus on connecting the predicted costs and values to the bodies that are expected to make such savings.

THE NATIONAL CATALOGUE OF SAVINGS OPPORTUNITIES

by the Body Recovery Unit



MATERNITY

SAVE £££s

Volume 1: London

January 2016

INTRODUCTION

The Metrics of Care

The National Catalogue of Savings Opportunities is a visual experiment investigating the cool cash of care. By digging through healthcare databases, it draws out the parts and behaviours of the maternal body with the greatest 'cost-saving potential'. Using freshly sourced statistics from the savings and quality improvement 'Where to Look Packs' supplied to all Clinical Commissioning Groups (CCG) throughout the UK, the catalogue visually indexes the maternal body according its savings potential. Simply look up your body in the National Catalogue of Savings Opportunities and make your cuts: it might just save you an arm and a leg!

ABOUT

The Body Recovery Unit

The BRU is artistic research unit established in 2017 by Loes Bogers & Alexandra Jonsson exploring methods to scavenge for body parts in digital waste materials, public records and database and look at their financial, social and political worth. We are currently digging in into the statistical backbone of maternity services of today, exploring the metrics for care, costing and savings pathways and their predictions.

Want to collaborate? Get in touch, we are always prepared for new adventures!

Bogers & Jonsson
bodyrecoveryunit@gmail.com

CONTENTS

In order of savings in £:

Save up to £20K now!

WHERE TO CUT: **BARKING & DAGENHAM**

Demographics such as: deprivation score, age, % of people registered with a GP, population density, % belonging to 'ethnic groups' and more, seem to mean that *Barking & Dagenham's* relative success can be assessed by comparing it to:

Greenwich
Waltham Forest
Enfield
Luton
Croydon
Haringey
Slough
North Manchester
Birmingham South & Central
Sandwell & West Birmingham

Improvement and saving opportunities

NHS Barking and Dagenham CCG

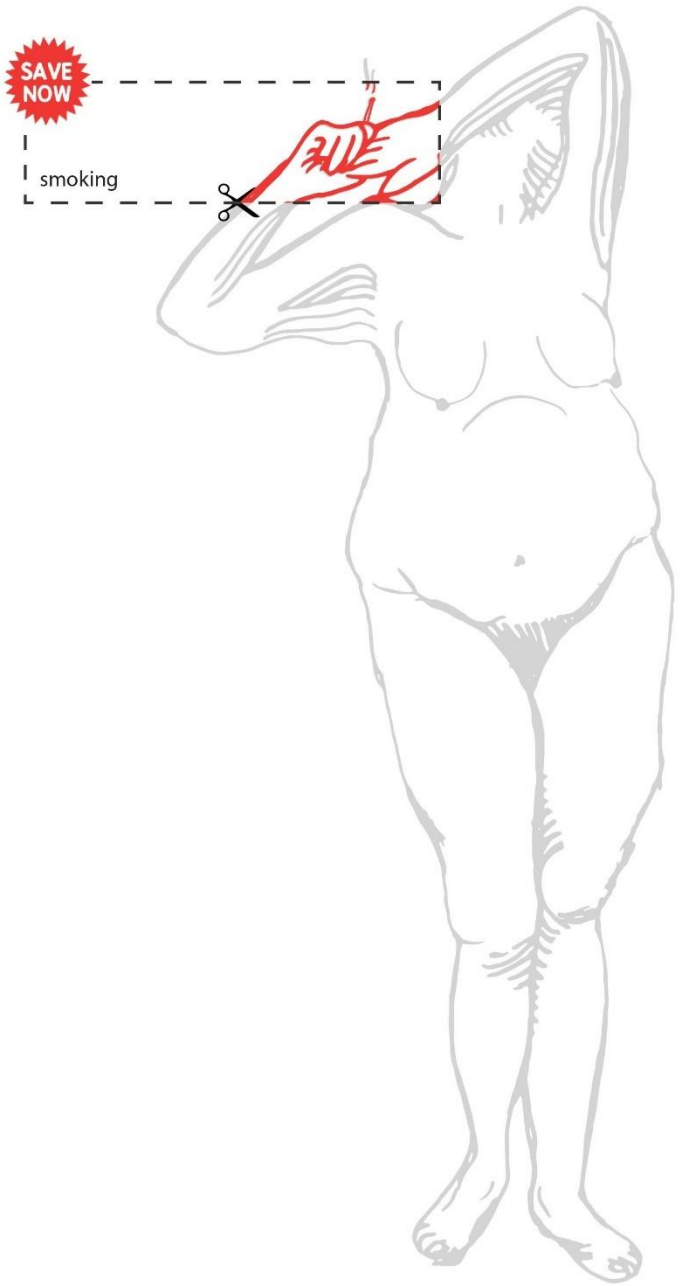
This table presents opportunities for quality improvement and financial savings for a range of programme areas. These are based on comparing NHS Barking and Dagenham CCG to the best 5 amongst a peer group of 10.

Disease Area	Spend	£000	Quality	No. of patients, life-years, referrals, etc.
Maternity & Reproductive Health	• Spend on primary prescribing	20	• Teenage conceptions	48
			• Smoking at time of delivery	148
			• Breastfeeding initiation (first 48 hrs)	214
			• Breastfeeding at age 6-8 weeks	406
			• % receiving 3 doses of 5-in-1 vaccine by age 2	173
			• % of children aged 4-5 who are overweight or obese	129
			• % receiving 2 doses of MMR vaccine by age 5	157
			• Mean number of decayed, filled or missing teeth in children aged 5yrs	90

WHERE TO CUT BARKING & DAGENHAM

Step 1: smoking

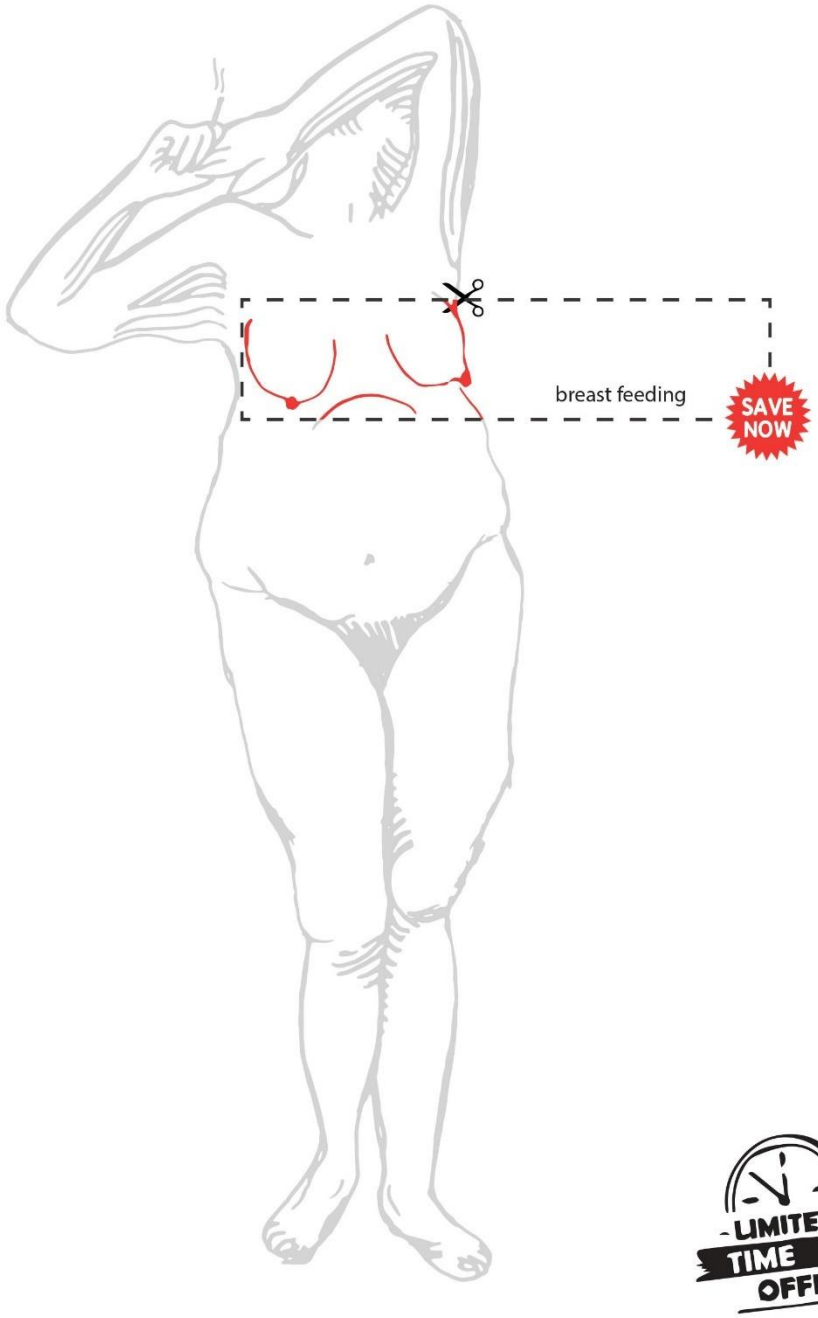
Save up to £20K now!



LIMITED TIME OFFER

WHERE TO CUT BARKING & DAGENHAM

Step 2: breast feeding ***Save up to £20K now!***



Sorry, currently ***no £££s*** *to save in Barnet*

WHERE TO CUT: **BARNET**

Demographics such as: deprivation score, age, % of people registered with a GP, population density, % belonging to 'ethnic groups' and more, seem to mean that *Barnet's* relative success can be assessed by comparing it to:

Sutton
Bexley
Hillingdon
Milton Keynes
Bromley
Kingston
Crawley
Dartford, Gravesham and Swanley
North West Surrey
Swindon

Improvement and saving opportunities

NHS Barnet CCG

This table presents opportunities for quality improvement and financial savings for a range of programme areas. These are based on comparing NHS Barnet CCG to the best 5 amongst a peer group of 10.

Disease Area	Spend	£000	Quality	No. of patients, life-years, referrals, etc.
Maternity & Reproductive Health			• Live and still births <2500 grams	45
			• Flu vaccine take-up by pregnant women	217
			• Breastfeeding at age 6-8 weeks	6
			• % receiving 3 doses of 5-in-1 vaccine by age 2	822
			• % of children aged 4-5 who are overweight or obese	64
			• % receiving 2 doses of MMR vaccine by age 5	976
			• Mean number of decayed, filled or missing teeth in children aged 5yrs	96

WHERE TO CUT BARNET

Sorry, currently no £££s to save in Barnet

WHERE TO CUT:
BEXLEY

Save up to £152K now!

Demographics such as: deprivation score, age, % of people registered with a GP, population density, % belonging to 'ethnic groups' and more, seem to mean that *Bexley's* relative success can be assessed by comparing it to:

Sutton	Dartford, Gravesham & Swanley
Havering	Thurrock
Bromley	Trafford
Crawley	Swindon
Barnet	Basildon & Brentwood

Improvement and saving opportunities

NHS Bexley CCG

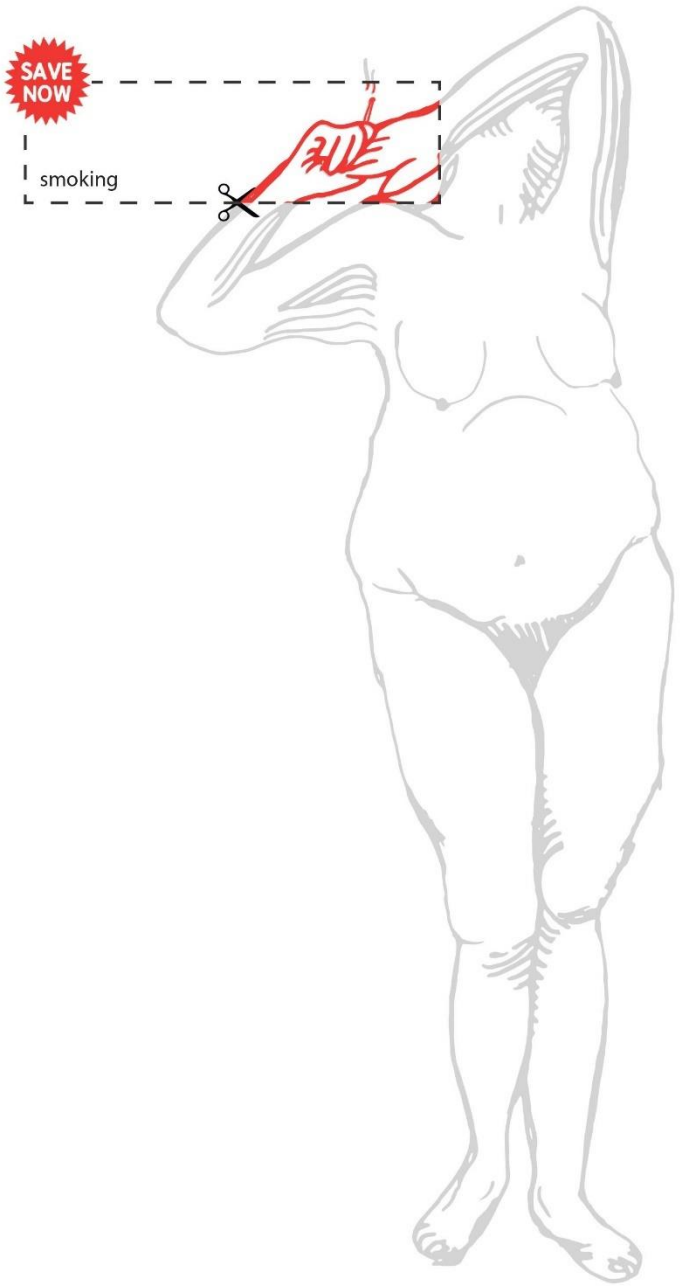
This table presents opportunities for quality improvement and financial savings for a range of programme areas. These are based on comparing NHS Bexley CCG to the best 5 amongst a peer group of 10.

Disease Area	Spend	£000	Quality	No. of patients, life-years, referrals, etc.
Maternity & Reproductive Health	• Spend on primary prescribing	152	• Teenage conceptions	23
			• Flu vaccine take-up by pregnant women	164
			• Smoking at time of delivery	55
			• Breastfeeding initiation (first 48 hrs)	373
			• Breastfeeding at age 6-8 weeks	1,096
			• Emergency gastroenteritis admissions rate for <1s	62
			• Emergency LRTI admissions rate for <1s	26
			• % receiving 3 doses of 5-in-1 vaccine by age 2	115
			• Unintentional & deliberate injury admissions for <5s	33
			• % of children aged 4-5 who are overweight or obese	191
			• % receiving 2 doses of MMR vaccine by age 5	153

WHERE TO CUT BEXLEY

Step 1: smoking

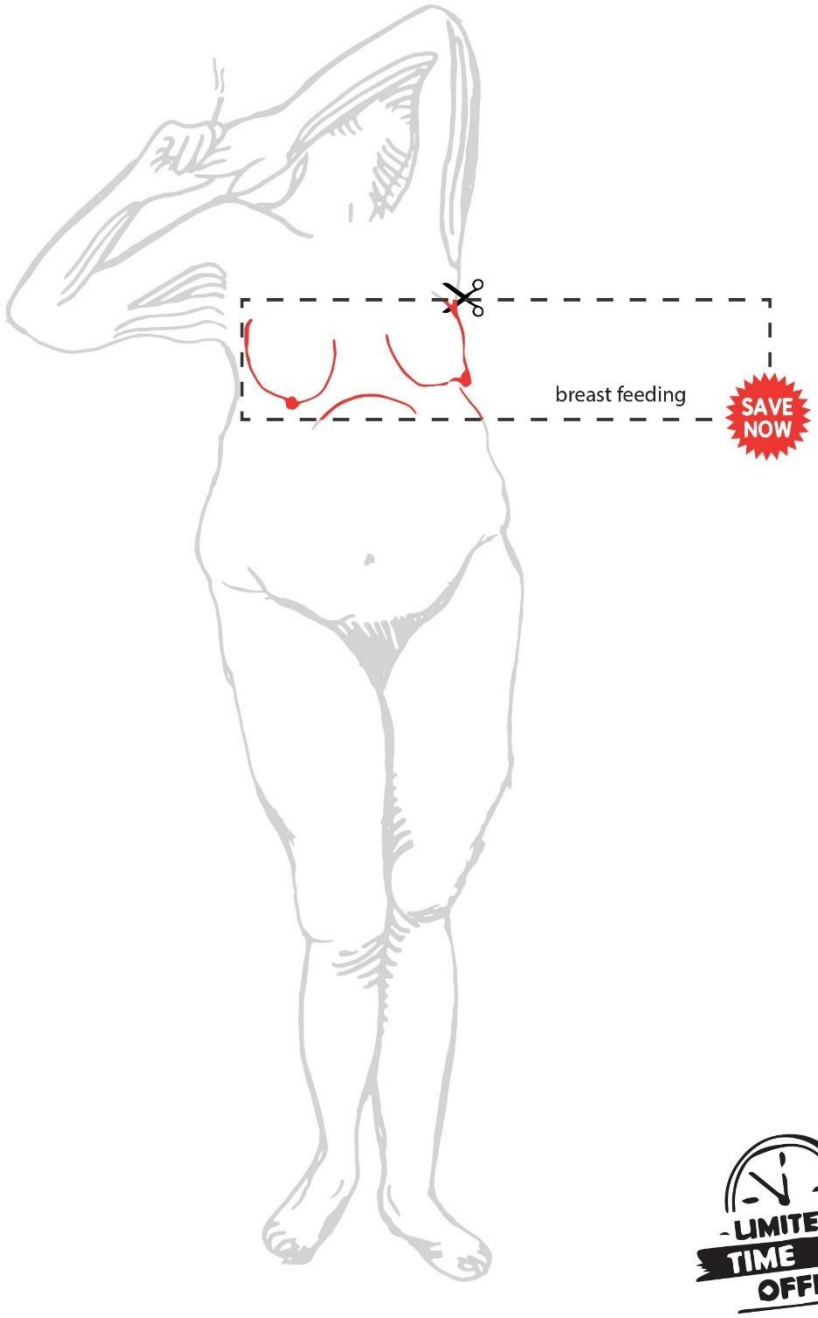
Save up to £152K now!



LIMITED TIME OFFER

WHERE TO CUT BEXLEY

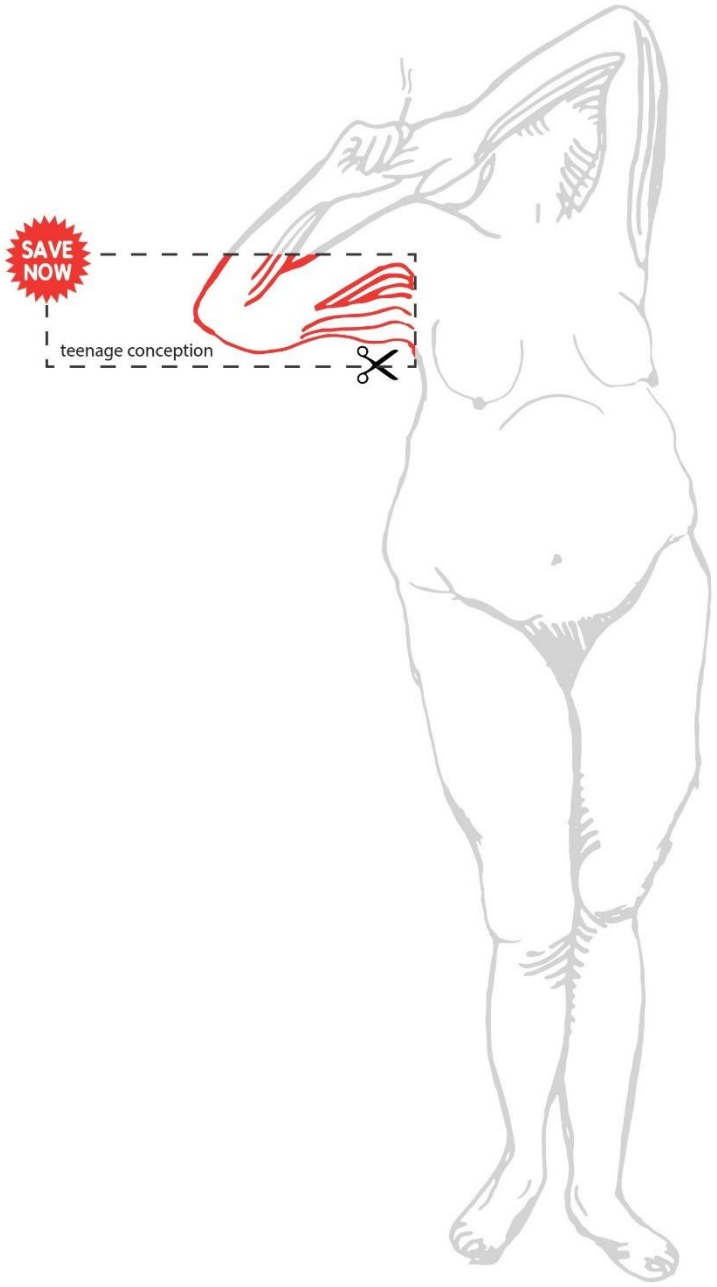
Step 2: breast feeding ***Save up to £152K now!***



WHERE TO CUT BEXLEY

Step 3: teenage conception

Save up to £152K now!



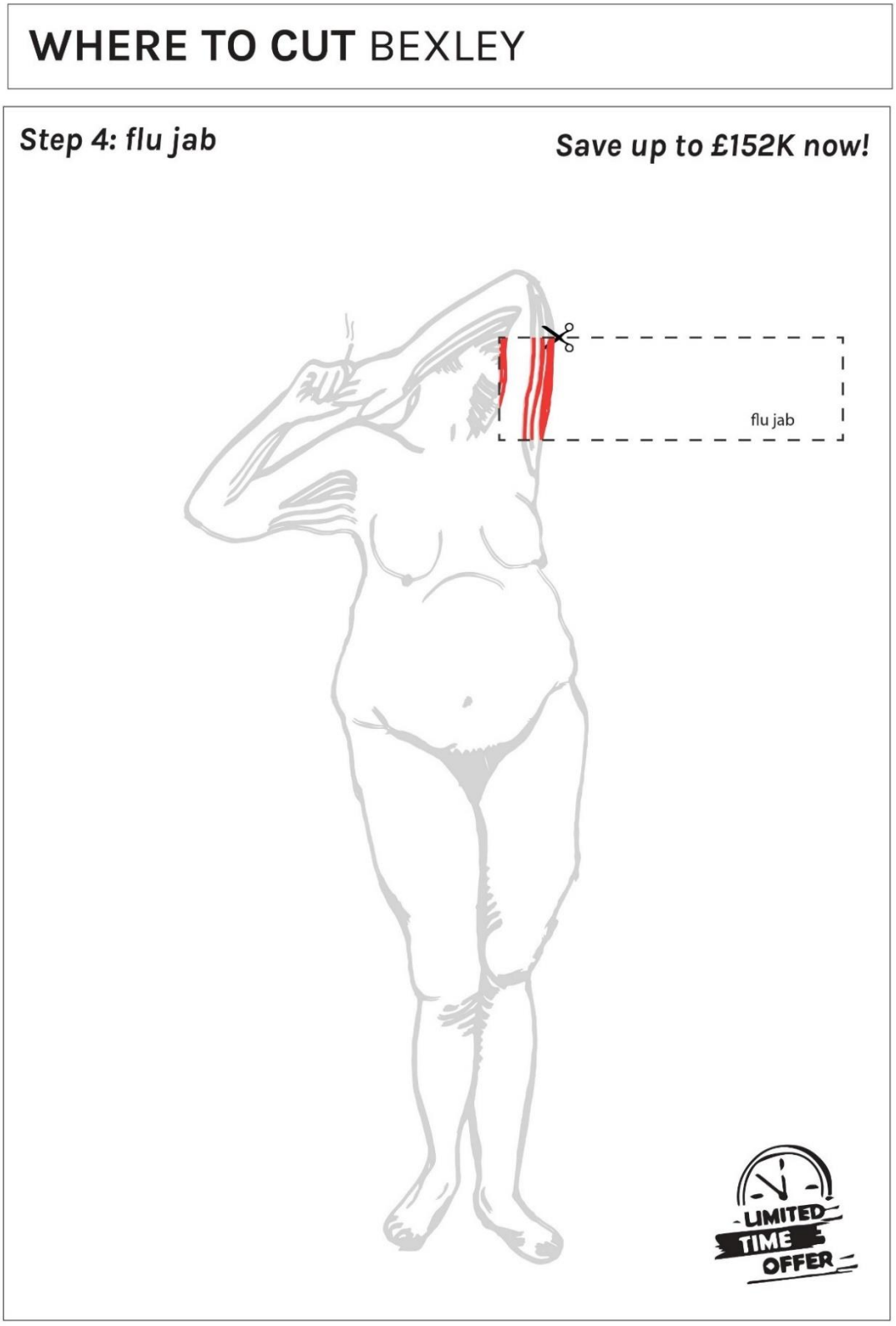


Figure 19. *Alexandra Jönsson and Loes Bogers (The Body Recovery Unit),* The National Catalogue of Savings Opportunities. Maternity, Volume 1: London *(excerpt from book), 2017, digital book.*

How Fat Comes to Count

By mapping how the *Where to Look* tool operates on a body, how bodies are defined by the data it gives away becomes apparent. In the catalogue, the cost-saving areas of the body are marked with a red dotted line that moves, as you flick through the different areas of London in the catalogue, because the cost optimisation prediction changes based on location. The improvement opportunities vary enormously across London, ranging from £0 in West London to £380,000 in Wandsworth. This means that bodies in poorer areas are more visible in the database because they have more pregnant people that are also overweight, teenagers, smokers and non-breastfeeders, which become indicators of high healthcare costs. The highest cost savings are therefore also to be made in poorer areas. While pricing healthcare in itself is not necessarily wrong, the way that the data is used becomes problematic when behaviours of population groups are targeted instead of the conditions they are living under. In practice, this means that you will only ever be targeted for being fat if you live in a certain postcode, while you might be happily overweight and pregnant without encountering fat loss programmes in others. The report can be seen as a tool to target certain body parts and behaviours as proxies for broader health concerns; breastfeeding equals healthy, while smoking and fat equals unhealthy, etc. On top of this, it appears that the cost-optimisation tools equate good health with cheap health (Dropkin 2017), shifting the task of nudging people to "improve" their behaviours in the direction of care professionals, instead of contextualising how complex health inequalities affect families' experiences of pregnancy and childbirth, such as poverty, lack of access to support, lack of childcare for older children, insufficient housing, education, adolescent and transgenerational trauma and gestational violence.

Economisation of Life

By creating the *National Catalogue of Savings Opportunities,* cost optimisation measures are made visible within the context of a body, and how women's bodies are conceptualised as *sites* of financial interest becomes clear. We can understand the RightCare reports through Kitchin's analysis of how data becomes an *economic* resource:

> [...] the production and analysis of data enables companies to be run more intelligently with respect to how they are organised and operate, promoting flexibility and innovation, reducing risks, costs and operational losses, improving customer experience and maximising return on investment and profits. [...] Data can thus be understood as an agent of capital interests (2014, 16).

The RigthCare model, however, has been criticised for not being publicly accountably because how it is made its not openly shared with other public health researchers (Dropkin 2017). This lack of accountability might raise questions if corporate modes of practices creep into public services when it comes to the introduction of data driven governance. While often described outside of the logic of gender, the cost-based focus in direct relation to maternity data raises the question of to what extent the pregnant body is itself becoming a site of computation and thus a site of value enhancement. Murphy argues that the *economisation of life* is

> [..] not only as a historically specific experimental mode of making value, but as a mode which was built through an extensive transnational calculative infrastructure, producing reams and reams of data, circulating enormous flows of funds, distributing millions of commodities in the name of projects to capitalize and modernize dispossession through sexed life in name of the economy. As such, it was the regime of value in which reproduction and social reproduction—and hence implicitly sex, heteronormativity and women—far from being ignored, were at the centre (2013, 153).

This means that the creation of cost optimisation tools in reproductive health, in which certain bodies are more visible than others, is part of the structuring of the population and she continues "[…] it is thus fully within the logic of the economisation of life that intensive family planning projects of 'continuous motivation' were so often accompanied by high rates of infant and maternal death, or other forms of letting die" (2013, 153).

In the making of the *National Catalogue of Savings Opportunities,* it was a priority to create an artistic output that could recirculate in the context of maternity care and reach the families whose data is used in the cost-optimisation tools. By this gesture, we point to public healthcare spaces as the appropriate context to discuss if people's data are being used to repackage the complex societal issues of poverty, institutional racism and dwindling funding of the NHS as individual health problems. Considering the historical context of eugenics from which the concept of population arose, Murphy asks if we should accept processes of de/valuating the individual, because the concept of population pushes the view of lived bodies into the background (Murphy 2013, 142). While data methodologies can potentially be useful to spot care inequalities, there are other and more severe healthcare problems, like the prioritising of initiatives such as NHS RightCare and the development of cost optimisation tools that vilify women's bodies and behaviours. This indicates that the potential of these technologies is not used in the right way. Why, for an instance, are "intelligent tools" not used to spot where, why, and how women are dying in childcare, as suggested by the MBRACE report?

Cost-optimisation Aesthetics

The booklet invites expecting families to look up what part of their body is the most cost saving to the healthcare system.[56] The design of the catalogue, its colours, fonts and size is developed in response to the context of healthcare and policy making. By mimicking the blue-toned graphics and A4 format of healthcare policies, we wanted to reference the aesthetic context in which the cost-optimisation tools are produced. We wanted the booklet both to exist within the daily healthcare context but at the same time create a process within the artwork for critical reflection by countering the formal aesthetics with the visual content and the title of the catalogue. The use of the format of a ”savings catalogue” invites the reader to critically consider the growing commercial interests in healthcare data in relation to their own bodies. Is it the responsibility of individual women to lower public healthcare costs by changing their bodies and behaviours? At the very least, the *National Catalogue of Savings Opportunities* offers the opportunity to look up your postcode, and follow the red lines cutting across the areas of the body which posit the most cost saving potential.

After creating the catalogue, we liaised with both healthcare professionals and an art consultant in the hospital with the aim to produce the catalogue as a waiting room intervention. When we showed the catalogue to consulting midwives, most of them focused on the dotted red line that moves across the woman’s body as a visual “trigger” from the perspective of a midwife because sometimes women’s bodies are literally cut in childbirth. The general opinion was that it was not suitable to exhibit in a maternity ward or a waiting room because the existing arts policy at the hospital did not allow for the way that we decided to frame the relationship between healthcare funding and social

[56] Because this work was developed for the purpose of the research, the research process and design of the conceptual approach took priority over the production of a large-scale intervention to put the catalogue in London’s maternity units. We attempted to exhibit the catalogue in one maternity unit, but the management found the content went against the visual strategy of *art in the hospital* because it was created in a way that made visible the relationship between healthcare funding and social inequality.

inequality to exist within the care space in the way we envisioned. While most of the healthcare professionals acknowledged that the monetary system and the rising data collection in services were important to address, they thought that the project was more suitable to showcase in the social context of training consultant midwives and people who deal with polices.

Figure 20. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *The National Catalogue of Savings Opportunities. Maternity, Volume 1: London (*miniature version), printed copy in: Body Politics of Data, solo show, London Gallery West, 2020. Photo: Jalaikon.

Scaling the Intervention

The scale of the catalogue became a site of reflection for me because of the question: what does size reveal about the matter at hand? When we created the catalogue based on the *Where to Look* reports, it was yet unknown to us how implemented they were practically in the daily context of healthcare commissioning and management. The team behind the NHS RightCare products profile themselves as being at the heart of restructuring the commissioning processes with the use of AI and smart technologies that, according to their director, are "designed to help entire health economies take action to increase value in healthcare provision and to reduce unwarranted variation" (Cripps 2017). The rhetoric of the digital is grandiose and opportunist, but the practical reality appears to show otherwise. Despite the claims that the intelligent tools are at the centre of commissioning and producing "real" value,[57] we could not find a single consultant midwife, manager nor commissioner who knew or used the RightCare products. Maybe the bigness of data, as suggested by Behar (2016a), is tied to a constant state of verging to be junk? Or as pointed out by D'Ignazio and Klein (2020), is the overstatement of the technical capabilities of data tied to a lack of understanding of what kinds of data can be big and the erasure of the *outsides* of data as well as small and missing forms of data? The identification of the gap between how digital products are marketed and how they are experienced, made me consider how to deflate this currency of bigness in the project itself.

[57] Unfortunately, when offered the opportunity to see a presentation of our project and answer questions, the RightCare team declined. So unfortunately, I have fallen short on opportunities to include their position and reasoning in this regard.

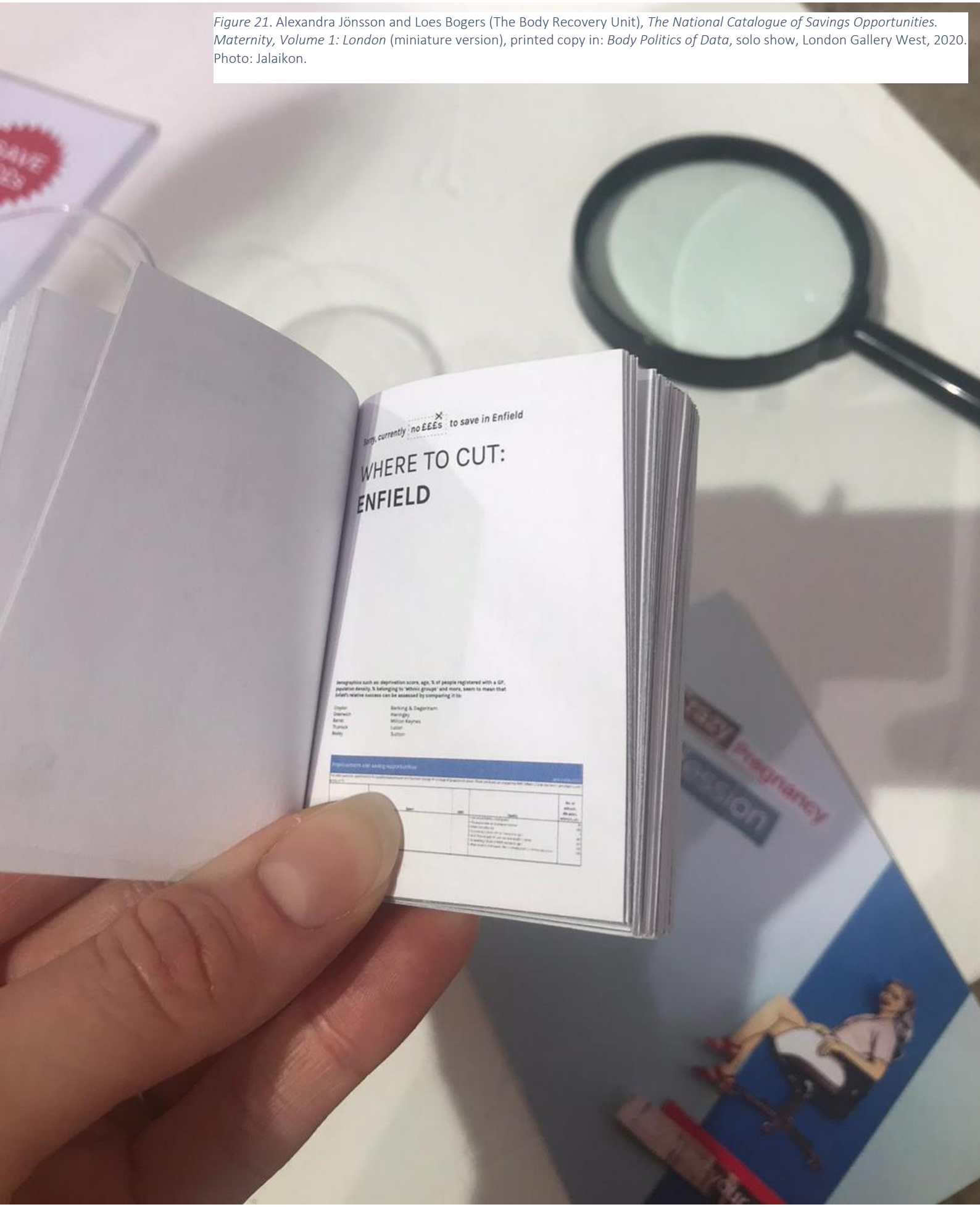


Figure 21. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *The National Catalogue of Savings Opportunities. Maternity, Volume 1: London* (miniature version), printed copy in: *Body Politics of Data*, solo show, London Gallery West, 2020. Photo: Jalaikon.

a comfortable size, the eyes are trained for a smooth 12-point read, and the pages flick easily from one to the next. The choice to resize the A4 catalogue down to miniature version challenges the experience of reading it. The miniature version demands a different interaction from the person looking at it, who has to scrunch their bodies together, bend the head down and fiddle with their fingers to flip through the pages to study the tiny content. The size itself was a way to integrate the knowledge and interactions that I had with healthcare professionals into the work itself, reinforcing a view of data as practiced and experienced through everyday life. Equally, the reading experience of the miniature catalogue is reminiscent of the partially difficult process of making it, which we did by digging into online policies, technical journals and public health strategies, struggling to open, read and manage the different sources of specialised information as a part of an artistic experiment.

Concluding Notes: Reading Data Ecologies Affectively

Haraway points to the "[…] serious danger of romanticizing and/or appropriating the vision of the less powerful while claiming to see from their positions herself"(1988, 584). The knowing position is never neutral. She goes on to argue:

> Positioning is, therefore, the key practice in grounding knowledge organized around the imagery of vision, and much Western scientific and philosophic discourse is organized in this way. Positioning implies responsibility for our enabling practices.(1988, 587)

Haraway's work on visualisation apparatuses and their context enabled me to reflect on my methodology of mapping maternity data and its context as well as its potential for shifting the focus from representation to experience. To begin with, I used mapping as an orientation tool to explore the machines, infrastructure and social norms that underlie the context of data production using line drawing and sketching. In the experiment *Allocation of Reproductive Responsibilities*, I adapt the

position of the maternity record to map the body, and in the *National Catalogue of Savings Opportunities,* it is the view of the "cost optimisation tool" that moves across the outline of the body. Through mapping the usages of data, it becomes visible how data is constructing of bodies in certain ways, and how it also informs the positions of the artworks, tracing the pathways of *knowing:* for whom this benefit and how it is used. However, reflecting on how these body maps at once allow insights into how digital databases and healthcare governance policies create new conventions for "seeing" bodies, these experiments also somewhat reproduce this vision.[58]

For these reasons, it was important to me that the artistic practice was aimed at the live environment of maternity because it is within these contexts that data emerges as laboured. Rather than seeing reproductive bodies as passive sites, the context of data opens up to how bodies can be seen as either enabled or limited by the technical infrastructures that contemporary healthcare is made up of. Following Coleman's analysis of "becoming image" (2008), the concrete processes of becoming data, is not limited to one site or situation, such as a consultation with the midwife, but instead the nature of electronic database systems means that the digitalisation of individual bodies is immediately shared and distributed. As argued by Thomas (2013), how bodies are technically mediated *is* itself the reality of reproduction. Regardless of if it is the prematurely born baby being aided by technologies in the NICU or the database structures that unlock care packages, the technical

[58] The approach I take to mapping of the artistic practice might be considered partly as translational or transpositional, in the sense that I explore how data travels across different contexts, gaining new and different forms of value. The same data collected from a person expecting a baby might be used clinically by the midwife, mean something in terms of care for the service user, be used administratively by the commissioner, be used politically by organisations and government departments or be used to generate profit for private corporations. While translation point to the shapeshifting qualities of data, it also emphasises the focus on data itself, rather than its context, material resources or bodily and social costs. Importantly, exploring the more-than representational methodologies within the practice, the mapping methods I develop are positioned as a part of the feminist methodologies as a way develop a more contextual analytical view of the role of the production and use of data and also as a feminist methodology to map and to reclaim control of bodies' boundaries, which, in the digital age, are very much shifting and thus in constant need of locating.

infrastructures have become a part of how bodies are cared for and expressed. Equally, there is no operating technical infrastructure without the people entering data into it and maintaining it, so from the point of practice, it is impossible to separate when the body begins and ends.[59] This rendering of the body as a malleable process constructed in relation to data technologies extending beyond its material site raises new questions on how such a body is governed. As discussed in the *National Catalogue of Savings Opportunities,* how bodies can be worked upon through its data capture requires feminist theories to consider questions of consent and risk anew when the boundaries of the body are dislocated outside its physical site.

How new technologies extend the body politics beyond its physical site (Rose 2007), changes the way that experience is bodily. Whether a person is over-mediated (targeted), outside of mediation (missing from data) or simply mediated for profit, the individual has to concern themselves with the status of their data and how it impacts on the care they receive. Taking the data collection sites as a starting point to understand maternity allowed me to begin to examine the concrete processes through which reproductive bodies are expressed and mediated. The experiment *Allocation of Reproductive Responsibilities* reveals how concepts of biological sex and heterosexual reproduction influence the infrastructure of data collection, and in turn, the cultural format that the reproduction is made up of. This is not an innocent format, as argued by Murphy, who positions reproduction as a central site for biopolitical power, where some bodies are reproduced, and others let to die, rendering the maternity context as a site with enormous risks for the individual. These risks are not abstract; they are in the making through the way that healthcare is structured and produced through

the collection of data and the erasing of other data. To understand the production of risks within the digital ecology, we have to look towards the experience of data rather than a representation of data.

By designing the *National Catalogue of Savings Opportunities* as an intervention for the antenatal clinic, I explore how socially engaged artistic practice can address the risks and pressures that cost-optimisation measures introduce by openly sharing with people how their data is used. This format is an invitation to consider how data is not detached from bodies but produced through practice and processes that extend the body in ways that allow it to be conceptualised with other forms of data, such as location data, income data and other population identifiers. By engaging with people involved with the maternity sector such as activists, midwives, consultants, and commissioners, I learned how data is perceived differently across experiences and professions, and that the closer we come to the data producers (a person attending a maternity appointment), the more bodily the experience of data becomes. Whereas the commissioner will have an elaborate understanding of the administrative and political importance of data because of their training and access to using data within a professional capacity, people who produce such data, often do not. This to me does not mean that they do not know data and merely become victims of larger bureaucratic systems, but instead, means that the practical and bodily forms of knowing are often not considered valid ways of knowing a technical system. The feminist modes of thought were therefore much needed to recognise and validate bodily forms of knowing in developing an account of data as lived and experienced.

However, the way that I have conceptualised the movement of data between an individual and a larger system somehow also reproduces the understanding of the body politics of data as an individualised notion between human and machine. In the next chapter, I will discuss a series of experiments where I look at how to widen the space, I create within the artistic practice to consider

the digital from a collective perspective, and as such, I make room for thinking the embodiment of data as situated.

CHAPTER 7

LABOUR

In the following chapter I return to the starting point of the research: *movement*. Whereas the projects on maternity data show how bodies are affected by the data they produce, I explore how to expand the understanding of digital embodiment beyond the movements of user-technology interactions. I problematise this standard relation that often becomes the starting point for theorising the embodiment of digital technologies, such as seen in the work of Featherstone, Mark Hansen and Brian Massumi. Can the situated perspective of labouring processes in "big data factories" offer new perspectives to understand what bodies are, in fact, a part of the digital and under what conditions? I explore how drawing on the lived experience of workers can challenge the artistic methodologies that position digital matter as a free and neutral resource for artists to use within their practice. I will focus on discussing the workshop model *Data Collage* (2017) created in collaboration with Bogers as a part of the exhibition project *Data Therapy.*[60]

The project began by building an image archive of 6000+ user generated images about pregnancy shared on Twitter over a three-month period. From this body of images, a series of experiments were created to explore the status of the body including the stop-motion films *Diagnostics v-01* (Korean version, 2017), *Diagnostics v-02* (English version, 2017), the postcard collection #expecting #care #cards (2017) and the workshop model *Data Collage*.

Artistic Material: Porn in Numbers

The material used in the project is created by using the Twitter Capture and Analysis Toolset (TCAT),[61] which, after a 3-month period, had accumulated an image archive containing mostly porn

[60] It was developed in collaboration with Bogers during a residency at the Makers Lab University of Applied Sciences (NL). The outcomes of this project were commissioned by Art Centre Nabi (SKR) and exhibited in the group exhibition *Neotopia: Data and Humanity,* Art Centre Nabi, Seoul, 01.11.2017-03.01.2018.

[61] The TCAT tool is developed by the Digital Methods Initiative at the University of Amsterdam. For later workshops we used scraper tools to explore image repositories on particular websites. A scraper is a piece of software created to copy specified content (images, text, phone numbers, etc.) from websites and dump it in an accessible file format such as csv (comma separated values that stores tabular data).

advertisements[62] (over 60% of the images), home-made pregnancy porn, blowjobs, cocks and boobs, followed by other substantial sums of images of pregnant celebrities, disgusted men's faces, fashion and beauty pictures, fitness selfies and food advice for pregnant women.[63]

As opposed to a private user's account, the TCAT gives a broader view of the content that populates the Twitter platform because it stores the tweets as they are uploaded and captures data associated with them such as images, hashtags, text, time, location, id and frequency (Bruns et al. 2014). While platforms depend on users to continue to produce content, the content that users have access to is generally curated as *echo chambers* (Apprich et al. 2018, 9).

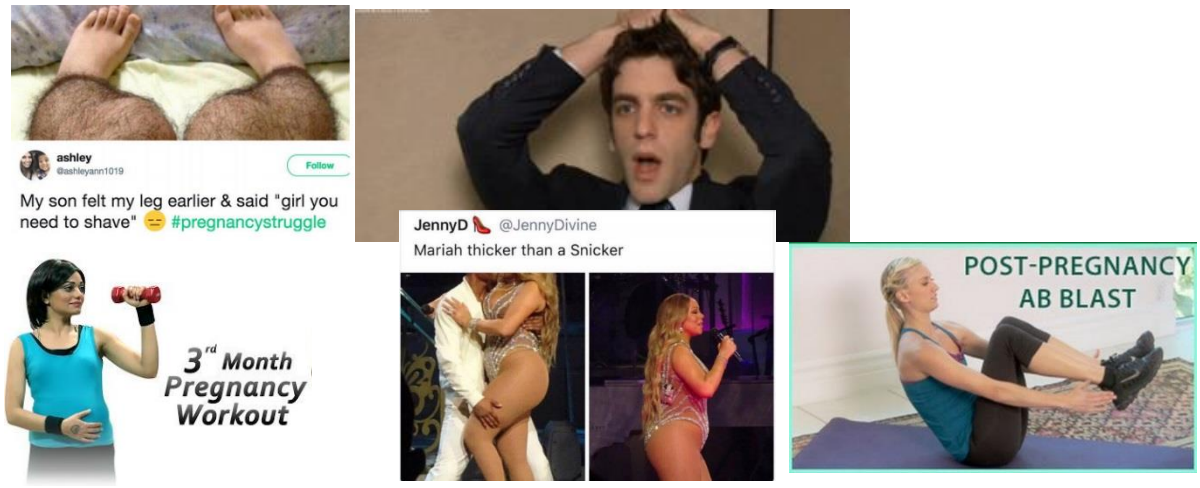


Figure 22. Twitter Capture, 2017, screenshot of image material.

[62] Porn has always had a special place on the internet. It is estimated that around thirty percent of all data transferred across the internet is porn related. This, however, must be considered in the scale of the internet, of which its estimated that only sixteen percent of the internet is searchable through search engines such as Google, DuckDuckGo or other services. The majority of the Web is not indexed, often also called "the dark web," which is characterised by anonymity granted to site owners and users through onion browsers such as Tor that mask the identities of users and site providers.

[63] We conducted two separate data captures from which two separate films were created, one scraping images from the English speaking Twitter, the other scraping images from the Korean speaking Twitter for the work exhibited in the *Neotopia* exhibition in Seoul. The English Twitter capture was substantially larger than the Korean capture, not only because it ran over a longer period of time, but also because the largest user groups are from the US and the third largest are UK users. While the second largest user group is Japan which is neighbouring to South Korea, the platform is not as widespread in Korea as other social media platforms such as Kakao Talk, Band and Naver Search engine.

Companies organise content with sorting algorithms that feed content and advertisements to users based on the view that the algorithm thinks the users already holds, and as such, reinforcing existing values, lifestyles and opinions.[64] Far from being a neutral view, the authors of "Pattern Discrimination" argue that users' access to content is crafted with technical methodologies that are influenced by racist and misogynist concepts of discrimination.

> In parallel to the development of racist ideology, discrimination since then has referred to a prejudicial treatment of individuals based on a social category (e.g., race, gender, sexuality, age, class). However, in different terminologies the original meaning of the term has been preserved. This is why in computer science "pattern discrimination" is still used as a technical term to describe the imposition of identity on input data, in order to filter (i.e., to discriminate) information from it (Apprich et al. 2018, 10).

The way that such technologies operate in the background is only experienced as the lack of diverse content from the perspective of the user because they are trapped in highly curated *echo chambers* created by processes of pattern discrimination (Apprich et al. 2018, 9). Therefore, any one individual user would probably never experience the scale of misogynist content that we found in the TCAT image collection within the feeds of their private social media accounts.

The way that new economic systems such as surveillance capitalism allow for human activity to be reconfigured as financial value has raised new debates about how to understand content produced on social media platforms as well as the role of the *viewer* and the experiencing body in online visual cultures. Platforms such as Twitter, Instagram and Facebook "humanise" their interfaces to appeal

[64] How the algorithmic curations of information, *echo chambers,* skews people's perception of online reality was both at the centre of the Brexit Referendum in the UK (2016) and the Trump election (2016), following the Cambridge Analytica scandal in which it was revealed that Facebook was leaking data that was used to target political opponents by feeding them particular forms of content. The making of new business models based on user's personal data and the data captured from ongoing use of commercial applications is covered widely in Tactical Tech's research project *Inside The Influence Industry* (2019), in which they look at the rising number of companies offering political advertising models, voter targeting and population modelling with data driven methods.

to existing social practices, such as when Facebook encourages users to "share" their state of minds, opinions and images from their life, however, the "who" we are really sharing with is not our friends and family, argues Paglen, instead

> When you put an image on Facebook or other social media, you're feeding an array of immensely powerful artificial intelligence systems information about how to identify people and how to recognize places and objects, habits and preferences, race, class, and gender identifications, economic statuses, and much more (2016).

If we follow Paglen, the 6000+ images that we harvested from Twitter should be theorised as a surveillance resource within machine to machine systems rather than images made for human viewers. He argues that the meaning of images is no longer oriented towards the *seeing individual* from which theories of visual cultures have traditionally evolved.

> Regardless of whether a human subject actually sees any of the two billion photographs uploaded daily to Facebook-controlled platforms, the photographs on social media are scrutinized by neural networks with a degree of attention that would make even the most steadfast art historian blush. Facebook's "DeepFace" algorithm, developed in 2014 and deployed in 2015, produces three-dimensional abstractions of individuals' faces and uses a neural network that achieves over 97 percent accuracy at identifying individuals – a percentage comparable to what a human can achieve, ignoring for a second that no human can recall the faces of billions of people (Paglen 2016).

Following Paglen, the fact that Facebook images go towards developing the DeepFace algorithm, where "[…] the overwhelming majority of images are now made by machines for other machines, with humans rarely in the loop […] " (2016), renders the subject-image relation irrelevant. The status of the digital image (image as data) as autonomous, also described by Hansen as a "a non-perspectival data set" (2001, 81), has ways of understanding digital visual cultures because the "computer vision marks the moment when the ontology of the technical image becomes radically autonomous from

the perceptual analogy of natural and cinematic vision"(2001, 81). Following these accounts, the appropriation of user's content for the training of new surveillance products is centred as the main concern, suggesting that the human body is marginalised by the interests of surveillance capitalism. This position, even when aimed at reflecting critically on corporate data practices, risks reinforcing its own totalising fantasies of data practice. In other words, what D'Ignazio and Klein termed *Big Dick Data.*

> Big Dick Data, a formal academic term coined to denote big data projects that have masculinist, totalizing fantasies of world domination through data capture and analysis. Big Dick Data projects ignore context, fetishize size and overstate, inflate their technical and scientific capabilities (2020, 2920)

Paglen's view on how new corporate computational practices are aggressively subordinating users to large-scale data processing operations within the surveillance economy defines machines and humans as separate entities, erasing the view of how big data factories operate in practice. By drawing on labour practices, we can expand the concept of digital embodiment beyond user-computer interactions and contextualise them as new forms of work. I think that Paglen's statement: "There's no obvious way to intervene in machine-machine systems using visual strategies developed from human-human culture"(Paglen 2016) uncritically perpetuates ideas of an abstract *human body* and erases the potential that workers play in the digital economy in terms of resistance.[65] Equally, it

[65] It is argued by Rosie Braidotti in her account of the *posthuman* that the concept of human has never been very spacious as it refers only to the privilege of the white male middleclass viewing subject, which in the context of media theory would translate well into the position of the viewer (Braidotti 2013). Aph Ko and Syl Ko equally analyse what bodies have historically been included in the concept of the human, exploring experiences of being a non-human human (2017). The position of playing the role of viewing subject has almost single-handedly been occupied by the middleclass male throughout Western history. One could therefore argue that the position of the viewing subject, which Paglen argues within the surveillance context is redundant, has only ever been accessible to a small segment of society. For the rest, visual cultures have been about the reinforcement of a position of power and the production of gendered and racialised bodies as objects.

reinforces the existing idea within art and technology practice that technologies should be defined in terms of their technical and novel capacities and not in terms of their social or material sites.

Experiment: Collaging Big Dick Data

In order to develop a way to work on the archive, we first took a traditional visualisation method by using the opensource Image Sorter Version 4.2 Beta software to organise the collection. The software offers organisation methods to sort the images according to name, date, size and colour, allowing us to see the collection from the perspective of its formal qualities.[66]

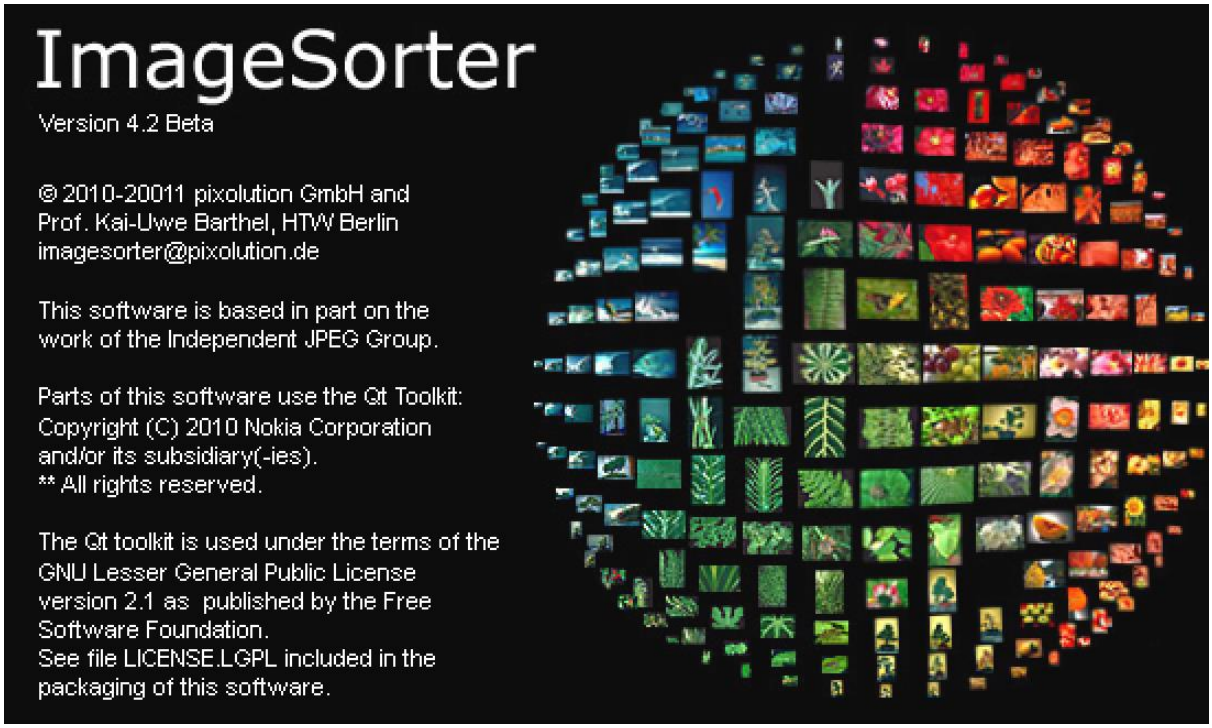


Figure 23. Pixolution GmbH and Prof Kai-Uwe Bartel, *ImageSorter Version 4.2 Beta*, screenshot of s*oftware, 2019.*

[66] We also used visualisation tools such as Gephi to explore the image data (metadata) of the capture, which allowed us to see network nodes, communication patterns, geographical sharing patterns etc., however, because these tools are designed with the aim to provide insights into the data and we wanted to explore how to return the data to bodies, we decided not to pursue further the visualisation experiments.

The process included downloading and formatting the images,[67] selecting the image folder through the ImageSorter software and choosing organisational method for the final visualisation of the image archive. Large sections of the final visualisation map were covered in light salmon coloured cubes but the naked bodies of Caucasian sex cam workers were not visible. The ImageSorter tools enabled a process in which the content of the images recedes into the background as formal qualities such as frequency and colour take precedent.

[67] The scrape is downloaded as a cvs file with url links to the individual images shared. In order to download the individual images, we used Google spreadsheets with the "=IMAGE" formula. We published the spreadsheet as a Google Fusion table from which we were able to use the browser plugin "DownThemAll" which downloads all the images at once into a folder.

Figure 24. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *ImageSorter map,* 2017, data visualisation of Twitter capture.

Data Therapy

[healing required]

How does the digital hurt and please, and - if possible - how do we recover?

Carved out of the digital, the artist group The Body Recovery Unit uses their ultra precise visual diagnostic tools to uncover the pressures around pregnancy and family making lurking underneath social media platforms.

Twitter Scrape Details

70.120 tweets in English, 6.553 images. Query: pregnant, pregnancy

61.091 tweets in Korean, 1.938 images. Query:

성건강, 모성보건, 모유 양육, 모유를 먹이다, 분만, 분만실, 수유, 수유하다, 임신, 임신한, 조산사, 출산하는 것, 출산하는것, 출산하다

Tools & Materials Used

Images from two twitter scrapes harvested and analysed in 2017 using Digital Methods Initiative's Twitter Capturing and Analysis Toolset (TCAT), Gephi and ImageSorter.

Diagnostics: Twitter image content

Category #1: Family

EN: able bodied cis couples and families, groups of people, pregnant women together

KR: able bodied cis couples, able bodied cis families, groups of people, TV show

Category #2: Expecting

EN: anxiety pictures, disgusted faces, surprised faces, piggy bank

KR: baby insurance, career memes, expectation memes, disgusted faces, surprised faces, heterosexual cycle of life, abortion, responsibilities, contraception, selfish memes

Category #3: Capitalism

EN: able bodied celebrities, cuts to public services, cuts to pregnancy programmes, pregnancy and health advertisements, porn site advertisements

KR: film advertisement, celebrity culture, McDonald's food

Category #4: Appearance & body image

EN: able bodied people, cis women, before/after bodies, beauty shoots, fashion selfies, fitness women, glamour pictures, bellies, stretch marks, exercise, celebrities. models

KR: able bodied people, cis women, fashion selfies, glamour pictures, movie posters, film clips, K-pop stars, celebrities, fitness girls, models

Category #5: Porn & Pleasure

EN: Masturbating able bodied women, front poses, ass shots, breast shots, heterosexual intercourse, naked selfies, blow jobs, vagina close-ups, erect penises, candid naked pictures

KR: erect penises, ass shot, heterosexual intercourse, dirty underwear, sperm

Category #6: Others' Advice

EN: exercising able bodied white cis women, infographics, mental health, alcoholic drinks, medication and vitamin pills, pregnancy medical aids and tools, logos of plans and guides, vegetables, fruit, fish, ice cream, cake, pizza, hamburgers

KR: responsibility memes, baby insurance, heterosexual life pattern

Figure 25. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *Twitter data overview*, 2017, poster from the installation Data Therapy, Neotopia, Art Centre Nabi.

Sitting back and letting the software plough through the images and organise them into colourful patterns had an almost satisfying feel to it, and the prospects of the many potential visual forms that the computational rendition of the archive could produce were seducing. However, once we began to look more closely at the individual images to interrogate how the pregnant body is framed by online ecologies of images, the content took the foreground and the experience turned increasingly uncomfortable because once we clicked through what felt like endless streams of "dick pics," pregnancy porn and celebrity selfies. From the ImageSorter map we created a folder with unique images from the collection, examined the number of times individual images were shared and analysed the content of the images. We ended up working with six categories that dominated the collection. *#porn* and *#family* pictures of heterosexual cis couples were included. *#expecting* was included because of the high number of tweets with negative messages about the prospects of becoming a father or ridiculing images of expecting mothers and their motivations. We also created a category for *#capitalism* because of the abundance of images of able-bodied celebrities and private health insurance advertisements. Some of the most shared images were about *#appearance and body image* and included professional as well as personal selfies showing body fitness, make-up and work-out regimes. After organising the images into separate folders according to the topics, we printed out the images. Piling up in the six paper bundles, we decided to destroy the images instead of continuing to analyse them. Image by image, we cut them into pieces and then organised the cut-outs piles of arms, fingers, cocks, breasts and smartphones. From there, we began to assemble new images and stories from the cut-up materials, creating small stop-motion scenes for each social pressure identified: beauty, porn, capitalism, expecting, appearance and body image and family.

Figure 26. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *Twitter Capture Image Archive*, 2017.

Figure 27. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *Data Collage*, 2017, process.

In the end, we combined the stop-motion segments into a film, *Diagnostics* (2017), consisting of the six chapters from the dataset.. The film responds to the how the reproductive body is framed by the capitalist production of images on Twitter by destroying and appropriating them as source for the creation of counter stories and images. Each of the stopmotion chapters takes a different stand on the topics in relation to pregnancy being coded with the language of porn, capitalism and neoliberal health agendas. While the individual scenes are created by Bogers and I, the image credits included at the end of the film points to the thousands of users behind the original tweets, drawing the user's bodies into the work.


CHAPTER #3
CAPITALISM
PM
UPDATE


CHAPTER #4
APPEARANCE & BODY IMAGE

Figure 28. Jønsson, Alexandra and Loes Bogers (The Body Recovery Unit), *Diagnostics*, 2017, stopmotion film chapter overview 3-5.

But *who* the producers are is not a straight forward question, because the results are laboured by individual users as well as marketing machines (bots), both of which make up the demographics of Twitter as a commercial platform.[68] A large part of the image collection was visibly automated content, such as the segment of sixty percent of porn advertising. However, considering the images as an archive, it was hard to see the content as neutral "blobs" of data or to disregard the *viewing* experience altogether, as suggested by Paglen. Regardless of if you choose to see the digital image

[68] The company Twitter has around 326 million monthly active users, 100 million daily users and produces around 500 million Tweets per day. Content on Twitter is made by both individuals, of which the largest user group, making up 37% of active users, is young people (18-29) and automated bots[68] who could account for as much as 24% of users, businesses, celebrities and organisations who use the platform to market their services and provide customer support (Aslam 2018).

algorithm, a raw binary collection, or you see the content, a penis ejaculating onto a pregnant woman's belly, it is *both.* From the perspective of computers at the most rudimentary level, the images are binary data but the contexts of such images are equally real. How they are made, the economy that requires them to be made and the misogynist cultures that grows the desires for such images do not disappear because the image becomes computable. If anything, the problem increases with the rise of computational misogynist cultures.

The processing of destroying the images one by one made me reflect on the ownership of these images: who do they belong to? This is a question that is not often asked within the field of art and technology, because the benefit of working with data is that it can be obtained for free on the internet, such as we did ourselves. Reckitt suggests that the minimalist artistic practice had an inherent class problem in terms of appropriating the materials of the wood, metal and concrete in their work, without referencing or responding to the politics of the workers in such industries (Reckitt 2013). This problem is equally interesting for the field of art and technology because as an abundant and often free resource is used by artists to create new interesting visual strategies, as seen in the work of Klingeman, who trains painting algorithms using porn from the Internet. However, the material and labour ecologies of data is, however, rarely referenced. Without critically considering how digital matter is framed by corporate practices, artists risk reproducing the same positions and aesthetics within their work.[69] Returning to the question of how to understand the ownership of

[69] A range of individual artists such as Ingrid Burrington and Mirko Nikolic, who both examine the mining of natural resources that underlie digital industries, work to bridge this gap as well as Martin Howse and Jonathan Kemp who use the metals from ewaste to address the material cycle of the digital. Other areas such as Heather Dewey-Hagborg's work on biological surveillance address this in the context of bodies. In media practices such as that of Fathima Nizzarudin, who examines the lived reality of nuclear power resistance in Kudankulam, India, gender is addressed in performative filming strategies of documenting the resistance in local communities by problematising the traditional male gaze of documentary film making.

these images beyond proprietary logics of online corporations, I want to draw out the kinds of labour that can be identified in the collection of images harvested on Twitter.

Digital Work

The labourers that could easily be identified from the TCAT archive was the cam sex worker, the social media user, the influencer and various Twitter bots. The porn advertisement images are most likely created by sex cam workers, the home made porn by individuals whose private images have been shared consensually or not; and the "fit" pregnancies, protein shakes and work-out images are probably created by working bodies of social media users or *online influencers*.[70] Online work itself has been discussed by Terranova who argues that workers labour in 24/7 electronic sweatshops, (2000) while other writers raise issues of the emotional labour that online racism and misogyny presents to women, black people and feminists on the Internet.[71] Aph Ko and Syl describe the exploitation of black talent on Instagram as *technologised sharecropping,* pointing to how the structural condition of online work mimics older forms of colonial exploitation (2017, 95–105). Why discursively separate the violent content from the structure of the platform when, from the perspective of a worker's body, this gap is lived? Workers are sold the dream job, *playbour,* but the reality of online influencing is different. Youtuber Matt Lees describes the experience operating within the capitalist economies of social media.

> […] YouTube heavily boosts anything that riles people up. It's one of the most toxic things: the point at which you're breaking down is the point at which the algorithm loves you the most (Parkin 2018).

[70] Online influencer is a term that covers the position of networked marketing workers such as bloggers, vloggers, Instagrammers and Youtubers who, because of their large following, have the ability to influence the behaviours and opinions of others.

[71] Bodies have always been a battleground online, and in recent years, a growing number of online debates have put focus on the implications of constantly sharing police violence and more direct racist abuse and threats. These concerns have been raised by several online workers such as *Sister OutRider,* and *Black Girl Dangerous* as well as antiracist and social learning groups on social media.

Online workers must adapt their routines, thoughts and emotions to the speed and frequency of algorithmic processes to cope mentally with the constant demand for content to keep the algorithm "interested" while connecting with thousands or even millions of other users on a daily basis.

Because of the experiences of using my own eyes to work with the Twitter image collection, I began to notice what this process required from my body. My eyes were strained from starring at one image after the other, my neck was aching from sitting at the desk and I felt mentally exhausted because my mind had no meaningful or constructive way to process the images I was looking at. It was by enlisting these emotional processes as a tool that I was able to orient the analysing of the images in a new direction. Working from the experience of looking, sorting and cutting the images from Twitter, it became clear to me that it is not sufficient to take users' experiences as a "standard body" in the theorising of digital embodiment because the experiences of workers radically differ.

Why did the TCAT image collection contain so much more porn and offensive imagery than a mere hashtag search on the Twitter interface? The answer is to be found in the labour of a low-paid worker in Manila, namely the commercial content moderator.[72] Commercial content moderation is defined as an "organised practice of screening user-generated content (UGC) posted to Internet sites, social media and other online outlets in order to determine the appropriateness of the content for a given site, locality or jurisdiction" (Roberts 2017). Facebook alone employs over 15,000 content moderators who sift through up to 2,000 images per hour removing porn, violence, gore, nudity and sexual solicitation from the sites. While Paglen's argument promotes a view of data-driven platforms that are beyond the human viewer, the work of content moderators evidences the exact opposite:

[72] Because the TCAT sits and collects live data from Twitter, the content in the TCAT is most likely less moderated than what is on the platform publicly.

the cleaning of online platforms directly depends on a pair of human eyes studying the appropriateness of social media content. The film makers Block and Riesewieck, who document content moderation workers from Manila in their film, describe that

> […] humans are better at analysing a picture and piecing together what it really means. But it comes at a cost. The pair called the digital cleaning job "a form of mental abuse." One moderator was an expert at beheading videos and had seen hundreds of them. Another spoke about how viewing child porn disturbed her forever (Lekach 2018).

Like other workers in the big data industry such as click-workers, transcriptionists, human-raters (Bilić 2016) and data entry workers (or mechanical turks) that train networks by manually coding images, the lived experiences of online content moderators are generally not represented in work on digital embodiment.

Project: Data Collage

The work *Data Collage* is a process rather than an object. First, participants are invited to do the work needed to clean the dataset: use their eyes to study, select and destroy the images captured from Twitter that are presented to them in a series of folders. Secondly, the participant takes their selected materials to one of the GIF-maker stations[73] and begins to create their own content from the cut-up materials to compose a GIF, a sticker or a longer stop motion film.[74]

[73] The GIF-maker stations were designed by Bogers and digitally fabricated by myself during my residency at the Fabrication lab Westminster (April-June 2017).

[74] A GIF (Graphics Interchange Format) is a moving image consisting of ten to thirty frames; a sticker is one image with transparent background. Both are formats that are frequently used in texting and social media applications. A stopmotion consists of 60-130 frames for a short scene.

Figure 29. Jønsson, Alexandra and Loes Bogers (The Body Recovery Unit), *Make Your Own Throwback Sticker Pack*, 2019, data collage process, Late Tate, Tate Modern, London.

The workshop model shifts the orientation of the practice from visualising data contexts to performing the movements of data practices by drawing on the labouring positions of data work. Instead of the practice serving as a site that privileges the viewer, the workshop invites the participant to perform the labour of the content moderator by presenting them with the collection of images from the Twitter archive.[75] Cutting up the images gave the participants an opportunity to be creative

[75] Public exhibitions and workshops include: Body Recovery Unit, *Data Therapy*, *Neotopia: Data and Humanity* (2017), where we used a Korean Twitter TCAT to create a longer stop motion film in collaboration with the curatorial team at Art Centre Nabi; *FabFest London* (2018) in the event *The Big Data Cut-Up* (2018), where participants were invited to use the English pregnancy Twitter TCAT to create GIFs in response to the theme of the digital body; at the Maternity and Art conference *Oxytocin Mothering The World* (2019), where we were invited to use the TCAT to make queer pregnancy and parenting sticker packs from the very heteronormative material; and at *Nostalgia* at Late Tate (2019), where people

by literally destroying the toxic imagery surrounding pregnant bodies. Recomposing the cut-ups into new images, stickers or GIFs enabled participants to create their imaginaries of pregnancy and family making instead of reproducing the misogynist material from Twitter. Rather than situating the participants in the comfortable position of "looking" at a clean data visualisation or map, we created a process through which the participant could experience themselves as implicated in the production of online visual culture.

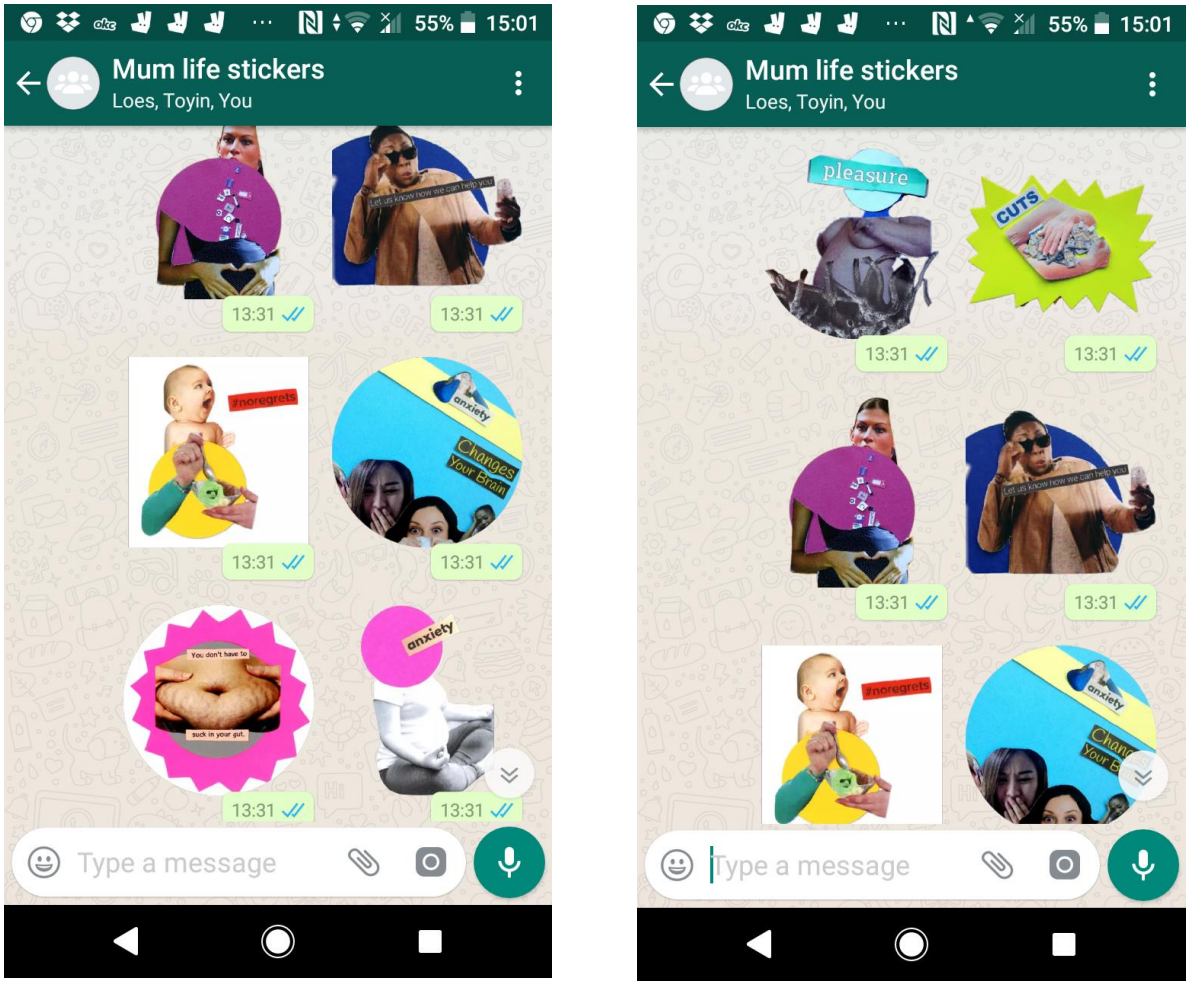
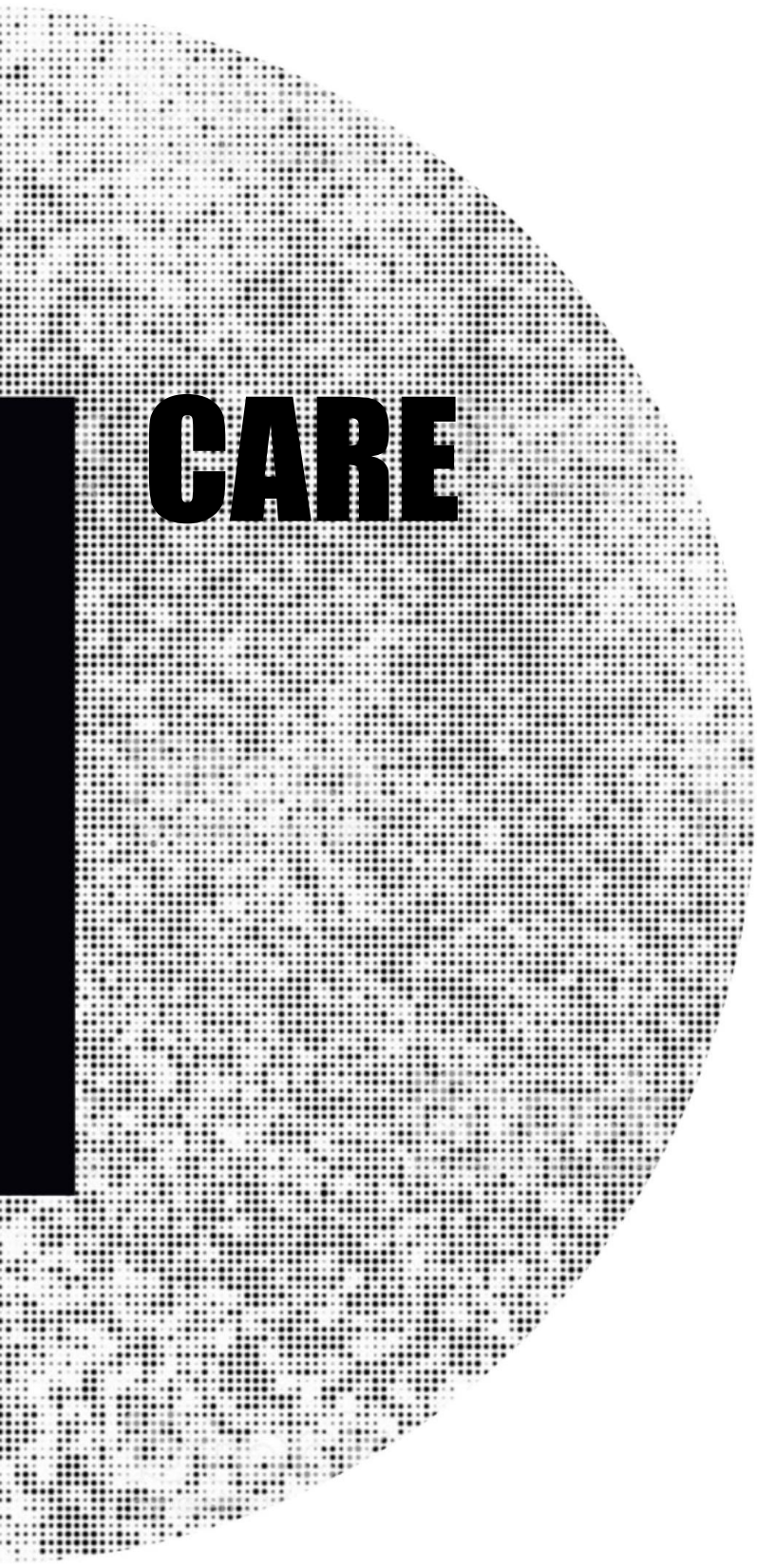


Figure 30. Alexandra Jönsson and Loes Bogers (The Body Recovery Unit), *#mumlife sticker pack Packs*, 2017, screen shot of digital sticker pack.

collaged new content from 90s capture. From the workshop series, a collection of stickers was made, such as the #mumlife sticker pack, #queerparenting sticker pack and a series of GIFs responding to the content of the capture.

Figure 31. Participant sticker, 2019, from The Body Recovery workshop, *Make Your Own Queer Parent Stickerpack,* at: Oxytocin: Mothering the World, London, UK.

CHAPTER 8



Drawing on the learning outcomes from the *Data Collage* project, in this final project I use collage and performative strategies of care to contextualise the movement of labouring bodies within the globally distributed data industry. Rather than mapping the movements of the data producing body, I begin to explore the question, what will it take to heal? Thinking with Barbagallo and Federici's concept of *self-reproducing movements,* I explore how care practices can be formulated within feminist artistic practice as a practice of resistance.

> We believe that it is important to engage in this analysis because the struggle over "reproduction" is central to every other struggle and to the development of "self-reproducing movements," that is movements that do not separate political work from the activities necessary to the reproduction of our life, for no struggle is sustainable that ignores the needs, experiences, and practices that re-producing ourselves entails (2012, 2).

In the project *Accumulative Care,* I explore how specific self-producing movements, such as the practice of identifying and recuperating the constantly shifting body boundaries in the context of digital work, can become co-constructing of a practice of care for the digital age.[76]

Artistic Material: Experience

The material for this series of experiments is through processes of rendering experiences themselves visible. This is informed by the *paradigm of embodiment* (Blackman 2008, 33–37), in which lived experience is validated as a way of knowing the body separate to external physiological and emotional cartographies of the body. I make use of this paradigm of becoming bodies to explore the potential for individuals and collectives to become agents for defining their own bodies in the context of the

[76] My understanding as care as *organisation practice* was equally informed by participating in the events *Collective Practices of Care in Experimental Performance* and *Take The Money and Run* organised by the research project *Managing the Radical*, a collaboration with the MtR Action Research Group (Amit Rai of the Business and Management School and Nick Ridout of the Drama Department of Queen Mary University of London; producers Orlagh Woods and Gini Simpson; and Cecilia Wee of Artsadmin).

digital. I explore this through a series of experiments in articulating the diverse bodily experiences, muscle pain, social pain, or financial pain, to be identified as accumulating across the body's processes as it is paced by computational speed, scales and rhythms.[77]

Experiment: Mapping Risk

By working explicitly with care as method, the boundaries between work, labour and care can be questioned. I set out to explore how the specific relations between digital platforms, hardware and bodies might be articulated and defined as occupational risks. In the box of my newly purchased Logitec mouse and keyboard, I found the technical specification and user manual, which contained a definition of risks in relation to using the hardware. I used the risks listed in the manual to create the drawing *Hardware Specific Pain,* in which the risks appear within an outline of my body. The map points to the budding relationship between hardware and the health of my fingers, hands, wrists, arms, neck and back, as conceptualised commercially for insurance purposes, revealing a commercial definition of the body.

[77] The approach to mapping *hurt* was informed by installation *Data Therapy* (2017) developed by myself and Bogers, and the mapping methodology for the "felt" body was initially developed for an experiment in mapping the midwife's body. I asked a group of midwives to describe how they experienced their bodies during a working shift. The descriptions, which included "bursting bladder, heavy and achy feet, and minds that have been whisked", informed the creation of a body-specific map for midwives, that I used to create the relaxation exercise for the staff called *A Whisk In Your Head* (2017). The midwife relaxation exercises were recorded by Toyin Adeyinka and installed for midwives to use at Lewisham maternity ward on two occasions during midwife wellness-day. The map refers specifically to the body parts and feelings that midwives deal with due to the nature of their jobs, their working environment, and the political and practical pressures that are negotiated on a daily basis. The maps thus do not follow physiological or psychological schema, but instead they give an impression of how the body is experienced by the person living in it through its work.

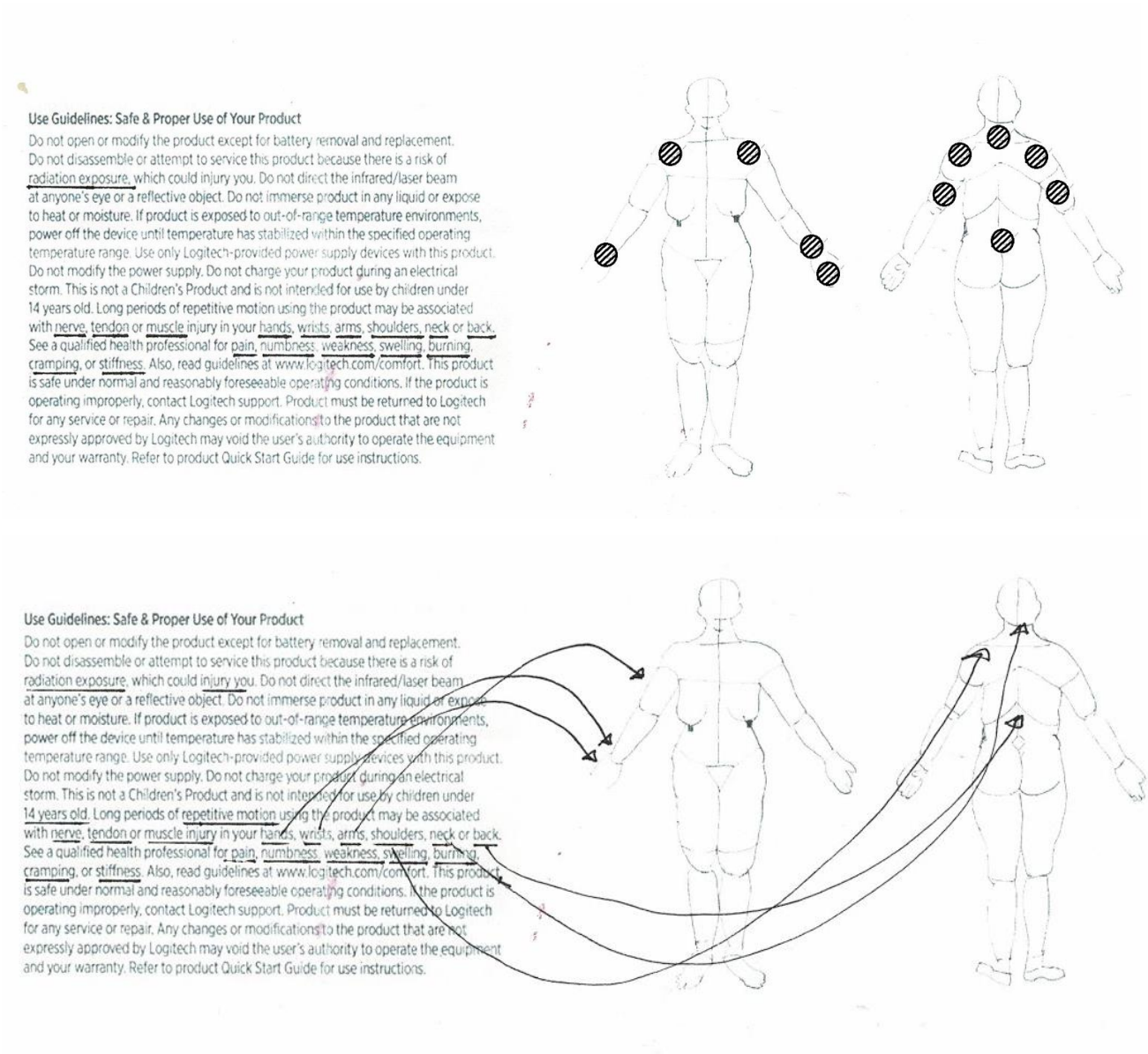


Figure 32. Alexandra Jönsson, *Hardware Specific Pain,* 2015, ink sketch on Logitec Use Guidelines.

The practices of risk assessment are generally conducted for the purpose of managing risks, which in turn normalises the idea of risk within its own framework. On the contrary, the emphasis on repair, allows for the labour that it takes to be *at risk* to come to the fore. If we only rely on the body's experiences, aches, thrills, and pains, how then would the digital be portrayed? I go on to explore

what a body map looks like if the power to define these risks are in the hands of the individual experiencing them. I practised noticing the locations of certain digital routines in my body, such as when the long hours of sitting in front of the screen writing materialised in my lower back as pain, or when commenting publicly on a Facebook thread would linger in my stomach as feelings of anxiety. I did so by writing them down and then mapping them onto areas of my body in the drawing *General Digital Pain*. To further develop the conceptualisation of my own body as a movement of being reorganised by the digital labour, I formalised the methods in three steps: *body experience* (i.e. long working hours, social media anxiety, repeated typing, precarity, paranoia), *body parts* in which these movements can be felt (i.e. fingers, wrists, shoulders, gut) and *potential repairs* (touch deprivation, stiff fingers, shoulder pain etc.). This three-step methodology allowed me to build a body map that simply follows the order of experiences as they are told by an individual.

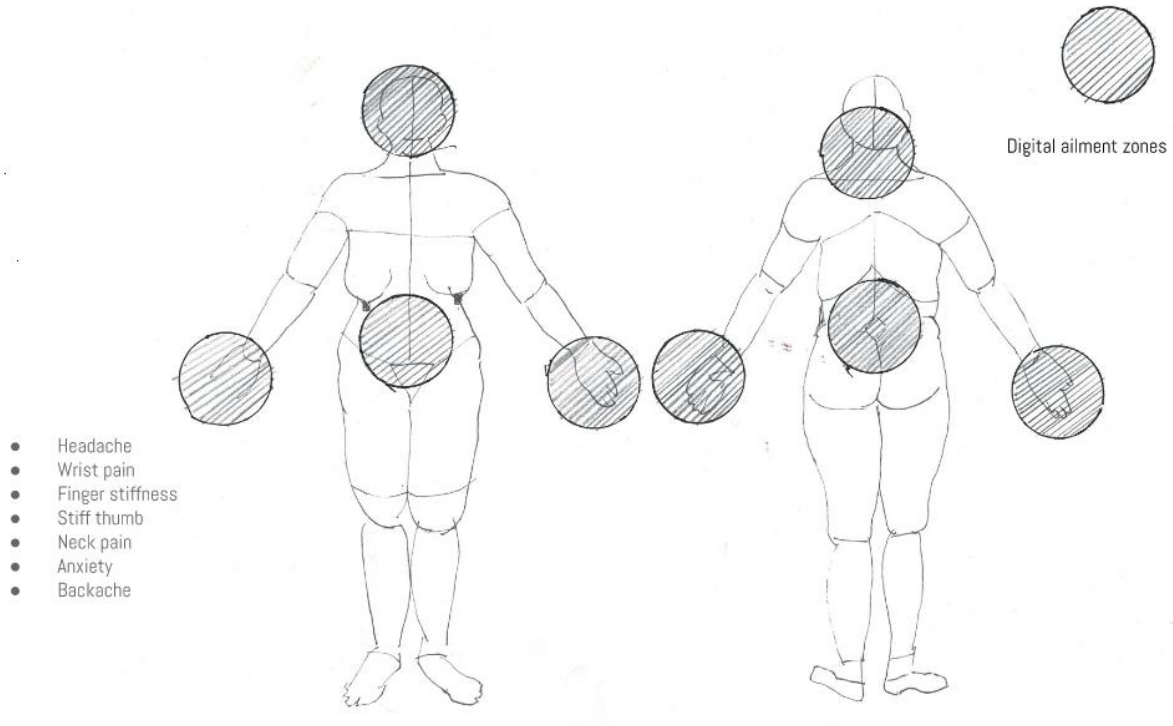


Figure 33. Alexandra Jönsson, *Mapping Risk 01 (general digital pain*), 2015, drawing, ink on paper.

Initially, I used the visual format of the "full frontal body" for the maps, however, the visual format itself reproduces the body as fixed in space, which is a perspective that is never experienced. I went on to explore existing approaches to how artists have imaged the body as reorganised by machines, desire, or perception, such as the work of Laura Satz's work *I Am Anagram* (2005), an installation created as a space of preceptory illusions with mirror boxes, the audience can experience parts of their bodies as dismembered or reorganised. Satz draws on the German sculpture Hans Belmer's series of dolls with reorganised body parts from the 1930s, which he modelled from the body of artist

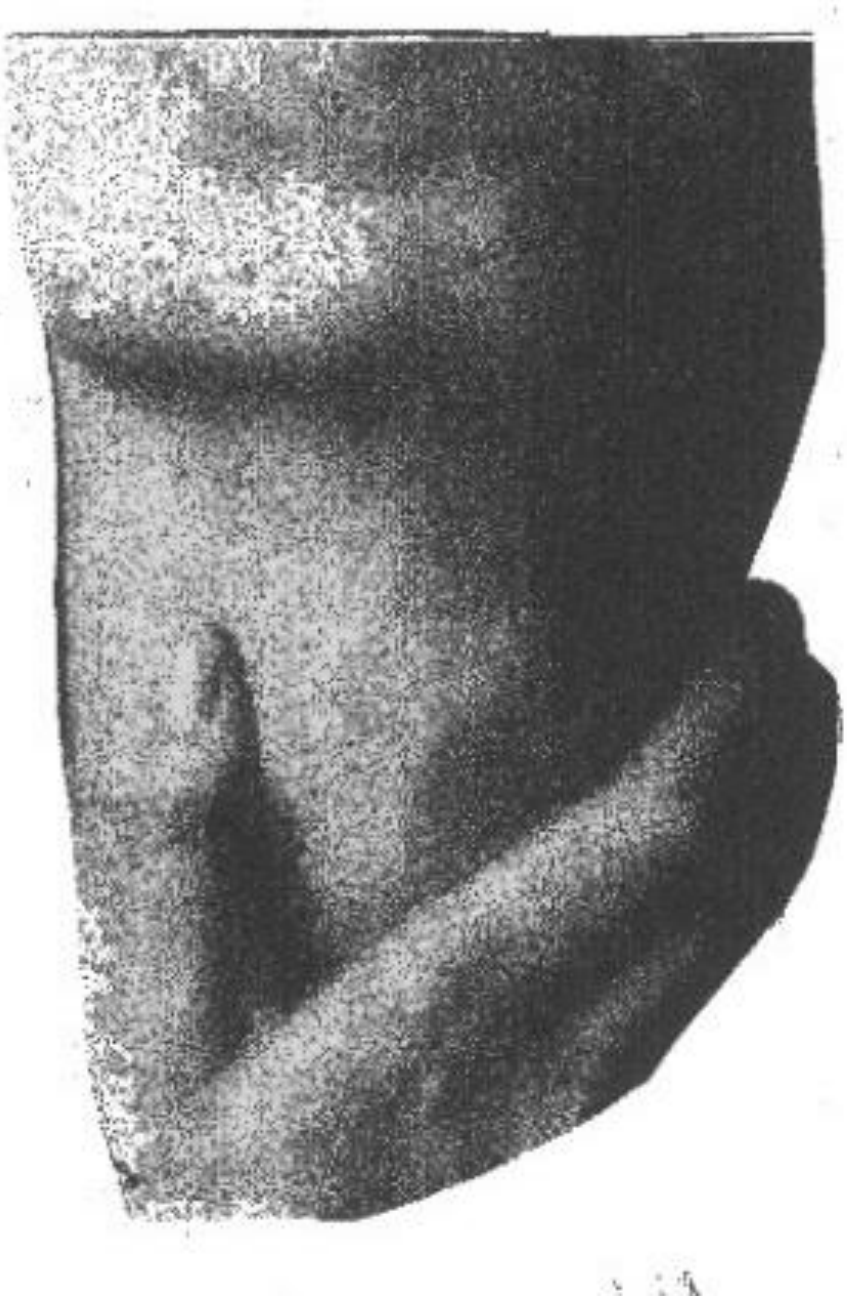
Nana Gimszi, who was also his partner (Satz 2010). The work was at the time was seen as a rejection of Nazi eugenics, however, it could equally be seen within the context of Belmer's own imagination of his partner and his desire to alter and/or control her body. In the development of the body maps, the anagrammatic approach allowed for mapping to be conceptualised as a process, and therefore, as a body map that must be *created* rather than be seen. In this way, the *felt* body can come to the fore of the visual process and the altering forces can be identified and questioned. Belmer's processes of reorganising the image of his wife's body in his artworks, raises questions of who benefits from this reorganisation of the body and warns of the potential violence of imagining bodies within artistic practice.

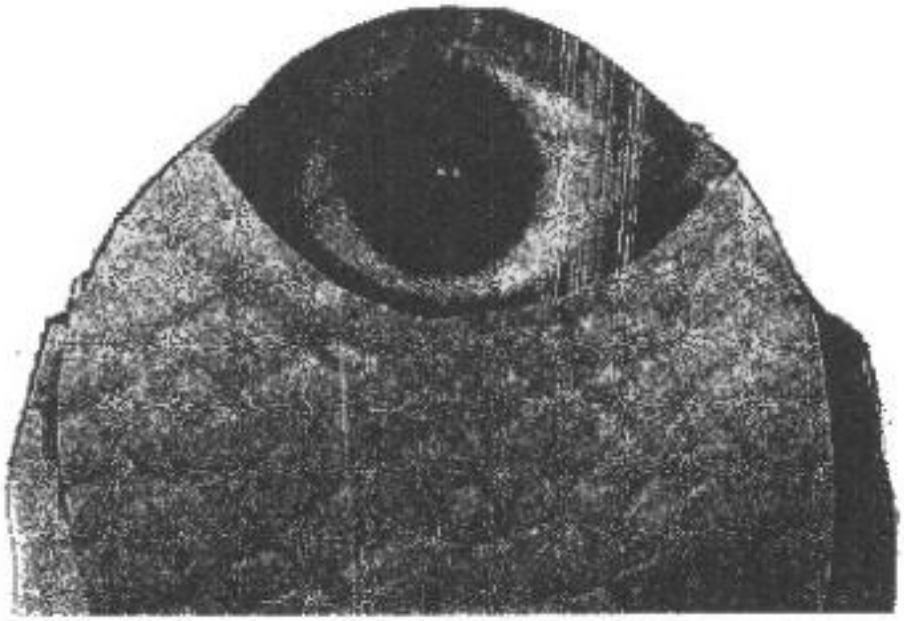
Project: Accumulative Care

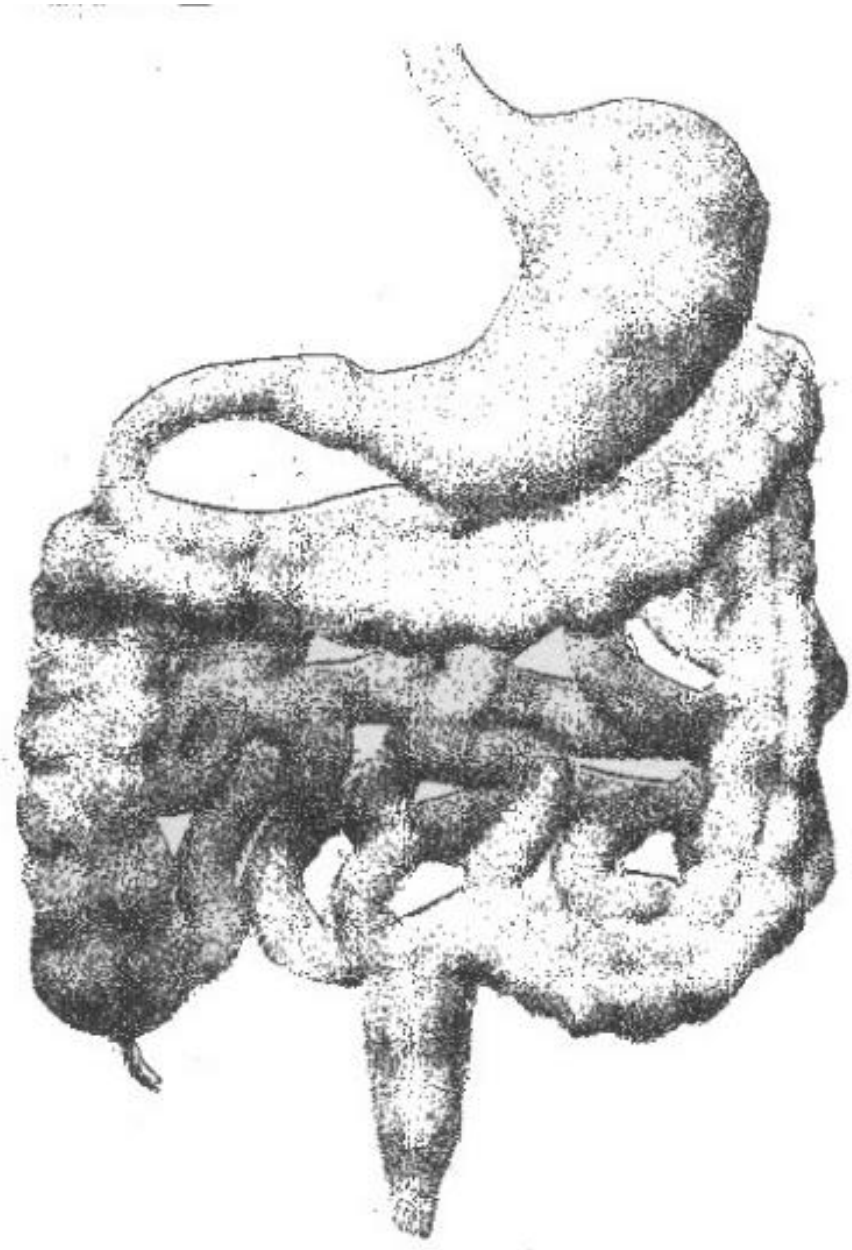
In the ongoing project *Accumulative Care,* I use this anagrammatic approach to constructing a process that can reveal the bodily cost of the digital. The installation is composed of repair maps that I created from individual accounts of people labouring data, from children gaming, data entry tasks, and call centre work, as well as a series of audio relaxation exercises, in which the collective areas of bodily repair can be listened to as one body.

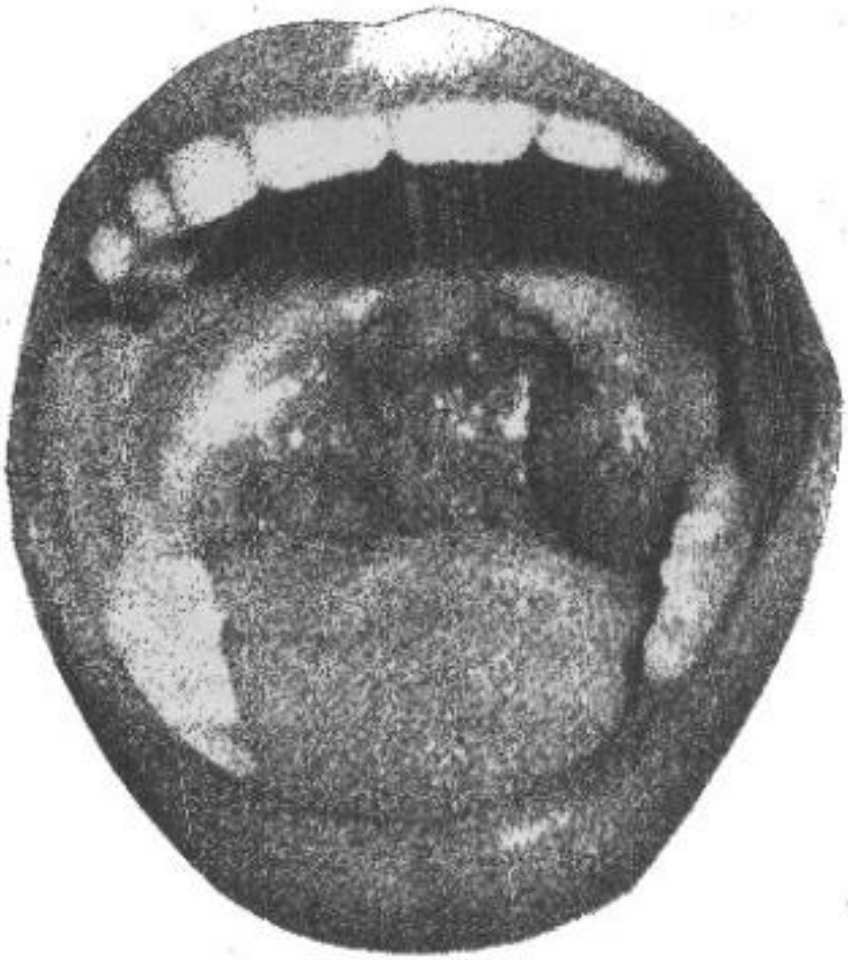
By taking care as a cultural format, the labour attached to the risk associated with the different forms of digital work comes to the fore. The installation invites participants to lie down on the mats in the care installation and to go through the labour of healing using their bodies as a way of engaging with

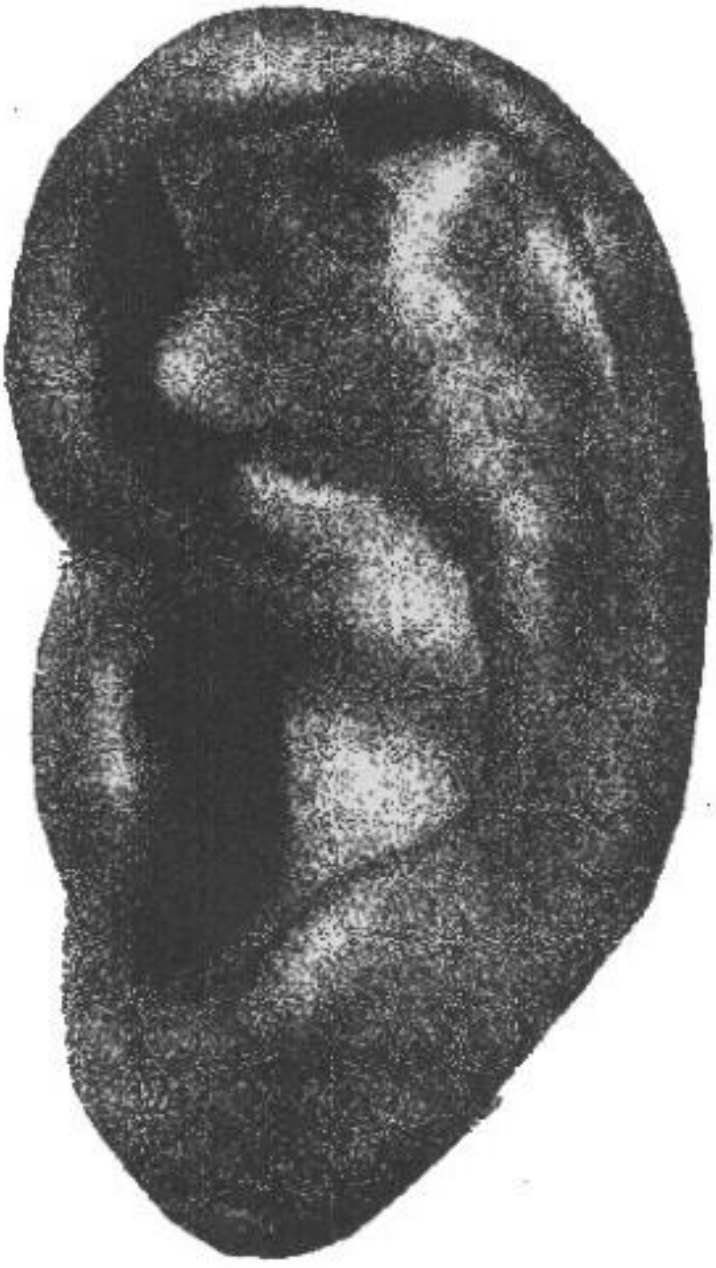
the artwork. As you put on the headphones, you are immediately asked to focus on your body by the healing voice of the healthcare organiser and activist, Toyin Adeyinka, who guides you through your body as it is felt by data workers. The relaxation exercises are created by gathering the body parts named in the individual testimonies of data work, and therefore, the more detailed the repair map is, the longer the relaxation exercise becomes.











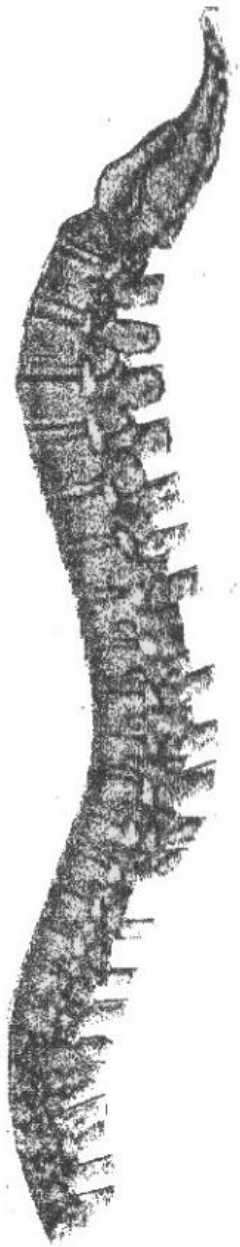


Figure 34. Alexandra Jönsson, *body map elements* (repair). Hand-throat, eye-skin, gut, throat, hand-eye, ear, left hand, right hand, spine. 2018, paper collage.

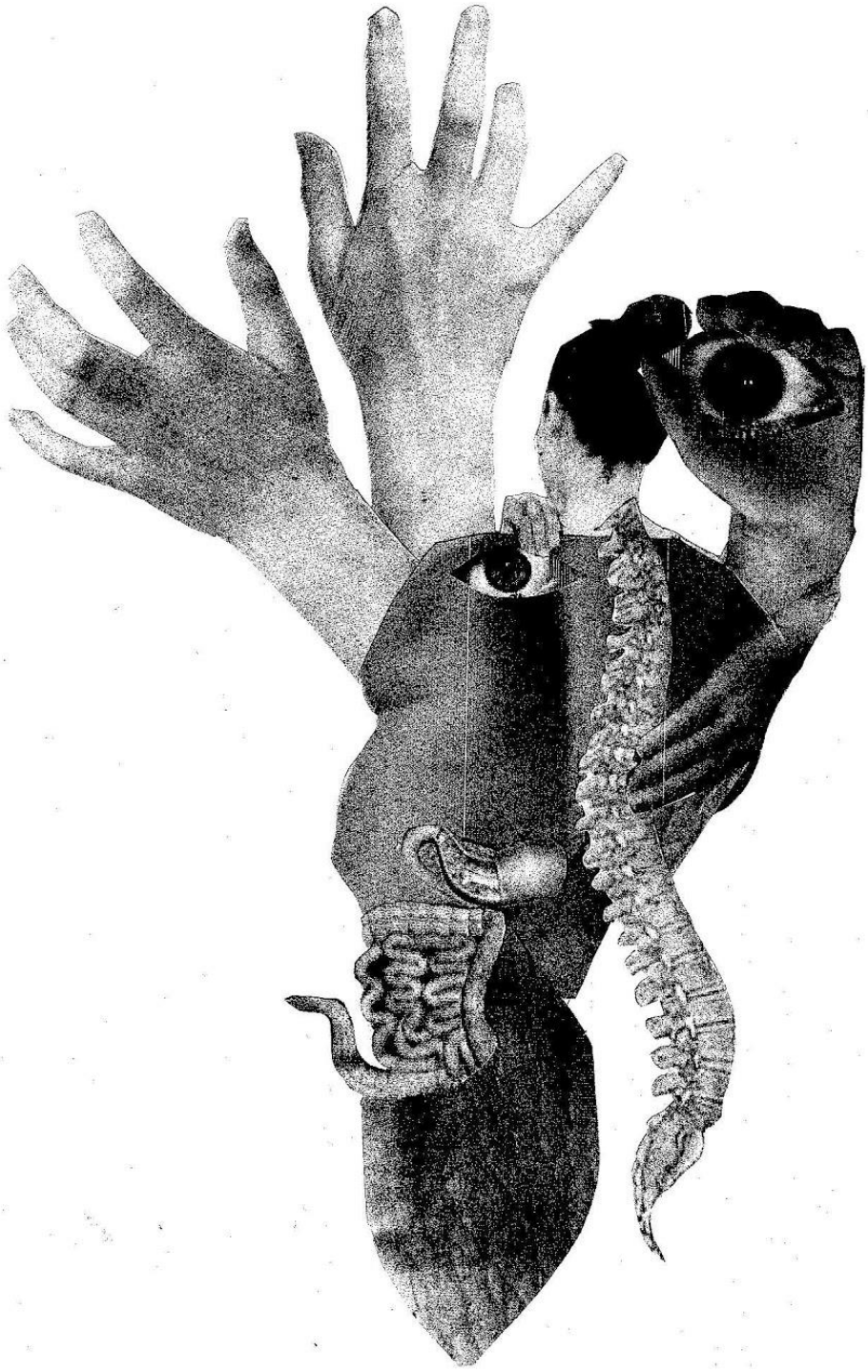


Figure 35. Alexandra Jönsson, *Repair Map* (data entry work), 2018, paper collage.

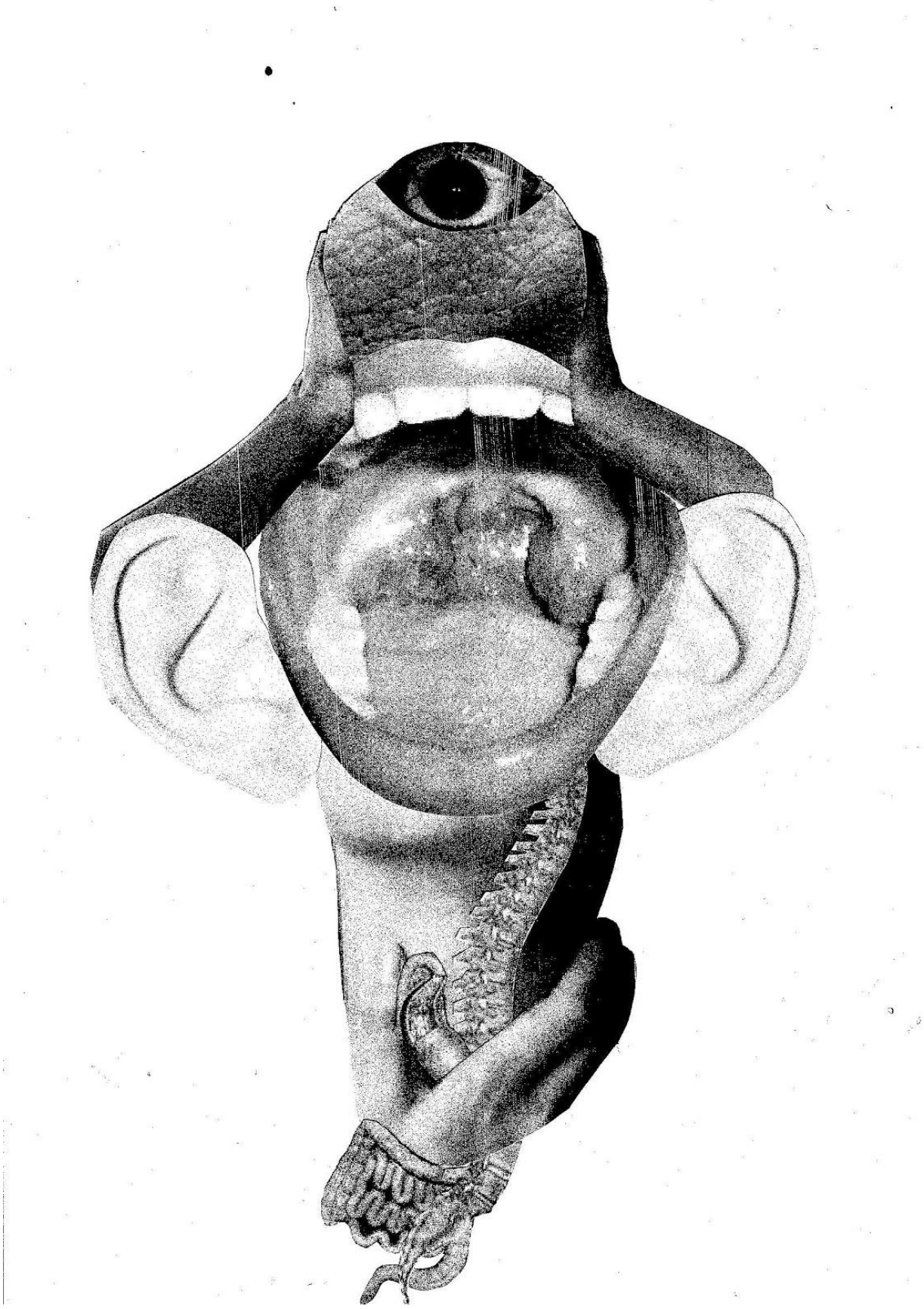
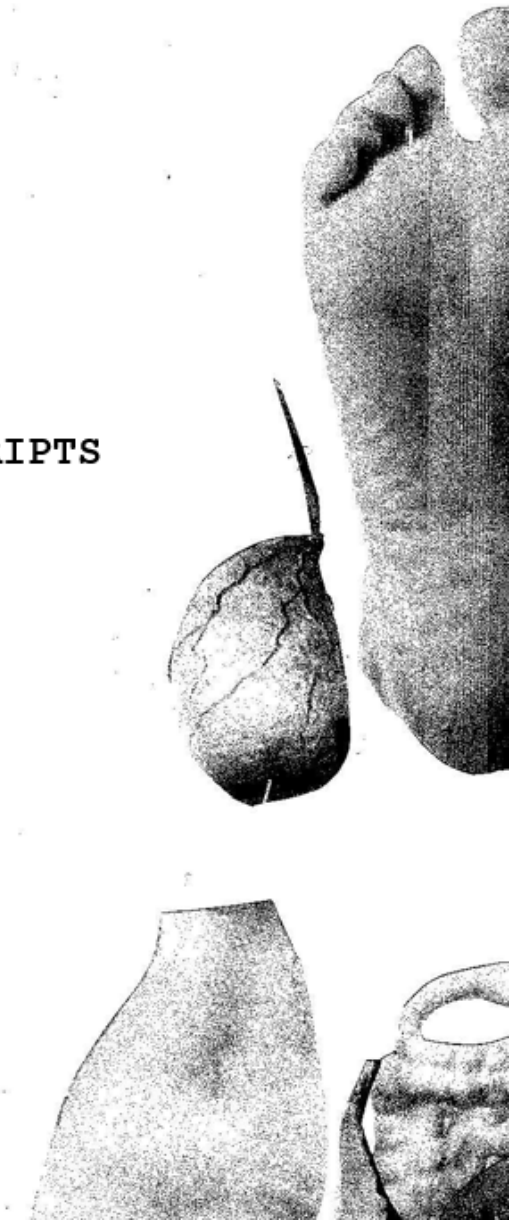


Figure 36. Alexandra Jönsson, *Repair Map* (call centre work), 2018, paper collage.

TOWARDS MAPPING RISK

RELAXATION EXERCISE SCRIPTS

By Alexandra Jønsson



Relaxation Exercises

RELAXATION EXERCISE

Voiceover: Toyin Adeyinka

WHO'S BODY: CHILD PROSUMER

Affected body parts
legs
lungs
belly
gut
nervous system
back
shoulders
hands
index finger
thumb
index finger
neck
ears
eyes
scalp
head

Thank you for joining us.
(Pause)

First: congratulations! You have managed to a rest
Well done for taking this time for yourself
(Pause)

Do you play Roblox, racing games and watch YouTube videos? Do you download lots of new apps on your mum's phone and chat to your friends online? If yes, this relaxations exercise is for you. If you haven't been to the loo because you have been too busy playing games, you better pop there now before we get started.
(Pause)

Now remove your eyes from the screen, ignore any content that might be calling your attention,
(Pause)

let go of the iPad or phone with your hands, step away from the machines.
(Pause)

Take your body to a quiet place where you can sit or lie down.
(Pause)

During this relaxation exercise, we will create some time to acknowledge and notice the how the Ipad or telephone make your body feel. Sometimes we can feel good playing games, and other times it can make us feel bad. Nice things can happen when playing games with your friends, but sometimes it can be difficult and maybe even something scary can happen. We will now go on a journey into the nooks and crannies of your body, and visit some of your muscles, organs, and body parts so we can relax them.
(Pause)

First get comfortable and find a position that feels good to you
(Pause)

That's it - shift your weight a little, make some room for your body, rest comfortably on your bottom, or if you are lying down, rest your body comfortably on the ground.
(Pause)

Now, close your eyes if you wish, or focus your gaze on one spot in front of you.
(LONG Pause)

Direct your attention outward
(Pause)

notice the sounds around you.
(Pause)

Concentrate on all the things you can hear

(Pause)

Let the sounds pass through you without getting caught up in stories or judgements about them.
(Pause)

Feel your body weight resting evenly onto the floor.
(LONG Pause)

Notice your breath
(Pause)
Take a deep breath in
(Pause)
Hold it
(Pause)

And take a long breath out
(Pause)

Take a deep breath in
(Pause)

Hold it for a while
(Pause)

And take a long breath out
(Pause)

Feel the air flowing freely into your body
(Pause)

and feel it flowing out your body
(Pause)

relaxing your muscles so that you can rest calmly...becoming relaxed...
(pause)

You are now ready to go into your body parts.
(pause)

Slowly move your attention to your lower legs
(Pause)

Cramp your leg up as much as you can
(Pause)

Hold it
(Pause)

And then let them relax
(Pause)

Allow yourself to feel the blood flowing freely through your legs
(LONG Pause)

Your legs are becoming heavy and relaxed
(Pause)

Let your attention travel to your belly
(Pause)

See your tummy expanding as you relax your muscles
(LONG Pause)

First move your attention to your bladder under your belly bottom
(Pause)

Allow yourself to see it in its entirety, a strong, flexible and soft pouch
(Pause)

Let your attention travel across the wall of your bladder in a circular movement
(LONG Pause)

Let go of any tensions you might feel
(LONG Pause)

Notice how your bladder is becoming relaxed and light
(Pause)

Move your attention towards your gut
(LONG Pause)

Now notice your gut – follow it as it bends and wiggles as a long worm inside your body
(Pause)

It's very long try see if you can see where its leads you
(LONG Pause)

Notice what it feels like
(LONG Pause)

if its tense
(Pause)

Let go of any emotions as you breathe out
(LONG Pause)

You feel relaxed from the belly region and down
(LONG Pause)

Bring that warm feeling upwards through your spine, feel it spreading across your chest and your arms
(Pause)

You feel it reach you your shoulders and then your neck
(Pause)

Let it relax by feeling the warm sensation massaging you neck in a circular movement
(LONG Pause)

Let go of any tensions
(LONG Pause)

Let the warm feeling spread across your arms on both sides
(Pause)

Let the warm sensation travel to your wrists
(Pause)

Let the tensions in your wrists disappear as you relax them and feel the warm sensation spread into your hands
(Pause)

Clench your hands with all your strengths
(Pause)
Hold it
(Pause)

And then let go
(LONG Pause)

And then relax all ten fingers at the same time
(LONG Pause)

bend your pinkies- and then them relax
(LONG Pause)

bend your index fingers – and then let them relax
(LONG Pause)

Bend your thumbs- and then let them relax
(LONG Pause)

Direct your attention towards the skin of your finger tips
(Pause)

Notice any hardness or tensions in your skin
(Pause)

Feel the skin becoming soft and open
(Pause)

Your fingers, skin and hands are now completely relaxed
(LONG Pause)

Bring the warm relaxed sensation slowly back to your neck
(Pause)

Let it travel across the back of head through your brain and arrive at your scalp
(Pause)

Relax all the little hairs on your head
(Pause)

Feeling your scalp becoming light and relaxed
(LONG Pause)

Now travel to your eye balls
(Pause)

Take a moment to experience the world from the perspective of your eyeballs
(LONG Pause)

Close your eyes as hard as you can wrapping your lids around your eyeballs
(Pause)
Hold it
(Pause)

And relax your eyes
(Pause)
Roll your eyes up
(Pause)

And then let them relax
(LONG Pause)

Direct your attention towards your eye lids
(LONG Pause)

Notice any tensions or vibration
(LONG Pause)

Let you eye lids become heavy and softly closing around your eyeballs
(LONG Pause)

Now your attention towards to your temples on the side of your head
(Pause)

Imagine a warm ball gently touching your temples on each side of your head
(LONG Pause)

Slowly relieving you of any tension you might have
(LONG Pause)

You head feels light and empty
(Pause)

Enjoy that feeling for a moment
(LONG Pause)

Let go of any worries or stories you are holding on to
(LONG pause)

let yourself become empty
(LONG Pause)

You are now totally relaxed
(LONG Pause)

When you are ready – slowly turn your attention outwards
(LONG Pause)

Notice the sounds in the room
(LONG Pause)

Wiggle your toes
(LONG Pause)

Move your body slowly from side to side
(LONG Pause)

Slowly waking you body up
(LONG Pause)

When you are ready, open your eyes, and return to the room and enjoy the rest of your day!

Figure 37. Alexandra Jönsson, *Accumulative Care* (child prosumer), 2018, audio relaxation exercise script.

The installation provides a physical context for considering what care means across differently lived social and geopolitical realities and questions if they should be considered within the same framework. In Fuch's analysis of the political economy of digital labour, he makes an argument for seeing the exploitation of social media users as directly connected with the exploitations of workers on the hardware assembly line, in the mines and on e-waste sites (Fuchs 2014, 147). The precarious conditions of workers in the Global South's industries are directly tied to the technological habits of consumers in the West through the capitalist demand supply chains that operate to reduce the costs of production, and therefore, also labour power (2014, 147). While the connection that Fuchs points to is important to consider in whose favour the models of capitalism function, the agency of the theoretical account must be brought into question. The use of a theoretical superstructure that reproduces the worker in the Global South at the bottom of the hierarchy and tech conglomerates at the top removes both the agency of the theory to resist or intervene into this context, and more importantly, risk erasing the potential for workers to have an active agency when they figure as an object of "knowledge" in the theoretical work. Suggesting that the scale of *socio-economic* precarity itself is an ethically or practically stable category is problematic because it does not allow for this concept to be questioned. If I had designed the relaxation exercises on this principle, they would categorically become longer and intact with the accumulating bodily risks of data workers in the Global South, and the relaxation exercises to heal would become equally as long. This would create

a care structure where boundaries between *care* and torture begin to blur: is it still care if the relaxation exercise takes eight hours to complete? For this reason, it was important for me to consider mapping not as a predetermined relation between bodily risk and precarity. After all, naming the experiences within the body is a practice that can take many different forms depending on the culture it is embedded within.[78]

Figure 38. Alexandra Jönsson, *Accumulative Care*, 2020, audio installation, in: Body Politics of Data, solo show, London Gallery West, 2020. Photo: Jalaikon

[78] The further development of this project would ideally take place within a workplace, for instance in a call centre, where the making of body maps and relaxation exercises could become a practical site of engaging with notions of welfare and bodily risk of data work within the live context of the workplace.

Figure 39. Alexandra Jönsson, *Accumulative Care*, 2020, audio installation, in: Body Politics of Data, solo show, London Gallery West, 2020. Photo: Jalaikon

In the final showcase of the work, I decided to include this process of reflection into the work itself by showing the processes of making the repair maps and the relaxation exercises created from testimonies of workers experiences along with empty body maps and audio relaxation exercises. The empty mats within the line of repair spaces on the floor indicate the process of what is yet *unmapped* or *unmappable* in this format, showing the partial perspective of bodies in movement. In this way, I explore how to bring bodies back into view within the digital while acknowledging the complex territory of power that comes with imagining bodies and relations between bodies within artistic practice.

Concluding Notes: Collective Forms

The work on care refocussed the practice-based experiments from visualising the context of data practices towards exploring conceptual and performative formats within which bodies can be articulated as bodily, technical and social processes. In the installation *Accumulative Care,* I more specifically imagine *caring* as a cultural practice that could offer a new framing of digital embodiment. The dominance of digital narratives that separate the technical product from the people that design, manage, develop, maintain and use it leaves a narrow technical terminology to understand the role that computation plays in contemporary culture. The format of care provides a process to explore how digital ecologies put bodies under pressure in new ways, which brings the underlying labour of recovering from such pressures to the fore. Feminist theories on labour and care give an analytical framework to unpick how new capitalist models of digital work render aspects of digital labour invisible in the same way that care work has traditionally been framed as outside of capitalist

definitions of work. With the rise the gig-economy, the costs of the workspace, such as electricity, furniture and computers, are shifted onto the individuals whose labour is contracted on a strictly timed task basis, such as manual data entry work, online rating and click work or in more opaque forms of online work such as influencing, gaming or prosuming.[79] The increasing demand for digital products equally affects the conditions of workers who produce and assemble the hardware technologies on the assembly line, mining sites and e-waste sites. The framing of digital work around the technical processes of coding, typing or producing content erases the material and social contexts of the work, making the "self-management" of risks a shared experience across different forms of work in the digital economy. The context of labour provides an important counter perspective to how digital embodiment has been theorised, with an emphasis on the bodily nature of information and digital networks (Featherstone 2006b; Hansen 2007), however, how the economic and social circumstances of the digital are experienced within this is lacking from these accounts. To avoid reproducing a concept of digital embodiment as a question of an individualised digital interaction, it was important to conceptualise these experiences as shared rather than enclosed within individual bodies. The care installation addresses the relation between the individual and the collective by bringing the repair maps that mark the individual as being in charge of defining their experiences of data work into the collective format of the audio relaxation exercises in which the experience of workers can be listened to as one body. And through this gesture, as what is normally suggested is that the pressures of the digital are experienced individually, it is shown that it must be resisted collectively.

[79] Prosumption is a mode of production which combines production and consumption understood to frame the production of user-generated content in the digital economy.

CHAPTER 9

DISCUSSION
EMBODYING RISK

> Currently the loudest voices debating the potential dangers of superintelligence are affluent white men, and, perhaps for them, the biggest threat *is* the rise of an artificially intelligent apex predator. But for those who already face marginalization or bias, the threats are here (Crawford 2016).

Crawford's statement points to an important discursive bias in the ways that the risks of digital technologies have been imagined. In the context of surveillance capitalism, the risks have been defined as a pervasive means of behaviour modification in the 21st century (Zuboff 2019) that renders individuals subservient to omnipotent data capturing processes. Databases and data infrastructures have been described as operations that both reflect rationalities, but also reproduce and reinforce such rationalities (Kitchin 2014, 21), as "extraordinary intimate instruments of power" that work to amplify the often biased systems and institutions they are set up to serve (Paglen 2016), and as a form of imperialism that "[…] aims to reinvent virtually every other site of practice in its own image" (Harwood 2019, 31). In this view, the risks are framed in terms of the omnipotence of the financial and technical operations, which renders them beyond the realms of human interventions. This is also reflected in Paglen's sentiment that "there's no obvious way to intervene in machine-machine systems using visual strategies developed from human-human culture" (Paglen 2016). The imagination of the digital as all capturing processes, however, limits the analytical potential for locating these processes socially and materially. Haraway also called this the "God Trick" of the corporate sciences, a mode of knowing everything from a place of nowhere (Haraway 2004, 86).

By drawing on feminist methodologies (D'Ignazio and Klein 2020; Behar 2016; Beetham and Demetriades 2007; Coleman 2008) that present analytical frameworks where lived experience, material sites and practices come to the fore, the risks of digital technologies can be located and imagined within the social and material contexts of everyday life. In the chapter *MOVEMENT,* I discuss how the body mapping experiments, *Life Drawing the Attention Theft* and *Cleaning and Scrolling*,

show how the processes of corporate media are levelled through daily media habits. The imposition of surveillance capitalism, as defined by Zuboff, is understood in direct relation to daily routines in which commercially oriented media objects and processes become co-constructing of how everyday movements and postures are choreographed. The framing of corporate risk must therefore take into consideration the social body as a physical site in process and movement.

However, the computability of data puts the body in a new geographical, financial and administrative frame. In the chapter on *Capture*, I explore how data producing infrastructures within the context of maternity services enable the pregnant body to be represented within local contexts of care as well as in national databases. As the body is appropriated within the movements of data, it expands beyond its material site. The project *The National Catalogue of Savings Opportunities* addresses how the body is conceptualised as a site of financial interest through its data capture. By mapping the operations of the NHS Digital range of "intelligent tools," such as cost optimisation measures, the project shows that the bodies and behaviours of pregnant women are articulated as areas of financial risk. The opaque processes through which healthcare data is represented and modelled impose a new set of uncertainties and risks for the individual who gives their data for the purpose of care because, ultimately, there is no way of knowing how such data will come back to haunt them: for example, in cost-optimisation initiatives that vilify women's bodies or as a hospital bill in the post. Therefore, the risks of how bodies are imagined and governed with computational technologies should not be seen only in terms of the abstract processes of computation but also in relation to the impact such processes create for individuals who are left to manage the uncertainties of how their data could unlock unwanted actions within the wider governance system. Whether it is the unlocking of perfect care, a referral to social services, dealings with the billings department or the border agency, the risks of data are very much lived and embodied. In my research I argue that it is only by

looking at the data practices within the context of how they are used, produced and managed that the risks can be located and addressed. Equally, the process of working with the production of maternity data reveals that much of healthcare bureaucracy is manually laboured through medical appointments, physical examinations, conversations and data entry, which has an impact on how the production of data can be framed as a process that moves between digital infrastructures and different forms of labour.

Computational narratives of reproductive bodies are equally produced on corporate social media platforms such as Twitter. In the project *Data Collage,* I explore how the meanings of pregnancy and family-making are connected to the aesthetics of porn and celebrity culture. The project acts as a practical framework for considering debates on computational visual cultures in which the concept of a human body is increasingly uncertain. Some argue that the relation between the viewer and the image is irrelevant in the context of surveillance capitalism because, rather than serving individual users, the content they produce is appropriated as building blocks in the making of predatory algorithmic products (Paglen 2016). Others argue that, while digital technologies have displaced *vision* as a primary sense (Featherstone 2006b, 235), the users' interactions are increasingly becoming bodily with the rise of *physiological* and often *non-conscious* forms of media habits (Massumi 1995; 2002) and with"[…] the reaction of the embodied human user or, more bluntly, the constraint of human embodiment that gives form to information" (Hansen 2001, 83). Featherstone develops the concept of the *body without an image* to examine the role of the *felt* body in consumer cultures that are increasingly taking digital form. He draws on Massumi's *movement vision,* in which the body is neither seen as an object moderated by the subject nor perceived photographically but is itself central to the *forging* of the digital image. This process, he argues, functions affectively (2006, 234), as he writes:

> Important here is proprioception—not tactile or visceral sensibility, but the which relates to muscles and ligaments, which register conditions of movement and translate the body's encounters with objects into a muscular memory of relationality, a cumulative memory of skill, habit and posture (2006, 234).

This concept of affect partly explains how the creating and sharing of digital images are coded into the body as process, becoming co-constructing of the bodies that they record. By considering data from this perspective of practice, the risks of the digital must be understood in terms of the bodies' ongoing visible, and sometimes invisible, relations with data infrastructures rather than positioning the social media user as a passive source of data. My understanding of how to conceptualise the risks of the digital in my practice based research is informed by the work of feminist practitioners and writers such as Behar and Steyerl who have more concretely conceptualised the risks of big data in terms of the material accumulation of new toxic ecologies instead of through its technical superiority. The focus on how material sites of waste, such as plastic, e-waste, technical detritus and digital rot, pushes questions of risk beyond anthropocentric temporalities, however, the occupational health of workers who maintain and clean waste sites must also be thought of as inclusive to the scope of such temporalities.

In the chapters *Labour* and *Care,* I focus more closely on conceptualising the appropriation of the labour ecology as a cheap or free raw resource within the context of surveillance capitalism. Featherstone writes that the reason that we have to examine digital embodiment is because we will *use* it more: "[..] in a global context in which more people will invariably rely on and use new media, not just as a mode of entertainment, but in the context of their education, work and generation of their means of orientation" (2006, 235). However, when looking at the material sites of data, it becomes clear that using the concept of user-interaction as a basis for thinking affective bodies

cannot fully account for the various lived social and material realities of digital workers. The intersectional body politics of different forms of secure and insecure work, such as manufacturing, mining, content moderations and online work, cannot be accounted for by employing the "user" as a template of the body because it frames it in terms of its consumer power, and therefore, a body in "charge." In the same way that the history of the human-computer relation provides a view of how women worked as computational machines, contemporary big data factory workers equally present an embodied view of being a *part* of the machinery rather than in charge of it. While the workforce associated with data is commonly understood as male, higher-educated programmers, engineers and increasingly designers, gamers and digital influencers a host of other professions, including unpaid prosumption, menial data jobs, online work, tech manufacturing and metal mining, are often left out of the discourse altogether. Fuchs focusses on the political economy behind social media and points to how capitalist forms of labour exploitation are connected through global demand-supply chains that are politically structured to be the most exploitative in the context of the Global South; however, he gives little attention to how these realities are lived. Feminist accounts of labour allows us to see how capitalist definitions of work put workers at risk in the way that immaterial forms of labour go uncounted (Barbagallo and Federici 2012). Marketed as *playbour*, type for hire, precarious contract-based work or even as prosumption, in which the cost of the workplace, utilities, tools and occupational risks are framed as the workers' responsibility, an increasing amount of data work is defined as a free labour resource.

I argue that these bodily, financial and political circumstances must be thought of as inclusive to the analysis of how bodies materialise within socially and materially lived contexts that come to define how computation is experienced. In the work of Ahmed, the body is contextualised more directly in terms of racist and misogynist affective economies (Ahmed 2004b; 2014). In the work of Rai, in the

practices of *jugaad* in contemporary mobile phone ecologies in India, the production of affective labour is positioned as socially and culturally situated but never fully captured by capitalist ecologies (Rai 2019; 2015). Rai shows the potential of how affective modes of analysis harbor a potentiality for change, and thereby, pointing to the agency for resistance in everyday life. He writes:

> Thus, returning to the political stakes of such an analysis, there is an important difference not just in material conditions but in value itself between the jugaad practices of ordinary Indians, which beyond just a way of fixing things is quite directly tied to the persistent effects of (post) colonial struggles against hierarchy, authority and deployed power (2015, 998).

As opposed to reinforcing omnipotent theoretical concepts of digital technologies that erase opportunities for locating the risks of the digital in everyday life, Rai explore the potential of the analytical framework affirmatively by investing it into the continued imagination of emerging forms of resistance. In the last part of the thesis *Care,* I draw on such affirmative approaches to propose a *practice* of care for the digital age. The risks of the digital, often omitted by neoliberal forms of digital work, are in this project expressed and identified as they are felt by bodies and re-rendered as material sites of bodily repair. By articulating bodies through the language of repair, the social and bodily costs of labour and self-reproduction come to the fore through an account that is not predetermined but in process.

CHAPTER 10

CONCLUSION

When I had my baby, the return of my data in social media advertisements, search engine predictions and hospital bills in the post was always more marked by fleeting moments of worry and bodily uneasiness than conscious thought. The recirculation of experiences, moments and actions triggered by computations of my data was, for the most part, webbed into the rhythms and fabrics of everyday life. That was, until I put the image of myself sleeping *Untitled* (portrait of sleeping parent, 2014) through the Google Vision image recognition programme. Suddenly, I saw how my body had been transplanted from the safe space of my bedroom where my son was impatiently playing with the phone camera in an attempt to wake me up, into the distant location of the Google server farm. My body was instantly at the mercy of capitalist algorithms, wilfully gazing back at my sleeping body as a piece of porn. The research examines how the extraction of experiences and actions in data require a new perspective on the social and bodily contexts that are adapted as sites of computation, and new relations that emerge from such sites.

In the *Contextual Review,* I examine the ways that artists have imaged data and its operation within the context of art and technology. I point to how some of the existing methodologies, framed around technical experimentation and novelty, are limiting in terms of exploring the social and bodily realities of data. Across the four chapters *Movement, Capture, Labour* and *Care,* I discuss the artistic projects and how they address the research questions.

4. How can feminist methodologies of lived experience, care and maintenance shift the focus of artistic practice in the field of art and technology from technical and economic definitions of big data to an ecological view of data as being socially and materially embodied?
5. How do concepts such as the *labouring body* allow for a new situated understanding of what counts as a body in the context of computational culture, as it allows for a focus on *becoming* across human and non-human materialities?

6. Framing data as a social and bodily concern, how can the artistic practice become investigative of the potential risks of processes of digitalisation?

1. Data as Practice

In the *Conceptual Framework,* I contextualise my own research with feminist work on performance art, labour aesthetics, and Object Oriented Feminism to explore an embodied view of extractive data practices. By positioning data *ecologically,* it can be examined in relation to its administrative, political and material sites, which provides a set of contexts for the artistic practice to examine and intervene. In terms of reconnecting the production of data, conceptually speaking, back to its bodies, the framework of affective *becoming* bodies allows for the political and material organisation of the data ecology to be considered in direct relation to its subjects. Following feminist methodologies, I set out to explore how the digital can be appropriated as a site of experience rather than representation within artistic practice.

In the chapter *Capture,* I discuss a series of collaborative experiments that take the lived environment of maternity data as a research site. The projects examine how body data in maternity healthcare is constructed through a series of practical, technical, and social processes that extend the body into administrative databases. By integrating my own lived experiences of being neonatally data producing, as well reflecting on the perspective of midwives, consultants, and healthcare commissioners, I was able to adopt a view of data in the artistic practice that takes into account how it is made and used. The experiments *Welcome to the Maternity Ward, The Allocation of Reproductive Responsibilities* and *Top Ten*, show how data collection is defined by heterosexual and medical ideologies that often operate in the background and yet materialise in the way that bodies and their experiences are digitalised. For instance, the drawing *Allocation of Reproductive Responsibilities* shows that the pregnant body is constructed as biologically female and heterosexual within the

maternal record, and the same record equally frames reproductive care by including migration data and residency data. This reveals that the processes of how people's bodies and information are webbed into computational processes that classify them are not neutral. However, they are often only experienced directly by people who fail to provide such data. How data infrastructures reproduce themselves by allowing certain bodies to *become* real while rejecting others, point to the body politics of such data as regulatory and, at the same time, accumulative. The project *The National Catalogue of Savings Opportunities* focusses on the ways that maternity data is appropriated in new predictive products, such as cost-optimisation measures to adjust cost spending across the maternity sector, which produces a way of governing reproductive bodies by framing the behaviours and body parts of reproductive bodies as sites of cost-savings. These processes reveal that the discursive dichotomies of object/subject, culture/nature and technology/body are untenable in practice because the way that extractive data operates is already bodily.

Mapping

In the maternity projects, the mapping serves to identity the infrastructures and *grey media* machines (Fuller and Goffey 2012) that operate in the background, yet structure their social and practical environments. Importantly, this process allows digital risks to be identified within the social and material reality of maternity. Mapping the body in relation to such processes helped navigate how data positions bodies as in or outside of data, presenting different risks that individuals must navigate. For example, the way that reproduction is conceptualised as biologically female and heterosexual presents risks for queer same sex families expecting babies because their bodies cannot be represented within the healthcare database. The way that data is produced socially can put migrants and people without recourse to public funds at risk because lacking identity data, paperwork or

entering the “wrong” data can trigger a referral to an overseas officer or the UK border agency. Equally, the risks of “no data” can be seen in relation to recent research showing that the race bias within maternity is the cause of BAME women being five times more likely to die in childbirth (Knight et al. 2018). The mapping methodology allows for a conceptual overview of how the body politics of data can be understood in terms of what comes to count as a body. The extractive processes, through which the body’s processes and experiences are appropriated for profit, care planning or regulation, can work in the favour or against individuals but, importantly, a body politics of data must also be understood in relation to the bodies that are uncounted.

2. Labouring Bodies

With the rise of off-the-shelf software and corporate services within the NHS, like its recent partnership with Amazon to deliver health advice using their AI (Walker 2019; Siddique 2019), it is relevant to consider how commercial interests increasingly occupy public services.

In the chapters *Movement, Labour,* and *Care,* I explore how performative methodologies of care and maintenance can provide a setting for contextualising body politics beyond the experiences of the administrative data and the consuming subject. By taking the histories of human computers as a starting point to think about bodies that labour data as politically structured by the capitalist economy, the monopoly of the consuming subject often figures latently in theories of digital embodiment, which can be challenged. This allows me to return to Hayle’s question; "how much had to be erased to arrive at such abstractions as bodiless information?" (1999, p. 12) and to change it to *how many bodies* have been erased to arrive at such abstractions?

The project *Data Collage* worked as a practical frame to think through the implications of the concept of labouring bodies for art and technology practices. Working specifically through user generated content on pregnancy from a Twitter data capture, it became clear that visualising the computational properties of the image archive was not going to produce a critical account of the capitalist framing of reproductive bodies as porn, and instead, it would merely amplify it. However, by considering the labour ecologies that sustain the online production of data, including cam sex workers, bots, influencers and commercial content moderators, such content can be defined in relation to its workers rather than its commercial usages. The social and material framing of data brings to the fore how data is produced by an ecology of workers often excluded from the definitions of the digital. In the projects *Life Drawing the Attention Theft* and *Cleaning and Scrolling,* I conceptualise the labouring movements of the prosuming body as connected to the economic movements of data. In the projects *Repair Maps* and *Accumulative Care,* I more specifically examine the embodiment of different forms of data work. I explore how to create a shared way to contextualise the various modes of labour exploitation within digital ecologies to see the experiences of digital users, influencers and data entry workers as directly related to workers who mine metal, assemble hardware and work with machines to moderate, clean and edit online platforms (Fuchs 2014). By challenging the framing of the artistic practice around the actions of the consuming subject, the political organising of extractive labour must be thought of as inclusive to how data is embodied.

Performative Strategies

The projects *Repair Maps* and *Accumulative Care* further develop the use of performative strategies to explore how digital labour moves the body as site. For the mapping of the body in maternity, as well as the experiments *Life Drawing the Attention Theft, Hardware Specific Pain* and *General Digital Pain,* I use life drawing methodologies to examine how the movement of bodies is tied to the

movement of data. However, the full frontal nude is not in movement. For this reason, I found it limiting in terms of the lived experiences of data work because this view is never embodied. In the *Data Collage* project, I explore integrating performative data labouring actions through collage processes of cutting, editing, and recomposing image material as a process through which the body itself emerges. As opposed to being at the mercy of the artist's vision as a passive viewer in front of a screen, the role of the participant in the *Data Collage* workshop is implicated and co-producing of the work. The strategy of collectivising the power to define what counts as a body within the digital is further developed in the mapping of workers' bodily experiences in terms of repair. Defined by experiencing bodies, the *Repair Maps* are the process for creating a practice of care that addresses the materiality of occupational health hazards from the effects of data work. Rather than view the consuming subject, the repair maps document the position of working *within* processes of scales, speeds and rhythms of computation, rendering visible the social isolation and precarity of data entry work, the emotional risks of content moderation, the challenge of influencers to stay connected with thousands of users at once as well as the risks of working in metal mines and in e-waste recycling sites. The concept of the labouring body presents a new context for articulating how data is embodied as a hardware-specific pain, software induced anxieties and financial forms of exhaustion.

The historical, material, and social context of bodies are often lacking in how they are imagined within art and technology practice. The digital interaction performance *Apparition* by Obermaier shows a body that is seamlessly interacting with electronically generated visual projections on stage; in the *BodyQuake* performance by AOS, the body of the naked female performer is the projection site for epilepsy data; and in the work of Trenda, the body is imagined as the carrier of QR codes. In these views, the body is constructed as a passive, unmarked site that can be directly comprehended and captured. Even in projects such as *The Butcher's Son* by Klingeman's or Belmer's dolls, in which the

artists have not been visually obedient to the traditional Western imagination of what counts as a body, the realities of the bodies that the works are modelled on have no agency in within the artwork. For an instance, the realities of people and machines labouring the porn that Klingeman used in his AI work, or Belmer's wife who modelled for him and served as a source of his imagination, have little agency in the way that they have been used within the artworks. When data is imagined within artistic practice with a clear conceptual process accounting for the lived realities of data, are we left with bodies merely functioning as visual utilities of the male gaze? Engaging the performative strategies of feminist practitioners such as Ukeles, ORLAN or Rosler to unfold the imagination of bodies beyond the male capitalist gaze, points to how the relationship between technology and body can be recontextualized through practice. The *Accumulative Care* installation allows individuals to identify adverse body-specific technical processes and suggests collectivising the processes of recovering and resisting extractive technologies. This frames the body within the terms of reproduction, albeit as a broader notion for self-reproducing movements (Barbagallo and Federici 2012). As a form of counter-counting the digital costs from the site of bodies, the last part of the artistic practices frames the social and bodily risks of the digital in their material and economic context.

3. The Social as a Feminist Concern

This brings me to the last question on how the research contributes new models of practice to the existing body of artistic work engaged with framing data as a social concern. The research builds on artistic practices that takes institutional bureaucracy and public databases as the site of art making, such as APG and YoHa, who position workers, the general public and participants as their co-examining audiences. These practices model a socially engaged approach to critically examine technical domination from material and the social positions. My research contributes with

perspectives and approaches that affirm that such social contexts must be understood through intersectional concerns that show, for example, how infrastructures and technical processes in maternity are gendered in the way they frame reproductive bodies according to the ideologies of sex, gender, age and race. The research positions big data technologies, not as machines that operate "on" the social, but instead as processes that function "through" the social and bodily textures of gendered life, making up new ways that the needs and experiences of bodies can be expressed and regulated. This allows for a format of public practice that is attentive to how routines, processes and practices of data shape the ways in which bodies are validated, rejected or erased. In the maternity project *The National Catalogue of Savings Opportunities,* for example, I explore how the artistic work can repair the connection between bodies and their data by connecting people with how their data is used. The gesture of the artistic practice here is not only to show how the body is appropriated by institutional or corporate interests but also to experiment with ways to intervene into these processes, by helping to piece back bodies to their data. This brings us to how the research bridges a gap between how the risks of the digital have been imagined and how they are practically experienced. The tales of imminent *apex predators* (Crawford 2016) and the blind belief in the technical utility of *Big Dick Data* (C. D'Ignazio and Klein 2020) mean that the need for contextualising the threats of the digital within everyday contexts has never been greater. While work on surveillance capitalism shows how data technologies fuel the conglomeration of powerful institutions and corporations, risks are often defined in terms of ever-expanding machine to machine data operations (Paglen 2016) or pervasive, yet abstract, means of behaviour modification (Zuboff 2019). However, in practice, these narratives are limiting in terms of identifying how, when and where in everyday life these risks materialise. In practice, how the digital is imagined comes to matter in how that imagination stifles or enables potentials to dodge or resist digital operations that seek to dominate

and exploit, as shown by these authors. However, the potential of the body of practice developed here is its orientation towards an affirmative and reconstructive critical practice, one that looks at how performative strategies hold the potential to reinscribe body and mental processes into the way that computational operations are imagined and analysed. This expands both the field in which artistic practice can operate and the conceptual outlook for examining the body specific risks that come with computational culture.

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LIST OF PRACTICE-BASED WORK

1. METHODOLOGY

1.1 Workshops

Jønsson, Alexandra, Cliff Hammett, in collaboration with Autonomous Tech Fetish," Make and Do workshop series ", flyer, 2014-2018

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Queering Computing", public workshop, The Common House, London, 6th July 2014.

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, Open System Association, "Bodily Bureaucracies", public workshop, The Common House, London, 13th December 2014.

Jønsson, Alexandra, "Mapping game", drawing, 2014.

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Body Capture", public workshop, The Common House, London, 9th July 2015.

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Data Buffet: All You Can Input ", exhibition event, Exeter Library, Exeter, 20-21st May 2016. http://www.moccguide.net/data-buffet-all-you-can-input/

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Cuppa Data ", tea collection, 2016.

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Wearable Cow Aggregate", wearable sculptures, 2016.

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Betty Ciphers Algorithmic Recipe Generator", video, 2016. https://vimeo.com/350470358

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Betty Ciphers Algorithmic Recipe Generator", installation, 2016.

Jønsson, Alexandra, Cliff Hammett, collaboration with Autonomous Tech Fetish, "Data Cookery Class", workshop, Exeter Library, Exeter, 20th May 2016.

2. MOVEMENT

2.1 Data Movements

Jønsson, Alexandra, “Labouring lines”, drawing, pen on paper, 2018.

Jønsson, Alexandra, “Cleaning and scrolling”, drawing, pen on paper, 2019.

2.2. Data Postures

Jønsson, Alexandra, “raw resource posture collection”, drawing series 1-18, pen on paper, 2018.

Jønsson, Alexandra, “life drawing the attention theft”, public life drawing class, Deptford Cinema, London, 9th July 2019.

3. Appendix : CAPTURE

3.1 Experiments

Jønsson, Alexandra, “Allocation of Reproductive Responsibilities”, drawing of maternity database, 2017.

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Welcome to the maternity ward”, graphic fiction, 2017.

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Nappy Printing & Healthcare Cutting”, public potato printing workshop, The Common House, London, 6th May 2017.

Jønsson, Alexandra, “Top Ten”, potato prints on cloth, 2017.

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Data Coat”, public intervention, Annual International Conference, The National Geographical Society, London, 01st September 2017.

3.2 Projects

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “The National Catalogue of Savings Opportunities: Maternity (London)”, printed artwork, 106 pages, 2017.

4. LABOUR

4.1.Experiments

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Collaging Big Dick Data”, experiment, 2017.

Jønsson, Alexandra “Data Collage Experiments”, collage, 2017.

Jønsson, Alexandra “#securelogin”, collage, 2017.

Jønsson, Alexandra “#doinmyheadin”, collage, 2017.

Jønsson, Alexandra “maternal connection”, collage, 2017.

Jønsson, Alexandra “feeding advice”, collage, 2017.

Jønsson, Alexandra “freshly clicked”, collage, 2017.

Jønsson, Alexandra “National Security Monitored Device”, collage, 2017.

Jønsson, Alexandra “Server birth”, collage, 2017.

Jønsson, Alexandra “text and pump”, collage, 2017.

Jønsson, Alexandra “text and pump”, gif, 2017.

Jønsson, Alexandra “prosumption”, collage, 2017.

4.2 Projects

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Diagnostics”, stop motion animation, made from Korean Twitter, 7.39 min, 2017. https://vimeo.com/243318223 (password: Kamsamida2017)

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Diagnostics”, stop motion animation, made from English Twitter, 7.39 min, 2017.

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “#expecting #care #cards”, postcard collection, Lewisham Maternity Ward, London, 2018.

4.3 Workshops

Jønsson, Alexandra (The Body Recovery), “Data Collaging”, gif series of collage process, 2018.

Jønsson, Alexandra (The Body Recovery), “The Big Data Cut-up”, public data collage workshop, Fab Fest, Ampika 3, Westminster University, London, 2018.

Jønsson, Alexandra (The Body Recovery), “Make Your Own Queer Family Sticker Pack”, public data collage workshop, Oxytocin; Mothering the World Conference, Kings College, London, 9thy March 2019.

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Make Your Own Throwback Sticker Pack”, public collage workshop, Late Tate, Tate Modern, London, 03rd May 2019.

5. CARE

5.1 Repair

Jønsson, Alexandra and Loes Bogers (The Body Recovery), “Twitter ailments” poster, Neotopia: Data & Humanity exhibition, Arts Centre Nabi, Seoul (SKR), 02nd November 2017 -02nd January 2018.

Jønsson, Alexandra, “Mapping Risk 01 (general digital pain)“, drawing, pen on paper, 2017.

Jønsson, Alexandra, “Mapping Risk 02 (mouse and keyboard pain)“, drawing, pen on paper, 2017.

Jønsson, Alexandra, “Mapping Risk 03 (social media pain)“, drawing, pen on paper, 2017.

Jønsson, Alexandra, “Repair Map (data entry worker)”, collage, 2018.

Jønsson, Alexandra, “Repair Map (call centre worker)”, collage, 2018.

5.2 Accumulative care

Jønsson, Alexandra and Loes Bogers (The Body Recovery), with Toyin Adeyinka (voiceover), “Root/Tangle/Relief/That’s it/Well done”, relaxation exercise, Neotopia: Data & Humanity exhibition, Arts Centre Nabi, Seoul (SKR), 02nd November 2017 -02nd January 2018.

Jønsson, Alexandra (The Body Recovery), with Toyin Adeyinka (voiceover), “A Whisk in Your Head”, version 1, relaxation exercise for midwives, Midwife Wellbeing Day, Lewisham Maternity Ward, 05th December 2018. https://thebodyrecoveryunit.wordpress.com/2017/12/06/collaboration-lewisham-maternity/

Jønsson, Alexandra, Loes Bogers (The Body Recovery), with Toyin Adeyinka (voiceover), “A Whisk in Your Head”, version 2, relaxation exercise for midwives, Midwife Wellbeing Day, Lewisham Maternity Ward, 09th May 2019.

Jønsson, Alexandra with Toyin Adeyinka (voiceover), “Relaxation exercise 02 (call center worker)”, relaxation exercise, 2019.

Jønsson, Alexandra with Toyin Adeyinka (voiceover), “Relaxation exercise 02 (data entry worker)”, relaxation exercise, 2019.

Jønsson, Alexandra with Toyin Adeyinka (voiceover), “Relaxation exercise 02 (child prosumer)”, relaxation exercise, 2019.