

Youth, Technologies and Becomings. Rethinking Digital Literacies Through Relational Ontologies

**by
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Abstract

In Canada, digital media has become an integral part of young individuals' daily lives. Their well-being, social participation, and future prospects are entwined with their ability to navigate the ever-evolving digital landscape. However, recent scandals such as Cambridge Analytica (2016) or evidence of TikTok surveillance (2022) underscore that digital tools are not neutral and can exert profound impacts on society, politics, and learning processes. To address these concerns, educational policies aimed at youth have developed digital literacy frameworks that delineate the essential skills necessary for young people to thrive in this digital milieu. Nonetheless, the conventional one-size-fits-all approach to many of these efforts fails to consider the rich tapestry of practices that young individuals engage in, shaped by diverse social and cultural practices. Moreover, this approach neglects the intricate and often obscured dynamics through which technology companies capitalize on social media use. Relying on the seminal works of Simondon (1958, 2007) on the interplay between individuals and technical objects within processes, this dissertation explores these complexities through a relational ontology (Barad, 2003) that considers technologies as more-than-human actors. This research is guided by these questions: How might we understand relationships between young individuals and technical objects in terms of digital literacies? Can a relational ontology offer a novel approach to digital literacies? Rooted in a multidisciplinary theoretical framework, this research investigates the experiences of 40 young individuals in British Columbia through 23 in-depth interviews and ethnographic observations. Using walkthrough methods (Light & al., 2018) to establish the co-agency of digital objects, the study delves into the multifaceted dimensions of human relations with digital objects, encompassing personal, collective, cultural, and political aspects. The findings are presented as thresholds (Jackson & Mazzei, 2013), where theoretical frameworks and lived experiences converge, offering insightful narratives in the form of five vignettes. These vignettes illustrate the far-reaching implications of design, datafication, and algorithmic processes on digital literacies. In conclusion, this dissertation presents a manifesto for researchers and educators, emphasizing the recognition of diverse and sometimes divergent processes at play when engaging with digital objects. It underscores the importance of acknowledging these complexities to mitigate potential discrimination in digital landscapes and to consider digital literacies differently.

Keywords: digital literacy; relational ontology; individuation; sociogenic principle;
youth

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Chapter 1. Introduction

Amy is a 21-year-old student in physiology at a university in British Columbia, Canada. At the time of the recorded interview we had together, she was conducting an internship in a veterinary laboratory as part of her studies. We met as volunteers in a non-profit organization, which was one of the two community settings in which I conducted this ethnographic study. This program welcomed young people, recently arrived in Canada, in helping them to explore Canadian life and culture through workshops and physical activities. I noticed Amy was often using her mobile phone, even during physical activities. During the recorded interview we had together online at the end of 2020, I asked her what a typical day with digital technologies would look like. Amy answered:

Every day I wake up and the first thing I do is to stop my alarm [on my phone] and listen to podcasts like the news for the day. It helps me catch up on the news every morning [...] On my way to work, I would listen to podcasts and [...] if I don't listen to podcasts, I feel like I'm wasting [my] time on the Skytrain and it just feels so boring. So, I really need to make sure I charged my headphones, I charged my phone so when I am on the Skytrain I can listen to something that keeps me like entertained. (Amy)

When she arrives at the veterinarian laboratory or for her extra-curricular activities:

Technology is a big part like, we need to do presentations; we need technologies for lab meetings and everything. That's also a really important part of my life and of course, like for my extracurriculars I need technology to have meetings with my peers, especially now that everything is online. Before things were online, we would still send meeting minutes and everything on Facebook or whatever so that's still really important and I don't think there is a single club that doesn't have a Facebook chat [...] My hobby is to draw on the iPad [...] I think technology is pretty much integral in my life [...] I don't use like a clock, I use my phone at work so if I'm doing an experiment and I wanted to run for five minutes, then I use my phone timer. So, I use it for everything in my life. (Amy)

At the university, Amy uses an iPad to take notes. She explains that digital technologies have helped her become more efficient at notetaking.

I used to take notes on paper, but I was wasting so much paper and it's so heavy that I just bought an app called Notability on the iPad and I take all my notes on there and it syncs to Google Drive, so I never have to worry

about losing my notes. I take all my notes on my iPad so if I were at school, I would use my iPad every day to take notes and to study. [...] All I need is my Apple pencil and they have like a highlighter, they have a pencil, they have different colors, they have erasers, and they have a voice recording too on the iPad so I can record my lecture. It's really easy and I just get used to the interface of the app like if I were to take notes on paper then "oh! I have to grab an eraser, or I have to grab a highlighter [...]" I can take it with me everywhere and you know no matter how much notes I have, I don't get extra weight in my backpack from the paper. So that's why I prefer the iPad. (Amy)

These interview excerpts show how Amy's activities are pervaded by digital devices. She defines her relationship with these technologies as "pretty integral in her life" and says they support every dimension of her life, including information, entertainment, taking notes, and communicating with her colleagues, family, or peers. Additionally, this relationship informs her emotions and affectivities such as the fear of boredom that Amy expresses if her phone dies because she has not sufficiently charged the battery.

As with Amy, digital technologies permeate the daily lives of most young people. In this thesis, I explore this deeply entangled relationship and what emerges from it, in terms of digital theories and pedagogies. Indeed, as Donna Haraway (1985) explains when she develops her notion of the cyborg, "It is not clear who makes and who is made in the relation between human and machine. It is not clear what is mind and what body in machines that resolve into coding practices" (p. 24).

It is important to understand how these new bodily and coded practices are shaping our lives and societies. As David Buckingham (2020) emphasizes:

We're moving quite quickly to a situation where our whole society - our political system, our economy, our arts and culture, our working lives, as well as our social and intimate relationships - are suffused with media technology. Almost everything is mediated. (p. 234)

To comprehend these intricate and ubiquitous connections, which are still quite new, scholars, educational institutions, and youth organizations have embraced the concept of digital literacy. First coined by Paul Gilster in 1997, digital literacy was initially defined as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). Digital literacy is presently

often used in its plural form, “to acknowledge the multiple and varied practices young people draw on to make meaning of the world” (Pangrazio, 2018, p. 18).

In the upcoming sections, I trace the conceptualization of digital literacies across different onto-epistemological stances on human relationships with technologies. I show the promise and the limits of these stances and gesture toward a relational ontology. I then outline my research goals and questions, followed by an explanation of my approach to addressing these inquiries. Finally, to conclude this introduction, I will provide an overview of the structure of this dissertation.

1.1. Digital Literacy: A Literacy like the Others?

This section aims to trace the emergence and evolution of the concept of digital literacy. In this partial retrospective analysis, several approaches discussed here draw upon earlier conceptions of literacy, which traditionally referred to the ability to read and write text (Jones & Hafner, 2012). In this context, digital literacy can be seen as the most recent iteration of what is understood as literacy. Scholars such as Hilary Janks (2000) or Kalantzis and Cope (2012), recognize that literacy is intimately linked to the development of various technical objects throughout history, such as papyrus, parchment, pencils, paper, pens, typewriters, and computers. Along these lines, the concept of digital literacy often highlights the one-sided relationship between humans and technology, emphasizing individuals' activities with digital tools. However, this focus fails to fully capture the potential co-production of literacy and technology.

Mary Kalantzis and Bill Cope (2012) propose the concept of the three globalizations to shed light on three historical moments in which literacy and technologies are entangled. The first globalization occurred with the emergence of the first languages. Humans could express meaning in different and multimodal ways, such as through dances, gestures, songs, and signs on bodies. The second globalization occurred with the advent of writing, perceived as the symbolic representation of language. According to Kalantzis and Cope (2012), writing introduced a tremendous change in the way humans organize societies. Initially, writing was predominantly used by elites as a means of social control within a power system. Over time and with new technologies such as the printing press, it became a governance tool for standardizing, regulating, and controlling narratives, encompassing rules and values. The third

globalization emerged with the advent of what was once referred to as "new technologies of communication," enabling signs, images, and sounds to be produced by the same device to broad audiences (from one to many), such as radio and later television. To address these societal shifts, various attempts have been made to adapt literacies to techno-social changes.

Scribner and Cole (1981), two social psychologists studying literacy practices among the Vai peoples in Liberia, conceptualized literacy as "a set of socially organized practices which make use of a symbol system and a technology for producing and disseminating it" (p.236). Their proposition that literacy as an expression should always be thought of as plural, became a central principle of what became known as the New Literacy Studies. Accordingly, literacies do not simply involve knowing how to encode and decode a particular kind of script but also how to apply this knowledge for specific purposes in specific contexts of use (Scribner & Cole, 1981). According to them, practice involves three components: technology, knowledge, and skills.

Other early attempts to conceive of digital literacy, focused primarily on the specific skills individuals should possess. Paul Gilster (1997) was one of the first to introduce the concept of digital literacy, identifying three core competencies: the ability to think critically, the ability to assemble knowledge from different sources, and the development of effective search skills. According to Gilster (1997), unlike other forms of literacy, digital literacy does not primarily concern the ability to write code or language. Rather, it emphasizes the ability to read and search for knowledge.

This perspective remains significant as it prompts us to consider the skills or competencies that people need to acquire in order to navigate everyday digital technology practices. In Amy's case, she appears to be adept at using and comprehending digital devices, suggesting a 'level' of digital literacy. However, viewing digital literacy solely as an individual skill discernable across 'levels', overlooks the affective, bodied relation Amy has with technologies, as well as the entanglement of technologies in the broader social, cultural, and contextual aspects of Amy's life.

Scholars, drawing inspiration from the ideas presented by the New Literacy Studies, and more specifically in the influential essay by the New London Group (1996), *A Pedagogy of Multiliteracies: Designing Social Futures*, expand upon Gilster's definition

of digital literacy as multiple skills, by asserting that digital literacies are *social practices*. They emphasize the importance of understanding these practices within their social context, particularly in relation to power dynamics and relationships. The New London Group did not explicitly refer to digital literacy, focusing their essay on multiliteracies to provide a “theoretical overview of the connections between the changing social environment facing students and teachers and a new approach of literacy pedagogy” (p. 60). In this essay, they introduced the idea of design as a key component of literacy education. Luciana Pangrazio (2016), for example, refers to their work when she explains that defining digital literacy is complicated as the spaces, tools, and texts that conceptualize practices are continually changing. She further argues:

(...) digital design literacies respond more specifically to the digital context and therefore represent a potential way forward for critical digital literacy. While this approach is focused on the outcomes of making, creating and producing, it provides an avenue for individuals to express their ideas, values and beliefs and in this way can mobilise personal or affective responses to digital texts. (p. 166)

These approaches to digital literacies, including the design and reinsertion of digital practices within the social sphere, are crucial to comprehending what people’s practices with digital technology are and to considering the context of these practices.

To illustrate this point, let us think about Amy once again. The social practices paradigm goes beyond simply observing what Amy is doing, such as reading the news, listening to podcasts, writing, drawing on her iPad, and meeting with friends. It also considers the broader context of who or what has designed these technologies, what is enabled through them, and what is constrained. In this perspective, objects are made with a particular intention and a particular purpose. Within the framework of these practices, Amy can be regarded as digitally literate because she displays a high level of proficiency in using these technologies.

However, by focusing solely on individual skills and practices, the social practices paradigm fails to fully capture the nuanced dynamics between Amy and digital devices. It disregards the intricate interactions, preferences, and collective decision-making processes that shape her practices.

In response to the New London Group’s (1996) call for a deeper understanding of literacies as socially and politically formed practices, critical digital literacy scholarship

conceptualizes digital literacies as social practices within a specific context, allowing us to consider the everyday practices of digital literacies such as using social media platforms and video gaming, and situating these digital practices in the sociocultural context of power and culture. As with other literacy practices, the question of whose literacies are considered normative is a pressing one in digital literacy scholarship. Deborah Brandt (1998) develops the idea of sponsors of literacy as “any agents, local or distant, concrete or abstract, who enable, support, teach, model, as well as recruit, regulate, suppress, or withhold literacy – and gain advantage by it in some way” (p. 166). Whether they are community leaders, academic institutions, or technology companies, they ultimately control “the ideological freight that must be borne for access to what they have” (p. 168). This *sponsors of literacy* approach reifies literacy practices as always being value laden and situated in networks of influence and socialization. According to Bhatt and MacKenzie (2019), companies such as Google or Facebook, names that often come back in the different interviews of this study, are among today’s influential sponsors of literacies. Consequently, the philosophy of these companies permeates the content and platforms they provide (Duguay, 2017b). According to Noah Golden (2017), critical digital literacies seek “to investigate manifestations of power relations in texts and to design, and in some cases, redesign, texts in ways that serve other, less powerful interests” (2017, p. 3). This approach considers not only the individual and digital technology, but also the power relations pervading these relationships.

The value of the critical digital literacies approach dwells on the recognition of the active role of objects in these relationships. In these conditions, Amy is not considered in isolation, as her practice is influenced by digital technologies and their contexts for use. The digital device or application is then recognized as an object defined by the ideology of its creators that led to its creation. However, although this approach allows the recognition of flows of power and the active role of the device or the application in literacy practices, it does not often offer an understanding of the processes in action or of what emerges through these relationships.

As shown in this brief overview, various approaches to digital literacies offer distinct perspectives on the relationship between Amy and digital devices. While the first definitions of digital literacy discuss a list of skills needed by the individual, scholars inspired by the New London Group also consider the context of use and the design of the digital devices. Critical digital literacy, for its part, emphasizes the circulation of

power dynamics in digital literacy practices. While the existing approaches acknowledge the skills, practices, and social context surrounding digital literacy, they often overlook the tangible and productive dimensions of this relationship. This oversight fails to consider the material properties, affordances, and constraints of digital devices, as well as the ways in which they shape and influence interactions with young people. As Luciana Pangrazio (2016) underlines, “the increased complexity of contemporary digital contexts has caused several researchers to call for new frameworks through which to study and develop these new literacies (Avila & Pandya, 2013; Coiro et al., 2008)” (p. 164). In other words, Pangrazio is calling for a consideration of both the multiplicity and complexity of digital contexts. She implies that complexity will not be easily contained by the development of digital literacy frameworks.

This study aims to contribute to Pangrazio’s call to grasp the complexities at play in Amy’s description of her everyday life with digital technologies. In light of the ubiquity of digital technologies in various aspects of life, it is necessary to go beyond the traditional frameworks and explore the broader implications and intricacies of the relationship between young people and digital devices. This study aims to contribute to this understanding by delving into the multifaceted dynamics, encompassing the materiality, collective experiences, cultural influences, and political implications embedded within these practices as they shape and are shaped by young people’s lives.

1.2. Toward an Ecological Approach of Digital Literacies

In the past decade, scholars have acknowledged the necessity of advancing digital literacy theories by considering not only what transpires on the screen, but also what occurs behind or even beyond the screen. These approaches investigate not only what happens at the level of using these different applications (super-screenic literacy) and what these sponsors of literacy, through coding languages, convey in terms of processes and values (subscreenic literacies).

Tom Lynch (2017) insists that we must explore the concept of “sub-screenic literacy”, which he defines as “computational and human languages that are used to create software. It refers to things like computer code and APIs (Application Program Interfaces), which are long strings of data pushed to and pulled from systems”(p. 92).

Consequently, considering this literacy also involves focusing on the various constraints and opportunities provided by the underlying code.

In addition to super-screenic literacies, scholars have also highlighted the significance of "sub-screenic literacies" (Golden, 2017; Lynch, 2017). These literacies encompass the systems and processes that enable the functioning of what appears on the screen. It is crucial to recognize that our practices of super-screenic literacy are constrained by those who produce and control the sub-screenic literacies that underpin them (Lynch, 2017).

By acknowledging the interplay between super-screenic and sub-screenic literacies, scholars aim to shed light on the broader dynamics and power relations that shape digital literacy practices. This expanded perspective enables a deeper understanding of the complex interactions between individuals, digital devices, and the underlying technological systems.

In the last five years, several scholars have underlined the need to conceive of a more holistic approach of digital literacies, not only considering individual and digital devices but also educational, social and political aspects. Sefton-Green and Pangrazio (2021) advocate for a more intricate approach to digital literacy, highlighting that frameworks should not focus solely on the individual. They argue that data processes simultaneously deconstruct and collectivize the individual, as desires and actions can be recorded, transformed into digital data, analyzed, and ultimately commodified. They recognize that the pervasive datafication of educational experiences reshapes the very nature of the learner and the dynamics of learning: "In some respects, the designers and developers of big tech have their own motives and interests in the agency and self-reflexivity of users (to commodify and economically exploit interaction) – contributing to a crisis for the educative subject" (p. 2). Sefton-Green and Pangrazio clearly express the active role of digital device and application providers in the educative experience of the individual. They go further and, in this case, join Ruha Benjamin (2019)'s assertion that datafication reshapes both the learner and learning processes. Hence, this conceptualization raises:

(...) new epistemological and ontological challenges forcing us to consider not only how it impacts education as a distinct field, but also how these changes affect the constitution of the educative subject and their capacity

to learn and think reflexively, critically and creatively about the world in which we live. (Sefton-Green & Pangrazio, 2021, p. 4)

While focusing on education, Sefton-Green and Pangrazio acknowledge here that the conception of digital literacy needs to also consider social and political dimensions, among others.

Similarly, Leander and Burriss (2020) advocate for alternative perspectives on digital literacies, moving away from traditional representational paradigms. They propose that approaches influenced by posthumanisms and new materialisms offer a way to go beyond the conventional notions of "text" and "reader." These alternative perspectives enable the exploration of diverse elements within digital systems and their interconnectedness. By looking "at what happens behind the screen and the dynamics which happen before and after media's representative societal function" (Reichert & Richterich, 2015, p. 8), these approaches emphasize the significance of understanding the behind-the-scenes processes and the broader contextual factors that shape and influence digital literacy practices.

These new perspectives on digital literacies, known as digital materialism, bring complexities to the relationships between Amy and her digital devices. In contrast to previous approaches, digital materialism focuses not only on the individual, the object, and what they produce together, it also considers what emerges from these relationships and highlights the significance of these interactions for education.

In this research, Gilbert Simondon's work serves as the key theoretical foundation. Simondon, in his 1958 doctoral dissertation, delves into the intricate relationships between individuals and technical objects. His philosophical framework conceptualizes both individuals and objects not as static final products but as dynamic processes that evolve in non-linear ways through the temporary resolution of tensions, facilitated by their relationships with one another. While Simondon did not explicitly employ the term "technical object" to encompass digital devices and applications during the time of his writing, this research employs this terminology to capture the notion that digital technologies are not fixed end-products but rather intertwined within ongoing processes that evolve through relational dynamics.

By drawing on Simondon's insights, this research aims to shed light on the complexities and dynamics inherent in the relationship between individuals and digital devices, emphasizing the evolving nature of these relationships and the role they play in shaping digital literacy practices.

This research also looks at the work of new materialist and posthuman theorists, such as those of Gilles Deleuze and Felix Guattari (1988) and Bruno Latour (2005) who advance process theories that do not attempt to predict or “tame” the social environment but, rather, to think about the heterogeneous practices of association that make it up. These approaches assert that the material world is not passive or simply responding to human actions or intentions. Instead, it plays an active role in how these practices unfold. Importantly, this approach decentres the human and focuses on the productivity of relations between humans and more-than-humans.

New materialist and posthuman approaches enable new insight when analyzing phenomena such as Artificial Intelligence (AI) (Leander and Burriss, 2020). Because these theories observe the agencies of both humans and more-than-humans in technological encounters, they tend to include in their analysis the design of the interface (Wittkower, 2016; Duguay, 2017), and the ubiquity of the software (Parikka, 2012). This perspective, as Smythe et al. (2017) recognize, “does not promise clarity, universality or finality about these relationships; however, it may be able to deal more effectively with the complexity of events in education settings that we have heretofore not been able to pay attention to” (p. 22).

The main goal of this thesis is to reconceptualize digital literacies, thinking of them relationally and analyzing their implications on multiple domains (educational, political, and cultural). Relying on the acknowledgment of the never-ending processes of both individuals and technical objects evolving through relationships, it aims to take seriously the intensity of these relationships. To do this, I attempt to define or redefine what is at stake in these relationships and to re-think both “individuals” and “technical objects” by attending to what is produced and what or who is impacted in these entangled relations. Ultimately, the objective is to examine potential pedagogical strategies from within these entanglements.

1.3. Research Questions

As the introduction has touched upon so far, digital literacies are part of an ever-changing field. Consequently, as this thesis evolves, matures, and investigates new perspectives, new questions arise. In answering these questions, I carry out an ethnographic study in two different community-settings welcoming young people who had recently arrived in Canada, spending time with and conversing with them, and reading these experiences and meanings through sociology, philosophy, techno-sciences, feminist, literacy and education literatures.

Listed below are the two primary questions, which are supported by secondary ones. These are general at first and are refined toward the concluding chapter through my reading of theories as well as the reading of data.

1. What are the relationships between young individuals and digital devices or applications?
 - How do young people and technical objects experience each other? How do they evolve together? How do they shape each other?
 - What are the social, cultural, and political dimensions (including power relations) pervading these relationships?
2. How can we approach digital literacies to take into consideration individuals from diverse cultural and social backgrounds and digital devices and their multiple dimensions?

1.4. How Does this Thesis Aim to Answer these Questions?

Rather than engaging in a critique of existing approaches to conceptualizing digital literacies, this study takes a different path. It does not seek to invalidate or undermine the value of these approaches, which have contributed to the understanding of digital literacies as seen earlier. As a PhD student, I acknowledge the importance and significance of these approaches, having been trained and influenced by them.

This thesis takes a distinct direction by focusing on redefining the notions of *young individual* and *technical object*. By reframing these concepts, the study aims to provide fresh perspectives and insights into the dynamics and complexities of the relationship between young people and digital technologies. These redefinitions open up

new avenues for understanding the entanglements and interactions between individuals and technical objects in the context of digital literacy practices.

This theorization of young individuals and technical objects as well as other constructs that populate this thesis is based on what Alecia Jackson and Lisa Mazzei (2012) call “thinking with theories.” In this approach, theories, philosophy and social life are plugged-in together and put into conversation. In so doing, I recognize that my understanding of what an individual is and what a technical object is evolves according to the observation and interviews I carried out. This understanding is also shaped by the different articles and books I have read so far, my experiences, and particular becomings. How observation, interviews, theories, and social life are connected is important. Jackson and Mazzei (2013) explain that the zone of connection, what they call the *threshold* is of particular importance. They define it as follows:

In architecture, a threshold is in the middle of things. It exists as a passageway. A threshold has no function, purpose, or meaning until it is connected to other spaces. That is, a threshold does not become a passageway until it is attached to other things different from itself. Thresholds contain both entries and exits; they are both/and. A single threshold can be not only an entryway, but also an exit; therefore, the structure itself is not quite as linear and definitive as one might think. (p.264)

This approach is useful in this dissertation for conceptualizing what is commonly referred to as findings. Indeed, both chapter five and six are thresholds in which theories, methodology, and participants sharing intersect. These connections allow me to suggest new possibilities for a digital literacy framework.

Form this approach, Amy, like other participants of this research, has contributed to my understanding of young people, as well as my reading of scholars who specialized in the study of young people, as well as the study of technical objects. These various perspectives align or collide in this threshold, creating nuances. In so doing, data collected during this research are not perceived as illustrations or evidence of theories but rather as generative of new knowledges when put in relation to readings, conversations, the 23 interviews I conducted with young people and educators, and the several hours of observations that I was able to attend to in two community-settings. It is worth noting that plugging in these data with other theories would have generated other understandings and other questions to be answered.

Thinking with theories has implications on both the theoretical and methodological aspects of this study. For example, how can I study what emerges from relationships between individuals and technical objects without decentering the human being from the focus of my study? What is at stake here is the recognition of the inevitable relation of theories, data, and methods. In this thesis, I aim to make the relation visible and describe how these theories, data and thresholds have changed my perception of this study during these several years of work. I also take time to reflect on how these new “knowledges” (Haraway, 1998) influenced the questions of this research, and reshaped pedagogies and theories of the young people, the digital, and literacies.

1.5. Organization of the Thesis

The organization of this writing aims to reflect the lively process of this study. In so doing, I try to make clear to the reader how this inquiry evolves.

The second chapter of the thesis sets the stage to conduct this research. In the first part, I introduce the concept of flat ontology, decentering the focus of the investigation from a human perspective. This claim does not aim to overlook young people but rather to acknowledge what Gilbert Simondon (1958) calls the “mode of existence of technical objects”. Both young people and technical objects as theoretical constructs are analyzed in this chapter, prefacing the analysis of what can be the relation between them. The interest is not only in the human perspective but also in the object and how what emerges from their relationships changes the ontological stance of this thesis toward a relational ontology. This paradigm shift triggers the evolution of some research questions, changes that are reflected in the conclusion of this chapter.

In the third chapter, having located the participants of this research to then focus on their productive relationships in theory, this writing turns toward how this research can occur in practice, with regard to which lens and methods are used. Because nothing happens as expected, and even less when a worldwide pandemic crisis arises, this part also relates the constant adjustments and the evolving ethical precautions and issues that it faced.

Both the theoretical and the methodological approaches enable a specific writing of the different participants of this research taking into consideration their stories, their

metastable present and how they envision themselves in the future. That is what is related in chapter four. Indeed, as the research acknowledges the difference-in-itself (Deleuze, 2011), describing each participant and their sociogenic principles (Wynter, 2001) is essential to better understand their experiences.

The findings of this study are gathered through two thresholds encompassing five vignettes in chapters five and six. While chapter five focuses on the relationships of individuals and technical objects, chapter six delves into the political and collective dimensions of these relationships. This multi-faceted approach embraces the complexity and productivity of the diverse relations between individuals and technical objects. Each vignette triggers an analysis of two specific points aiming to better define the specificities of technical objects, what Gilbert Simondon (1958) calls their mode of existence, that are digital devices or applications, and individuals.

Chapter five introduces three vignettes. The first one analyzes how the design of these technical objects is significant in their first encounters and how design shapes and is shaped by these relationships. The second vignette analyzes the different processes that the individual is going through, namely psychic and collective individuation, as well as the process that pervades technical objects, namely the concretization. Considering these two processes shows how data emerges, thus triggering the process of datafication. The third vignette analyzes how individuals learn through the algorithmic processes of social media applications. Analyzing these processes at play questions what is visible and what is hidden in this relationship, what Bhatt and MacKenzie (2019) call the epistemologies of ignorance.

Chapter six relies on two additional vignettes. The fourth vignette dwells on the geopolitical dimensions of these relationships described in chapter five. Indeed, relying on the use of the application Google Maps, the analysis shows how mundane activity shapes the world and how we see it. The fifth and last vignette relates how the constraining process of registration for courses in post-secondary education institutions opens the possibility of collective individuation for students.

These five vignettes demonstrate not only how to approach the complexity of these relationships but also, to gain a better understanding of different actors and how they are taken into consideration in these different configurations.

The seventh and final chapter aims to answer a question that pervades the entire thesis: can we consider digital objects the same way that Simondon, in 1958, considered technical objects or shall we go further in this definition? If the goal of this thesis is not to bring a definitive definition about what digital objects are, refining the definition might help to better understand the digital part of the digital literacy framework that this thesis aims to enable. It is important to show how the positioning of both individuals and digital objects triggers the needed localization of the technicity and agency in these relationships. This step is critical in understanding potential objectives of these digital literacy frameworks. In the second part of the chapter, a digital literacy framework is outlined, drawing upon diffractive and speculative methods. This framework is formed by eleven principles that converge in a manifesto for a new relational digital literacy.

Chapter 2. From a Flat to a Relational Ontology

2.1. Introduction

The introduction of this dissertation has highlighted the prevailing focus in existing literature on digital literacy, which primarily centres around individuals' usage of technologies and the activities they engage in with these objects. While this individual-centric approach provides valuable insights into users' behaviours and practices, it tends to overlook the mutually generative relationship between individuals and technical objects.

Nevertheless, this dissertation takes on the perspective that the significance of a technical object only emerges within the context of its relationship within a network. Drawing on Gilles Deleuze and Felix Guattari's (1988) argument, the dissertation recognizes that people perceive the world differently based on the technologies they employ, indicating that the relationship between individuals and technologies is a productive one. Technology becomes a means through which human subjectivity unveils the truth and latent potential inherent in the world (Mansfield, 2000, as cited in Savat, 2012). Therefore, when analyzing how individuals experience the world, it is essential not to separate human beings from technological entities.

This chapter serves as a theoretical foundation for the relational approach to both the individual and the technical object in this thesis. It adopts the "thinking with theories" modalities, as developed by Alecia Jackson and Lisa Mazzei (2013), to guide the conceptual development of this research. As a result, it is recommended to read this chapter linearly to fully comprehend the progression of the theoretical ideas that shape this thesis.

I start with the willingness to flatten the social with the description of the flat ontology. This flattening is critical to better grasp what is at stake in terms of social, cultural, and political aspects of the phenomenon and who or what entities are considered through this writing. Indeed, how would it be possible to consider the political aspect of this relationship if neither the individual nor the technical object can be located culturally or socially? Once this flattening has been defined, it will help to delineate, albeit temporarily, some of the key actors of this study. These actors include processes

of individuation—both at the psychic and collective levels—sociogenic principle, and concretization, which manifest in both human and more-than-human entities. By defining and understanding these processes, as well as the relationships that are becoming together, the focus of this study shifts toward a relational ontology.

Figure 1 shows how the concepts form a relational ontology.

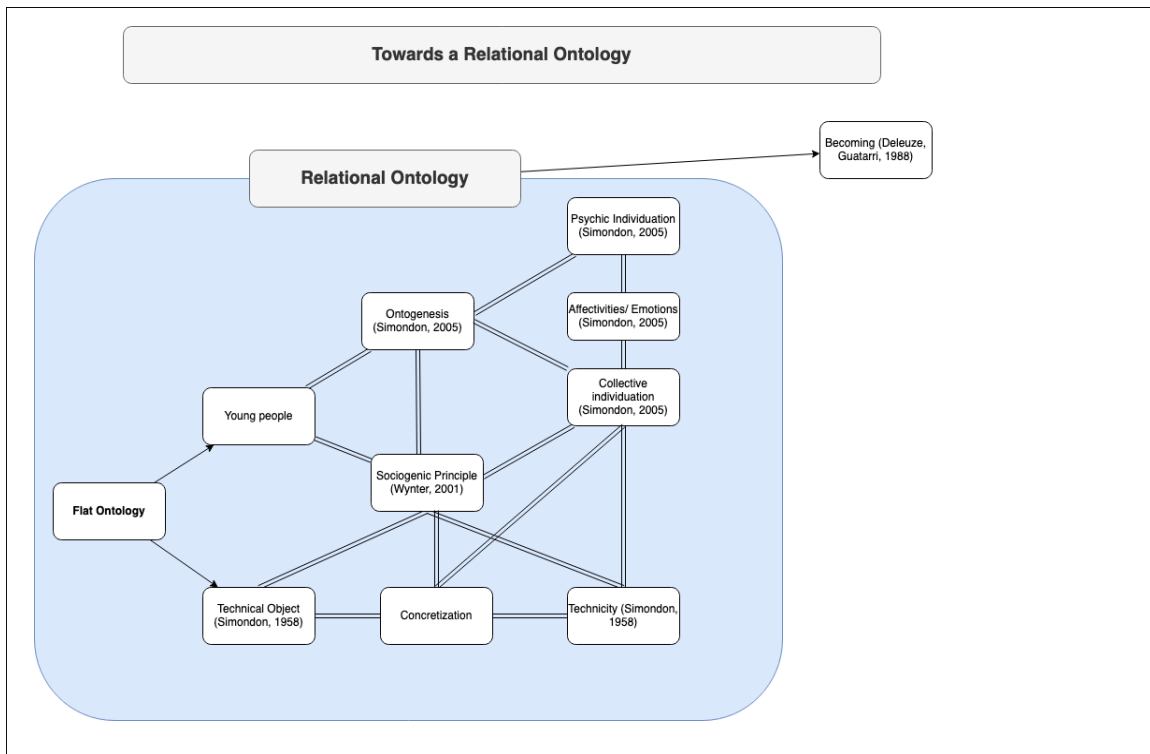


Figure 1: Mapping the theories that relationally shape thinking

2.2. Flat Ontology

The concept of flat ontology is derived from the work of Bruno Latour (2005), who proposes an analytical framework that considers all elements involved in influencing action as actors. This approach aims to go beyond human-centric perspectives and recognizes the agency and contributions of more-than-human elements, including technical objects, software, codes, digital policies, as well as affectivities and emotions.

By flattening the social, Latour emphasizes the interconnectedness and co-constitution of various actors, both humans and more-than-humans, in shaping social phenomena and practices. This approach allows for a more comprehensive

understanding of the complex dynamics and influences at play within digital practices, moving beyond focusing solely on individual or social aspects and acknowledging the role of diverse elements in mediating these practices.

Adopting a flat ontology and considering young people, adults, educators, and technical objects as interconnected actors, challenges the taken-for-granted assumptions and binaries that often limit our understanding of these relationships. By positioning all these actors on the same level and recognizing their mutual connections, the analysis moves away from traditional dichotomies such as human/non-human or nature/culture. Suresh Canagarajah (2018) describes it this way:

A flat ontology challenges the traditional adoption of binaries and hierarchies, such as mind/body, cognition/matter, human/nature, time/space, expressive language/mute objects – with the first term in each pair treated as primary. Flat ontology argues for the agency of all these entities, enjoying the equal status and shaping each other in activities (p. 271).

This approach allows for a more nuanced and complex exploration of the dynamics at play. It acknowledges that young people, adults, and educators are not isolated entities but are intricately connected to technical objects, circulating discourses, affectivities, and emotions. In this perspective, there is no predefined hierarchy or fixed categories of entities, and the distinction between micro- and macro-levels becomes blurred.

As Latour (2005) explores in his Actor-Network-Theory, what matters is not only the different actors of a phenomenon but how they relate to one another.

[T]o distinguish a priori ‘material’ and ‘social’ ties before linking them together again makes about as much sense as to account for the dynamic of a battle by imagining a group of soldiers and officers stark naked with a huge heap of paraphernalia—tanks, rifles, paperwork, uniforms—and then claim that ‘of course there exist some (dialectical) relation between the two’ (p. 75).

In this example what makes a soldier is not only being a human but also the becoming of the soldier in relation to uniforms, paperwork, guns and the battlefield.

Returning to the first excerpts that opened this dissertation, when Amy explains her morning routine, she mentions the multiplicity and interconnectedness of actors at play in her digital practices:

if I don't listen to podcasts, I feel like I'm wasting [my] time on the Skytrain and it just feels so boring. So, I really need to make sure I charged my headphones, I charged my phone so [...] I can listen to something that keeps me like entertained. (Amy)

Amy's description encompasses not only her usage of digital devices but also the emergence of various other actors such as affect, emotions, and connected actions, like ensuring that her digital devices are adequately charged.

Before proceeding, it is crucial to establish the conceptualization of two key actors in this thesis: young people and technical objects. Understanding the definitions of young people and technical objects is fundamental in comprehending the ontological perspective of this study and how it enables an emerging and relational conception of digital literacy. In analyzing both actors, I draw primarily from Simondon's theorization (1958/2008) which conceptualizes individuals and technical objects as processes. I firstly examine them separately before exploring their interconnectedness.

2.3. From Young People to Individual

The definition of the individual in this study is divided into two sections. The first section relies on a political discourse positioning youth in the context of the pandemic and focuses on understanding the construction of young people's identities within the specific context of British Columbian society. It considers the influence of political factors, such as ideologies, and discourses, in shaping societal perceptions and representations of young individuals. Additionally, it incorporates insights gained from various organizations that were contacted for the ethnographic study, providing valuable perspectives and experiences on how the perception of young people is constructed within the given context. The second section of the definition aims to provide a detailed explanation of the theoretical approach that will be employed in this dissertation. This theoretical framework outlines the conceptual tools, perspectives, and theories that will inform the research findings.

Young People, Youth...

'Youth' and 'young people' are broad terms that can lack precise definitions and may be subject to interpretation and variation both in everyday discussions and scientific literature. For example, on March 29, 2021, during his daily intervention on the evolution

of the COVID-19 pandemic, BC Premier, John Horgan publicly targeted the behaviour of whom he calls young people in the propagation of the pandemic¹:

Dr. Henry [BC public health officer] and Minister Dix [BC Health Minister] are following the rules. They are paying attention to the details and focusing on and making sure that they do their part to get British Columbia through this. The cohort from 20 to 39 is not paying as much attention to these broadcasts and quite frankly is putting the rest of us in a challenging situation. I'm asking, I'm appealing to young people to curtail your social activity. [...] but my appeal to you is do not blow this for the rest of us, do not blow this for your parents and your neighbours and others who have been working really really hard making significant sacrifices, so we can get good outcomes for everybody.

This short excerpt from Horgan's intervention provides an example of how young people are defined and perceived in British Columbia by public figures such as politicians. In this context, young people are characterized based on two criteria: their age and their behaviour.

Indeed, if the age range used to define young people can vary depending on the specific context and the institutions involved, age remains the most obvious, and the most used criteria to define this population. The BC Premier's discourse defines young people as those within the age range of 20 to 39 years old. On the other hand, certain programs funded by the federal government may adopt a narrower age range to define young people, specifically ranging from 15 to 24 years old.

The differences in age ranges used to define young people can stem from various factors, including the objectives of the programs, legal definitions, and policy considerations. Institutions may adopt different age ranges based on their specific mandates and target populations. These variations highlight the contextual nature of defining young people and the flexibility that exists within different institutional frameworks.

In scientific literature too, labelling a person as 'young people' is more complicated than mere age. For example, as the social media and youth scholar danah boyd (2008) underlines in her dissertation, teenagers are not a natural category but rather a social invention that is characterized by compulsory schooling, which has

¹ <https://youtu.be/TiwKl1aWpn8> video accessed on April 13,2023

resulted in youth becoming isolated in their roles from the older and younger generations. Similarly, in his cultural history of adolescence, the British writer Jon Savage (2007) argues that the social categories of childhood and 'teenagerhood' emerge for varying social, political, and economic reasons and were justified through developmental psychology. In other words, the constructs of adolescence or youth are historically and culturally dependent (Ariès, 1962).

Within Western psychology, youth is often defined not only by age but also by the roles and thresholds that individuals have to navigate during this life stage. Jeffrey Arnett (2015) highlights the notion that youth share a common culture distinct from both young children and adults.

According to Arnett's conceptualization, youth is characterized by a set of experiences, attitudes, and behaviours that differentiate them from other age groups. This shared culture among young people is shaped, in part, by the challenges and transitions they face as they navigate various thresholds, such as obtaining a driver's license, finding employment, or living independently away from their parents. These milestones mark important transitions between childhood and adulthood and contribute to the formation of a distinct youth culture.

This understanding of youth as a distinct cultural group, defined by shared experiences and meeting specific thresholds, can be valuable in fostering a shared understanding of what it means to be a youth in Western societies. It recognizes the unique experiences and challenges faced by young people during this transitional period and acknowledges their distinct cultural identity. However, it is important to note that cultural definitions and experiences of youth can vary across different societies and contexts. Therefore, it is essential to consider the cultural and contextual nuances that shape the experiences and identities of young people in different settings.

Furthermore, as seen above, labelling young people appears to be complicated as the different terms often lack clarity: am I writing about children? Teenagers? Young adults? I face the same dilemma as danah boyd (2008) when she writes:

Initially, my focus was more broadly on "youth." Prior research on early adopters and subcultures (boyd 2008b) had led me to think through the construction of youth culture. Yet I quickly found the label "youth" too unwieldy for this project. The term itself lacks clarity— is it defined by age

(e.g., anyone over 14 and under 24), legal standing (e.g., “minors”), life stage (e.g., unmarried individuals with no children), or something else? Literature on childhood, teenagers, youth, adolescence, minors, and students only complicated matters. More important, the population marked by such a label is too diverse for analysis. (p. 56)

However, using the terms ‘young people’ or ‘youth’ might also suggest the specificity of these individuals, thereby differentiating them from children or adults. Consequently, every definition of young people or youth implies not only subsequent definitions of adults or children but also the idea of a rupture with childhood and a homogenous step toward adulthood. This transitional phase, referred to as youth or young people, can be problematic as it tends to essentialize the individuals and raises questions about its validity.

Indeed, what is pervasive in John Horgan’s allocution is the uniform definition of young people who, supposedly, put in danger all the efforts made by the rest of the population. There is here an underlying assumption that ‘young people’ either need to be protected from society, or that the rest of the society needs to be protected from them.

Essentializing a part of the population is certainly practical to generalize behaviours but does not reflect the reality of this research. In this study, all participants are from diverse cultures, racial identities, genders, and socio-economic backgrounds. This is particularly significant as all the human participants in this thesis arrived in Canada from another country. Consequently, they do not all experience the world the same way. Therefore, analyzing youth relationships with technical objects through a unified framework would risk glossing over this diversity.

To mitigate the risk of essentializing the participants as young people, this research adopts an alternative perspective that views them as individuals rather than as part of a homogeneous social and cultural category. Instead of treating young people as singular, monolithic groups, the study recognizes the complexity and diversity of their experiences. The research acknowledges that each individual undergoes a unique process of individuation, informed by specific sociogenic principles that I will describe later in this thesis, recognizing the uniqueness of each of them and emphasizing the importance of understanding their specific experiences, aspirations and challenges. At the same time, the research also acknowledges the collective dimension of individual’s

experiences. They are not isolated entities but are influenced by and actively engaged in broader social, cultural, and relational contexts.

In researching the individual and the collective, this study draws primarily on Gilbert Simondon's (2005/2007) conceptualization of *individuation*, which provides a theoretical framework for understanding the process through which individuals emerge and evolve. However, I also incorporate perspectives from those who critique Western concepts of the Individual and the Human, including feminist and Black scholars.

Feminist and Black perspectives enrich the analysis by shedding light on the intersectional aspects of digital literacy practices and how power dynamics, social inequalities, and individuations intersect with the use of digital technologies. This multi-dimensional approach acknowledges the complexities and nuances of the concept of the Human that is often read through individuals' experiences, considering their diverse socio-cultural contexts and the specific challenges and opportunities they face in relation to digital literacy during the COVID-19 pandemic.

To better comprehend and illustrate how these theoretical constructs introduce a new approach to young people and their realities, I create a portrait of Amy whom we met in the introduction of this dissertation. This portrait originated from my interactions with her while we were volunteering together in a community setting, as well as during the interview we had together in 2021 during the COVID-19 pandemic.

2.3.2. Amy's Portrait

Amy was a nine-year-old when she arrived with her mother in British Columbia from China. During her first year of school, in Grade 4, adaptation was hard as she could barely speak English and that nobody talked to her. Her first schooling in Canada was in an English Language Learning class.

She rapidly managed to improve her English proficiency and started to develop her social network. When she got to high school, she started volunteering in diverse clubs, as well as in other programs.

Twelve years after her arrival, she is now enrolled in a work-study program, sharing her time between the university and her workplace, a veterinary laboratory. A

typical day for Amy would also involve extra-curricular activities as she is a committed volunteer, in several humanitarian or research clubs at her university. Whether in high school or now at the university and in other community settings, volunteerism is, according to her, “a pretty common part of my life” (Amy).

As shown in the introduction of this thesis, all her activities are pervaded by digital through the uses of her mobile phone, tablet, and laptop and through different applications of social media, video and music streaming that provide her entertainment and feel like she is not wasting her time. Her use of digital technologies has intensified since the start of the COVID-19 pandemic. During this period, she misses the daily social aspects of her life: if she still goes to her workplace every weekday, she mostly spends her evenings online with her club peers. She thinks that it has become harder to connect with her classmates now that everything is online. She also mentions, during an informal conversation, that she doesn't go outside anymore, except for grocery shopping, once a week. Additionally, she stopped volunteering in person in the community setting where we were together when the second wave of COVID-19 reached British Columbia. However, she mentions that the pandemic has little impact on her relations with friends and family members who are still in China.

In the future, Amy would like to be a physician after finishing medical school and work close to where her mother lives as she is her only relative outside of China.

2.3.3. Individuation

This portrait of Amy underlines the entanglement of different individual and collective processes. To better understand what is at stake in these processes, we must consider how the concept of individuation is integral to specific trajectories of each individual's past, present, and potential in relation to their milieu and moves us away from any essentialization of young people. For example, Amy's activities during the pandemic appear to be in complete opposition with what John Horgan describes. As she mentioned, except for transiting to her workplace and the grocery shopping once a week, she stays at home for all her other activities (gathering with friends, volunteering...) that have moved online. Even if she is between 20 and 39, as the BC premier defines young people, she is very cautious to “not blow this for the rest of us, do

not blow this for your parents and your neighbours and others who have been working really really hard making significant sacrifices.” (Horgan, March 29, 2021)

Simondon (2007) conceptualizes individuation mainly as a process of ontogenesis, a term he borrows from biology, to describe the genesis of the individual. Using this theorization to focus on the ongoing process, the articulation with Sylvia Wynter’s understanding of sociogenic principle in her inquiry of what it means to be human is also critical in grasping new ways to understand young people and how power circulates in a Western society. Indeed, Wynter’s theorization, as I will elaborate below, encourages us to perceive the human not only as a biological unity but as a hybrid being. In her conversation with Katherine McKittrick (2015), she explains this hybridity as well as the consequences on the system of knowledge:

Once you redefine being human in hybrid mythoi and bios terms, and therefore in terms that draw attention to the relativity and original multiplicity of our genres of being human, all of a sudden what you begin to recognize is the central role that our discursive formations, aesthetic fields, and systems of knowledge must play in the performative enactment of all such genres of being hybridly human. (p. 31)

Ontogenesis

Gilbert Simondon is often cited as a “thinker of technics” but the approach of individuation he developed in the first part of his thesis in 1958, and published in 2007, provides what Muriel Combes (2013) calls an “in-depth renewal of ontology” (p. xxi). He inspired numerous scholars such as Gilles Deleuze and Bruno Latour’s process theories. Simondon’s individuation is a philosophy of movement, unpredictability and relation. His concept of ontogenesis moves away from both the substantialist and hylomorphic approaches to conceptualize the reality of the individual as an individuating being, always becoming.

The substantialist view defines a being as consistent in its unity and self-sufficiency. In this approach, the individual *is* what they were always meant to be. This view supports some discourses, such as Horgan’s speech, in which young people are envisioned as a specific and homogeneous population whose behaviour and actions can be defined according to the category in which they are placed.

The hylomorphic perspective, in contrast, reveals the being as an individual emerging from within an encounter of matter and mould, or the physical being and its culture. We can sometimes find this prospect in the literature about young people in which educators are supposed to shape the child or the adolescent, provide them with skills needed to fulfill their potential, and become the ideal of a good adult, a good citizen (Noula, 2019.).

If the substantialist way insists on the permanency of the idea we might have of young people, the hylomorphic perspective suggests the permanency of the mould. Both views are deterministic in the sense that the individual is not accorded much agency. Moreover, these concepts define individuation as a result, a consequence of processes, and not as a *process*.

Gilbert Simondon (2007) suggests a third approach focusing on the process of individuation, that of “ontogenesis.” He focuses on what is happening in the present rather than on the causality of the being. This ontogenesis, through which the being becomes, allows him to comprehend the individual in their relative reality in one of the individuation phases. In other words, he “seek[s] to know the individual through individuation rather than individuation through the individual” (Simondon, 2007, p. 23).

Analyzing individuation as a process and not as a final product allows us to consider the uniqueness of each individuation experience: “We cannot claim to study individuation in general. We are always dealing only with singular cases of individuation, which complicates the task of a global theory of individuation” (Combes, 2013, p. 12). However, escaping generalization does not imply that individuation occurs randomly or without constraints. As we will see later, Simondon's theory recognizes the influence of social, cultural, political, and economic factors as part of the milieu, which are conducive to creating tensions. These tensions and their temporary resolutions lie at the heart of the individuation process. Therefore, this dissertation acknowledges the diverse and unpredictable individuations of individuals and the impossibility of essentializing them.

According to Thomas Keating (2019), “Simondon’s philosophy accords an understanding of individuals as necessarily indefinite (potentialised, intensive) and incomplete (non-unified, forceful) products of individuation” (p. 217). Simondon’s

philosophy is one of movements and instabilities, valuable for those wanting to analyze individuals in relationships without essentializing them as subjects.

Simondon rejects the notion of linear progression or a straightforward developmental trajectory. He conceives the individual as always being in process, where everything is in flow and inherently changing. Accordingly, if something appears to be stable, that stability is relative to a frame of reference or, more precisely, to a concern such as discovering a new culture, or a new society.

Individuation, as conceived by Simondon, can only happen in a metastable equilibrium, which is an equilibrium packed with tensions but also consequently full of potential. Individuation is then conceived as a discovery in a conflictual situation, as a temporary resolution of tension. Some obvious metastable equilibriums happened during this research, such as the development of the worldwide pandemic. Amy, for example, had to move all her extracurricular activities online during the pandemic as she did not feel comfortable continuing them in person. To face these metastable equilibriums, she manages to find a temporary solution by using online platforms allowing her to continue her social activities.

Tensions and their temporary resolutions occur in what Simondon calls an *associated milieu*. No individual can exist without a milieu that is their complement, arising simultaneously from the operation of individuation. In Simondon's philosophy, the milieu is different from the social context or environment because it is always concomitantly created through its reciprocal and dynamic relationships with the individual. For example, going back to Amy, through her narrative during the interview, her milieu is partially created by her story, emigrating from China with her mother when she was a nine-year-old without knowing the English language. Her associated milieu is also built through her activities, her internship, her university, friends and volunteering engagements, and her use of technical objects. All these elements are related to each other, generating both tensions and temporary resolutions of these tensions. This is the relation between the individual and the milieu that allows individuation. According to Muriel Combes (2013), Simondon suggests an ontological postulate which is that individuals result and consist in relations. Consequently, a relationship has the status of being and constitutes being. The focus on relations rather than on the *individuating being* is useful for studying the multiple dimensions of a phenomenon such as the digital

one. It also relocates the individual as part of a network of relationships and not as the intact centre of a phenomenon.

The definition of individuation as proposed by Simondon encompasses multiple phases, namely the pre-individual, psychic, collective individuations, and the transindividual. These phases are not bound by specific chronological boundaries and can overlap with one another. For instance, while the pre-individual phase may initiate the individuation process, the subsequent phases do not replace or diminish the significance of this initial phase. Instead, the development of these phases is not linear but intertwined within the individuation process. In other words, if the pre-individual phase emerges first, it coexists and is entangled with the psychic and collective individuations.

Simondon defines the pre-individual as a phase full of tensions and potential, a phase that no individuation can exhaust, as he specifies:

The individual would then be grasped as a relative reality, a certain phase of being which presupposes before it a pre-individual reality, and which, even after individuation, does not exist on its own, because individuation does not suddenly exhaust the potentials of the pre-individual reality, and on the other hand, what individuation makes appear is not only the individual but the individual-milieu pair. [Simondon, 2005, pp. 24-25; personal translation)

In defining the pre-individual as such, Simondon locates individuation as a constant resolution of tensions starting even before the appearance of the individual. The pre-individual is what allows these temporary resolutions of tensions.

From this pre-individual reality, Simondon distinguishes two individuations: the psychic and the collective individuation. Both are simultaneous and reciprocal preventing us from concluding that the psychic individuation as a phenomenon occurs inside the individual and the collective individuation as outside the individual. Instead, the philosopher shows, in his explanations, how these two individuations are constantly developing and completing each other. In the example of Amy's individuation, as portrayed through her narration, it becomes evident that both psychic and collective individuation are intertwined. Amy's relationships, particularly with her mother, play a significant role in shaping her individuation processes. For instance, the experience of immigrating together from China without knowing the language, and Amy's decision to

work in close proximity to her mother's residence, all contribute to her individuation journey in both the psychic and collective dimension.

These two individuations are important for this research as these presuppose that the process of ontogenesis exceeds the limits of our bodies. Relationships between the pre-individual, individuated beings and the collective are made possible through what Simondon defines as affectivities and emotions.

The Role of Affectivity and Emotions in the Individuation

In Simondon's theorization, emotions and affectivities constitute the link between the pre-individual, the individual and the milieu. The philosopher dissociates the two terms. Affectivity operates as exchanges between what remains undetermined, the pre-individual, and what manifests in the present (Tucker, 2021). Emotion modulates affectivity and allows the individual to enter into a relation with the collective. As Ian Tucker (2021) underlines:

Simondon frames emotion as "socialised affect"—because it constitutes the relation a subject has to itself and to others and operates as part of the constitution of psychic individuation. Affectivity cannot be the mediator and mediated—it needs emotion to act as the latter. Emotion operates as an attempt to resolve the tension that is the "affective problem"—namely the initial and persistent incompatibility of the pre-individual and individual that operates as the subject-milieu system. (p. 8)

Conceptualizing affectivity and emotion this way enables the recognition of the permanent relationship and the productive role of the pre-individual, the individual and the collective in individuation, moving us away from any Cartesian rationality and acknowledging the role of affect and emotion in emerging relationships.

This triadic relationship involving the pre-individual, the individual, and the collective in the process of individuation is inherently dynamic and open-ended. It is important to note that it is never completely closed or predetermined but remains receptive to indeterminacies. This recognition challenges the notion of a rigid and predetermined trajectory of individuation, emphasizing the fluid and contingent nature of individual and collective becoming.

In this conceptualization, affectivity and emotion are seen as integral components in the ongoing process of individuation. They are not mere by-products or secondary

aspects but active forces that shape and inform the formation of relationships and the emergence of new subjectivities. By acknowledging the productive role of affectivity and emotion, we can better understand the complexities and nuances involved in the continuous process of individuation.

Taking emotions and affectivities into consideration complexifies the relationship between young people and technical objects: the relation is not only triggered by the rationalization of a need but pervaded and intensified by emotions and affectivities. Emotions and affectivities are present in Amy's words when she mentions her feeling wasting time when she is not able to use her phone and headphones during her transit to work. The intensity of this affectivity triggers an action and her relation to technical objects, such as making sure that her devices are fully charged before taking the train.

In this sense, the expressions of affectivities and emotions are critical to better understand the processes that this research describes. According to Simondon, these emotions are also key to another of his concepts, that of collective individuation.

Collective Individuation and the Transindividual

In his thesis, Gilbert Simondon (2007) explains that the individual is in contact with society only through the mediation of collectives. A collective is not to be confused with communities (Anderson, 2016) in which a sense of belonging is required. In a collective, as Muriel Combes (2013) underlines, there is no immediate or obvious relation existing with the individual. Simondon explains that collective individuation occurring in the present, is active, and the presence of the relation is the most important whereas society is seen as a correlation between the future and the past. In these conditions, the difference between collective and society is temporal: while society considers both the past of the individual and their future, the collective focuses on the present.

This notion of collective emphasizes Simondon's belief that the individual should primarily be understood through their relationships. According to Simondon, the collective is not merely an outcome of a relationship but an active relationship itself, which manifests the process of individuation of the collective.

Simondon argues that the connection between the individual and the group is fundamentally rooted in the simultaneous individuation of both individual beings and the collective as a whole. This perspective highlights the reciprocal and interdependent natures of individual and collective developments. The individuation of individuals and the formation of the collective are intimately intertwined, and they continually shape and influence each other.

The relationship between the individual and the group is not static or predetermined but is constantly evolving. It is grounded in the present moment, emphasizing the importance of presence and the ongoing dynamics of the individuation process. This means that the connections and interactions between individuals and collectives are actively shaping and being shaped in the present context. For example, a collective emerged from the relation Amy and I had while we were volunteering together. It remained as long as we both were active in this relationship, which was meeting together every Saturday to support the program. When Amy decided not to come to in person meetings anymore in the community-setting, this collective ended.

This idea is relevant to this research as participants are part of programs that are designed by community organizations. They rarely know each other prior to the program, but they enter into a productive and active relationship with other individuations in the present such as the one existing between Amy and me. If their backgrounds are different, they may encounter, in their present, similar tensions such as understanding a new society. Collective individuation, in these terms, does not mean that participants will resolve these tensions the same way. Rather, it suggests that these tensions arise in the present moment and trigger a relationship between two individuating individuals or more. For example, in one of the programs I was volunteering in during this research, two participants were in a gap year, between high school and university and were trying to support each other while looking for a job by sharing tips and applying together. This active relationship, which can be temporary, helped them to resolve some tensions arising during this gap year during the COVID-19 pandemic.

Simondon refers to the relation that occurs between one individual and another as the transindividual. This transindividual action is what brings individuals together as elements of a system, encompassing potentials and metastability. "The transindividual does not localize individuals: it makes them coincide; it makes individuals communicate

through meanings: it is the relations of information which are primordial, not the relations of solidarity, of functional differentiation” (Simondon, 2005, p. 294; personal translation).

Simondon's theoretical constructs offer valuable insights into comprehending the process of individuation as an ongoing relationship between psychic and collective individuations within a specific milieu. According to Simondon, individuation goes beyond the confines of the individual and entails a multifaceted interplay between psychic individuation, which refers to internal processes of individual development, and collective individuation, which pertains to external social and cultural factors. This process unfolds within a specific milieu that encompasses both the pre-individual, representing the potentiality of becoming, and the transindividual, which encompasses shared and interconnected aspects.

By employing Simondon's concepts, this research seeks to redefine the nature of the relationship between individuals and technical objects. Instead of solely considering utility or rational purposes, or practices in context, the study recognizes the importance of examining the entangled role of relations, emotions, collectives, and the agencies of technical objects. This perspective acknowledges that the interactions between young people and digital devices are not solely driven by individual needs and goals but are also influenced by broader social and cultural contexts. It emphasizes the significance of understanding how technical objects mediate social interactions, shape emotional experiences, and contribute to the formation of collectives.

Simondon's individuation provides me with a framework to understand the reality of participants as dynamic movements, characterized by tensions and rich potentials, in which their relationships serve as an ongoing, unpredictable, and emergent process of individuation. However, to fully grasp their vibrant and social reality, it is essential to situate these individuals within the broader context of society and the power relationships that shape their experiences. The concept of sociogenic principle, as theorized by Sylvia Wynter (2001), helps to situate each individual and to comprehend how power circulates within society.

The Sociogenic Principle

As seen above, Gilbert Simondon (2007) delineates a temporal difference between the collective that focuses on the present and on a society that considers both

the past and the future: to be socialized, the individual needs to project their future within the existing social network. Theorizing individuation, Simondon focuses mainly on the biological aspect of the process. But, according to Frantz Fanon (2008) and Sylvia Wynter (2001), what it means to be human in a collective is not only a question of biology, of ontogeny or ontogenesis, but rather of the bio and the social, sociogeny. Relying on both Fanon and Wynter, anti-colonial writers and philosophers who reject pre-existing categories such as those of age, gender, and race, enriches the ontogenesis theoretical approach developed above. Sociogeny starts with the axiom that a human is always already a socializing being, always becoming. This starting point is not far from Simondon's collective individuation as the French philosopher theorizes that collective and psychic individuation are interrelated from the start of the process of individuation. However, for anti-colonial theorists, the collective and the psychic, and the milieu must be understood within post-Enlightenment racist and colonial configurations of the Human.

The concept of sociogeny was initiated by Frantz Fanon (2008). Trained as a psychologist, he makes the distinction between "the 'corporeal schema' (the body's implicit knowledge of itself in relation to its milieu) and the 'historico-racial schema' (the meanings of lack attached to Black bodies and of wholeness attached to white bodies in the colonial imagination; the internalization or epidermalization of these meanings)" (Erasmus, 2020, p. 54).

The critical race theorist Sylvia Wynter (2001) expands upon Fanon's insight and provides a valuable sophistication to Simondon's theory of individuation, even though she does not refer to his work. In her reflection about what it is to be human, Wynter defines the human as always hybrid, merging the bios (the living system), and the mythos (the symbolic, 'languaging' being of 'the Word').

The individual perceives and categorizes the world through the lens of their specific cultural system. In sociogeny, the relationship is central, encompassing the geopolitical constitution of social relations and subjectivities. However, what distinguishes this perspective from Simondon's is the consideration of subjectivity. According to Sylvia Wynter, the sociogenic principle explores the interface between the body and the world. Wynter argues that the stories we live by and dream of shape our actions, making 'the human' a set of practices. The sociogenic principle underlies the

narratives that inform our thinking, guide our struggles, and differentiate our lives. It encompasses the resources we utilize as we navigate our lives within configurations of power and at specific historical moments. For instance, when Horgan encourages young people to care for others, he specifically refers to parents and neighbours, highlighting a particular notion of family and community as normative and social foundations in British Columbia. This perception of what it means to be a good child reflects a specific cultural context. However, in other societies, these conceptions of family and community may differ. By examining this perspective through the lens of the sociogenic principle, we can better understand the nuanced power relationships that permeate this particular society.

In Western societies, Sylvia Wynter offers a reading of humanity as representatively linked to the figure of the Man.

[...] the new “idea of order” on whose basis the coloniality of being, enacted by the dynamics of the relation between Man—overrepresented as the generic, ostensibly supracultural human—and its subjugated Human Others (i.e., Indians and Negroes), together with, as Quijano notes, the continuum of new categories of humans (i.e., mestizos and mulattos to which their human/subhuman value difference gave rise), was to be brought into existence as the foundational basis of modernity. (Wynter, 2003, pp. 287-288)

She argues that talking about humans or Man implies a specific Man, the man of Western Europe with its origin in the Renaissance as *homo politicus*. This figure of the man of the Renaissance opens up a slot for a new Man, white, Christian, based on the figure of the Western bourgeoisie’s model of being human, the *homo oeconomicus*. Wynter, in a co-produced interview with Black feminist scholar Katherine McKittrick (2015), explains that these figures of Man suggest a powerful knowledge system and origin stories that explain who and what ‘we’ are.

These systems and stories produce the lived and racialized categories of the rational and irrational, the selected and the dysselected, the haves and the have-nots as asymmetrical naturalized racial-sexual human groupings that are specific to time, place, and personhood yet signal the processes through which the empirical and experiential lives of all humans are increasingly subordinated to a figure that thrives on accumulation (Wynter & McKittrick, 2015, p. 9).

These power relationships need to be acknowledged as they recognize that race is often essentialized or overlooked, as is the case for Simondon, by Western philosophers. As the participants of this research come from different horizons with

diverse backgrounds, understanding the different stories that build and shape all of us is important to escape the trap of a “westernization” of who they are. The sociogenic principle, that we are hybrid, both biology and stories, reminds us that the stories that are shared in this thesis are not free of hierarchy or discrimination. For instance, during a workshop, when Amy recounts the challenges she faced in her first months in British Columbia due to her limited English proficiency, her story underscores how language proficiency delineates the division between the have and the have-not. In the context of sociogeny, her narrative highlights the supremacy of English, creating her as the ‘Other’, thus generating power dynamics. Here, power is not only seen as constraining but also as an active producer of knowledge in society. In this acceptance, stories are not only representative of the world we live in but also make the world.

Furthermore, the sociogenic principle is entangled with other power relationships, such as those defined by Michel Foucault (1979) and influences what is considered as knowledge. Indeed, the French philosopher conceptualizes power not as dwelling in the individual but as in a productive relationship with knowledge. If the sociogenic principle starts from the socialization of a specific individual, Foucault’s theory provides a “top-down” approach to understanding how power circulates in Western society. This conceptualization from the French philosopher has been further updated and expanded by Gilles Deleuze.

In his monograph about Foucault, Gilles Deleuze (1988) unfolds the relationship between power and knowledge, qualifying it as local, dynamic, multiple, and unpredictable. Knowledge is defined as a practical assemblage of what is articulable, like statements or discourses, and what is visible, what is language and what is light. Each twofold assemblage is specific to each context, and each era and, as Sylvia Wynter (2001) would add, is also shaped by the stories shared.

However, according to Deleuze, there is no conjunction between the articulable and the visible: “what we see never lies in what we say” (Deleuze, 1988, p. 64). Knowledge lies between the two, through power relationships. Power relationships render certain things visible and facilitate discourse. Power and knowledge are not opposing forces, but rather a complex nexus that determines the acceptability and functioning of a system or society. Therefore, it becomes crucial to attend to both

discourses, the narratives discussed by Sylvia Wynter, and the processes of visibility and hiding—how and why they occur.

Prominent feminist scholars, such as Donna Haraway (1988), and critical race theorists, like Sylvia Wynter (2001), critique the prevailing notion of knowledge as predominantly Western and white, falsely assumed to be universal and natural. This hypervisibility of Western white perspectives has resulted in the hiding of other knowledges. Donna Haraway argues that knowledge is always situated, contextualized, and plural. This thesis aligns with these ideas by acknowledging the diversity and situatedness of knowledges.

In this section of the chapter, I have proposed that individuals are defined as engaged in a continuous process of individuation, recognizing the importance of relations, movements, and unpredictability within this process. In addition to psychic and collective individuation, which acknowledge the interplay among the pre-individual, individual, transindividual, and the milieu, the sociogenic principle enables the positioning of individuals within dynamic and structuring power relationships.

Acknowledging that individuals and collectives are engaged in continuous processes fueled by tensions and relationships compels us to consider various crucial aspects for the conceptualization of digital literacy. Firstly, it highlights the uniqueness of each process, as they are entangled in distinct relationships. Understanding that digital literacy is not a uniform or static phenomenon prompts us to delve into the intricacies of individual experiences and sociogenic principles. Moreover, it draws attention to the ongoing and pervasive circulation of power within digital literacy practices. Examining power dynamics becomes essential to comprehending how certain voices, perspectives, and values shape the landscape of digital literacy. This necessitates a critical examination of power relations, inequalities, and the potential consequences they may have on individuals and collectives.

Both individuation and the sociogenic principle emphasize that individuals and their stories are shaped by diverse relationships, not only with other individuals but also with objects. To gain a deeper understanding of how these relationships unfold with technical objects, the subsequent section delves into the processes that shape the

formation of what Simondon (1958) defines as technical objects and their social, cultural, and political implications.

2.4. Technical Objects: From an Extension of the Human Body to the Transductive Process of Technicity

The relations between humans and objects are often conceptualized as intimate and based on senses. Robert Innis (1984) for example, explains that “technology, in all its forms and in all its functions, independent of historical periods or a social matrix, is rooted in the general production of exosomatic organs which mediate between the human body and nature” (p. 67). This quote suggests that each technical object is rationally created as an extension to the human body to help the individual achieving their goals. In this relation, the object is defined as inert and at the service of the individual. Daniel Black (2014) relates how the inventors of the phonograph and the typewriter envisioned these technologies modelling them as a function of human organs. Vannevar Bush (1945) did the same when he foresaw the computer as an extension of the brain to stock up and sort the increasing flows of information.

These definitions imply a certain neutrality of the object that is seen as a complement to or an extension of the human being. Donna Haraway (1985) troubles this conception when she affirms that technologies are crucial tools recrafting our bodies. It is not clear, she argues, who makes and who is made in these relations underlining the interdependence between bodies and technologies.

This section of the dissertation aims to insert ontologically technical objects in relation to individuals. As Faulkner and Runde (2019) notice in the introduction of their article, most of the research so far focuses on the human and organizational implication of technology rather than on the devices themselves. Technical objects are not merely a reflection of how we live, but they also actively contribute to shaping how individuals live, think, and behave in society. This assertion moves us away from an instrumental or anthropological definition of technology which considers it as made by humans and as a means to an end for us. For Adrian Mackenzie (2006), relying on Simondon’s vocabulary, “technologies are not a domain exterior to human bodies but are constitutively involved in the ‘bodying-forth’ of limits and difference. Technical materializations are always involved in what we take to be a living, human body” (p.52).

Mackenzie thus complexifies our understanding of the relationship between bodies and technologies. Building upon the insights of both Haraway and Mackenzie, this section argues that technical objects encompass more than mere extensions of human bodies; they also embody values and fulfill a range of functions, including social, cultural, and political roles. Consequently, these technical objects play a part in our individuation processes. To explore this perspective further, it is necessary to trace the origins of technical objects and delve into what Gilbert Simondon (1958) refers to as their "technicity."

2.4.1. The Genesis of Technical Objects

In defining digital devices and applications, I draw upon Simondon's concept of the technical object and extend its applicability to the digital realm. Other scholars, including Faulkner and Runde (2019) and Yuk Hui (2016), have made efforts to conceptualize the specific characteristics of digital objects. Yuk Hui (2016) explains "by digital objects, I mean objects that take shape on a screen or hide in the back end of a computer program, composed of data and metadata regulated by structures or schemas" (p. 1). Faulkner and Runde (2019) also base their definition of digital object as objects including one or more bitstrings. While these definitions acknowledge the existence of data and lines of code as constituents of digital objects, they may overlook other aspects, such as the materiality of these objects.

Simondon's conceptualization, which recognizes both the materiality of these devices and other elements such as pieces of code, provides a comprehensive and valuable understanding of objects as dynamic processes. This approach avoids delineating digital objects based on a priori specificities that would set them apart from other technical objects. Nonetheless, building upon Simondon's definition of technical objects and deliberately keeping the initial definition broad, this research aims to explore and analyze the nature of digital objects. By adopting a comprehensive approach, it becomes possible to examine the various aspects that contribute to the constitution of a digital object.

Gilbert Simondon (1958) starts the second part of his doctoral thesis by deploring that technical objects are yet to be inserted into Culture that he defines as a world of meaning which functions as a regulator in society. Worse, "Culture is constituted as a

system of defense against techniques; but this defense is presented as a defense of Man assuming that technical objects do not contain human reality” (Simondon, 1958, p. 9, personal translation). In this sense, he suggests not only considering technical objects as functional, but also as expressions of knowledge and values with their own modes of existence.

For Simondon, the technical object is the temporary result of a process. For example, a smartphone is considered as the latest version of the evolution of the phone which becomes increasingly consistent with its milieu. In the case of Amy, she says that she uses her phone to communicate but also to get informed and to be entertained. For instance, the functions Amy refers to were not envisioned at the start of the evolution of the phone. They appear progressively as the phone technology evolves, which is nowadays mobile for example, to its specific milieu.

Simondon refers to the process of adjustment to the milieu as concretization. During the initial stages of this process, individual elements of the technical object may not be fully compatible with one another, resulting in potential incompatibilities. However, as the process unfolds, subsequent phases of the technical object work toward enhancing the convergence between the object and the milieu in which it operates. Put another way, Simondon emphasizes that each technical object is closely aligned with a specific collective or society. For example, in the introduction, Amy explains that at university, while she used to take her notes on paper with a pen, she is now using an application that allows her easily to bring everything she needs through her iPad with no risk of losing a written note: “I used to take notes on paper, but I was wasting so much paper and it’s so heavy that I just bought an app called Notability on the iPad and I take all my notes on there and it syncs to Google Drive, so I never have to worry about losing my notes” (Amy).

Simondon adds another criterion for the concretization of a technical object: if the concretized object is internally consistent, it must be open to some *margin of indeterminacy*. This margin allows the technical object to interact either with other technical objects or with individuals. If we consider the example of the phone and its latest evolution, the smartphone, we can identify multiple margins of indeterminacy. These include the applications that are installed or not by each smartphone owner, which determine the phone's ability to interact with other technical objects, as well as the

unique ways in which each user utilizes their smartphone. These margins of indeterminacy are enabled by the internal consistency of the technical object which can now cope with this kind of ‘openness.’

The margins of indeterminacy allow the technical object to enter in relation with other technical objects or individuals. Amy’s phone for example is not the same as someone else’s phone as the relations that shape Amy and the technical object are not the same. This ability to entail some margin of indeterminacies without taking the risk of falling apart, confers to technical objects the ability to shape civilization. Consequently, this is not the object that is made according to its expected usages but the usages adjusting to the object, such as watching videos on a small screen phone or checking a heart rate on a watch.

In this sense, the focus and the function of the technical object needs to be analyzed through the different processes, individuation and concretization within a specific milieu, and the relations that it has with other objects or individuals.

2.4.2. Transductive Technicity

When Gilbert Simondon (1958) defines technical objects as bearers of values, he is one of the rare scholars to acknowledge their role in the Culture of a society. Several decades later, Bruno Latour (1990) articulates the same point when mentioning that the main difficulty of integrating technology into social theory is the lack of narrative resources (p.111). In other words, both Simondon and Latour argue for a genealogy of the technical object acknowledging their narratives as well as their past and ongoing productive relations with collectives. In this context, the technical object encompasses not only technical aspects but also social, cultural, and even political dimensions.

Simondon (1958) suggests another layer to the technical object that he calls *Technicity*, defining it as the mode of relation between individuals and the world: “Actually, to be fairly recognized, according to its essence, and rightly integrated into the culture, technicity needs to be recognized within its relation to other modes of being of the human’s world” (Simondon, 1958, p. 152; personal translation). Consequently, technicity encompasses not only values and potentials, but also the normativity of technical objects.

Technicity exists in technical objects and spreads transductively at the intersection of diverse realities including corporeal, geographical, economic, conceptual, biopolitical, geopolitical and affective dimensions. Côté and Pybus (2016) underline: “Any given technical object – for example, a mobile application – functions to interlace social, political, economic, and cultural dimensions. As such, technicity is crucial for a rigorous understanding of the possibilities of collective life – the political task par excellence” (pp. 86-87).

Pursuing this line of thought, the concretization of the technical object would align with the evolution of technicity, which, in turn, mirrors the progression of the social, political, and cultural dimensions of collective life. In these conditions, what Amy is doing with her phone when she listens to podcasts or with her tablet when she takes notes is not only significant on an individual level but also encompasses various social, cultural, political dimensions that cannot be isolated from the milieu she lives in.

Some of the latest investigations such as the ones led by Patrice Flichy (2007), Safiya Noble (2018), and Ruha Benjamin (2019) show how knowledges and cultures and today’s designers of digital technologies are embedded and active in the technical objects they create.

The sociologist, Patrice Flichy (2007) explains that from the start, what he calls “the imaginary of the internet” is rooted in technics as much as in the social organization. This requires us to question the intended uses of what was created for the network. For example, at first, the internet was mainly envisioned by the American counter-culture movement as a tool of exchanges and cooperation (Turner, 2006). But as Flichy reminds us, these representations are developed within homogeneous social groups (for example, white men from university, counterculture).

Recently, the sociologist of race and gender, Safiya Noble (2018) writes how discrimination is present in the use of technology and wonders what values are prioritized in these systems:

On the Internet and in our everyday uses of technology, discrimination is also embedded in computer code and, increasingly, in artificial intelligence technologies that we are reliant on, by choice or not. (p. 1)

As Flichy (2007) and Noble (2018) underline, among others, if technical objects are programmed to carry out tasks, both they and their designers are guided by some purpose or intention. These purposes and intentions pervade in code written by the developers of these machines, and which are then executed by the machine, though not always in ways that are predictable. Code can be seen as the law (Lessig, 2000) of the functioning of the technical object. The cultural norms and practices of programmers – who are drawn from a narrow racial, gender, and classed demographic – are coded into technical systems. Donna Haraway’s (2013) classic *Simians, Cyborgs and Women* narrates the blurred boundary between organisms and machines, describing how myth and tool mutually constitute each other. She warns that “as we think about coded inequity and discriminatory design, it is vital to question which humans are prioritized in the process” (p.116).

In other words, as described above, Sylvia Wynter and Katherine McKittrick (2015) acknowledges the human as a hybrid of *bios* and *myth*. Similarly, this notion applies to the technical object, as defined by Simondon (1958). Dixon-Román and Parisi (2020) elaborate: “the sociogenic code permeates not just human ontologies but also more-than-human ontologies including the sociotechnical assemblages of data and algorithms (Dixon-Román, 2016)” (p.118).

Nonetheless, these technical objects and their uses embrace several paradoxes. While platforms like Twitter, Instagram, and YouTube, provide their subscribers with ample opportunities to put blatant acts of racism on trial, many of these same companies encode more insidious forms of inequity in the very design of their products and services. For example, Sophie Bishop (2018) relates how YouTube algorithms hid some videos tagged or titled with LGBTQ keywords, such as ‘lesbian’, ‘gay’ or ‘LGBT’ when the filter ‘restricted view’ supposedly protecting users to access what the platform describes as ‘potentially offensive content’, is activated.

Resisting techno-deterministic lenses, this study analyzes how these technicities shape practices from the participants’ perspectives, to understand how individual and technical objects *become* in these processes.

Considering digital devices and applications as technical objects, which bear values and possess technicity, has profound implications for the conceptualization of

digital literacy. Moving forward, it is crucial to pay attention to three key aspects. The first aspect is the ongoing process of concretization, facilitated and initiated by tensions and relationships, similar to the process of individuation. The second entails recognizing the technical object as a carrier of values. As we have seen previously, these values can be embedded in the object by its designers. However, they can also be influenced by the individual in relation to the technical object. The third and final aspect pertains to the technicity of technical objects. It allows us to situate each technical object in relation to the social, cultural, and political dimensions of the society in which it is utilized.

2.5. Moving Toward a Relational Ontology

Thinking with the constructs of individuation, sociogenic principles, technical objects and technicity involves considering relations between individual and technical object as a focus of the analysis. Gilbert Simondon (2005) defines relation as the “reciprocal regime of information and causality exchange of an individuating system” (p.304; personal translation). In these conditions, relations are seen as productive, reciprocal, and shaping each individuating and/or concretizing element in these exchanges. In other words, the focus might not be only on what emerges from this relation but also on what the individuating elements become.

In *A thousand plateaus*, Deleuze and Guattari (1988) often use the term becoming linked to another name, like becoming-animal, but never define exactly what is becoming. Rather, they write about what becoming is not. “A becoming is not a correspondence between relations. But neither is it a resemblance, an imitation, or, at the limit, an identification” (Deleuze & Guattari, 1988, p. 237). “Above all, becoming does not occur in the imagination” or “Becoming produces nothing other than itself. We fall into a false alternative if we say that you either imitate or you are. What is real is the becoming itself” (p. 238), or even:

Becoming is certainly not imitating or identifying with something; neither is it regressing-progressing; neither is it corresponding, establishing corresponding relations; neither is it producing, producing a filiation or producing through filiation. Becoming is a verb with a consistency all its own; it does not reduce to, or lead back to, appearing (Deleuze & Guattari, 1988, p. 239).

Other authors have employed the concept of becoming to theorize the way elements of the world come together and undergo transformation (Fleming et al., 2018). They view becoming as a fluid process of interactions and transformations that destabilize rigid structures, revealing the unpredictable reality of an ever-changing world (Vasilopoulos & Bangou, 2015). Elizabeth Grosz (2005) underlines that “each object is more than itself, contains within itself the material potential to be otherwise and to link and create a continuity with the durational whole that marks each living being” (Grosz, 2005, p. 8).

This perspective encourages us to establish connections not only between humans but also between the more-than-human, nature, culture, and other elements. It recognizes that all entities involved in a given situation possess potential agency. Going further and reaffirming the relationships of power with the process of becoming, Todd May (2003) suggests that it undermines:

(...) the stable identities given to us by the majority culture as the framework within which our world is to be understood and acted upon. In undermining stable identities, becomings do not substitute other stable identities or fixed terms for the abandoned ones. (May, 2003, p. 150)

So, relying on these definitions, becoming- is a productive and unpredictable encounter. In these conditions, the transformation becomes the interest this study focuses on. This construct is important because it brings, once again, the idea of unpredictability, and uncertainty, against the research of predictable patterns in entities.

Following this idea, the focus of this research is then not only on Amy as an individual or on the podcast as a technical object she listens to during transit but also on the relationship created, regarding among others, affectivities and emotions (feeling bored or entertained). In these generative relationships, neither Amy nor the podcasts remain the same. Indeed, these affectivities would trigger the becoming of Amy (affecting what she might do next) and of the podcasts (will it be listened to again, unlisted, and what data might emerge from these relations...).

2.6. Thinking with theories

Thinking with these theories and this relational ontology enable a refinement and the emergence of new research questions. Instead of considering individuals and

technical objects as stable entities, this research embraces the notion of individuation and the sociogenic principle, which highlight the continuous entanglement of individuals and technical objects in dynamic and unpredictable processes. Therefore, this research aims to investigate the ongoing processes at play and their outcomes. Specifically, it seeks to answer the questions: What are the ongoing processes in action, and what do they ultimately become? For example, instead of asking how do young people and technical objects experience each other, this research asks what do relations between technical objects and individuals enable as becoming?

Technicity explains that all dimensions of society are impacted by technical objects, requiring that we examine not only what is at stake between individuating individuals and concretizing technical objects but also what is transductively spread collectively, socially, culturally, and politically. Moreover, in this transduction what is left aside is also of interest: which stories are shared? Which ones remain silent?

Getting a better understanding of these processes, their entanglements and their becomings is critical suggesting new approaches of digital literacies.

2.7. Conclusion

This chapter originates from the concept of a flat ontology to revisit and solidify the theoretical understandings of the research participants, encompassing both individuals and technical objects. Despite their distinct nature, these entities exhibit notable similarities. Each is initiated by processes that acknowledge the significance of the relations they establish with one another to address tensions. Moreover, they embrace the notion of openness to uncertainty and unpredictability, rejecting deterministic assumptions and fostering their potential for growth.

To explore the interconnections and potential of individuals and technical objects, this thesis adopts a relational ontology as its analytical framework. This perspective enables not only the analysis of these entities but also the examination of the emergent properties that arise from their relations and the transformations they undergo through their interactions.

A relational ontology views entities as interconnected and in a continuous state of evolution, rather than existing independently or in fixed states. It emphasizes the

importance of relational dynamics that shape these entities. By employing this approach, this thesis aims to unravel the intricate entanglements and emergent phenomena that arise from the interactions between individuals and technical objects.

Furthermore, the relational ontology employed in this thesis acknowledges the agency of both individuals and technical objects in shaping their relationships and co-evolution. This perspective recognizes that these entities are not passive actors but actively participate in influencing and shaping each other's development and outcomes. It also acknowledges that the interactions and interdependencies between individuals and technical objects occur within broader social and environmental contexts, which further influence and shape their dynamics.

By adopting a relational ontology to examine digital literacies, the focus of this thesis expands beyond solely examining individuals or technical objects in isolation. Instead, it emphasizes the multifaceted relationships that emerge and evolve between them. This approach recognizes that these relationships have the potential to generate new possibilities and transformations, highlighting the complex and dynamic nature of digital literacies. By studying these relational dynamics, this thesis aims to provide a comprehensive understanding of how individuals and technical objects co-construct and co-shape each other, leading to new emergent forms of digital literacy.

Chapter 3. Becoming-Methods: Capturing the Different Processes in Action

3.1. Introduction

As Noah Golden (2017) contends, little research has been done to introduce a discourse on nuanced ethnographies of individuals' digital literacy practices and more expansive analyzes of the socio-political dimensions of digital technologies. I hope that the theoretical concepts that were detailed in the previous chapter may contribute to addressing this gap, by studying how individuating individuals and concretizing technical objects become through their relations, and how technicity spreads transductively in several dimensions. These constructs, along with the involved relational ontology, need to be articulated in a specific manner. They require a particular stance and reading of becoming, which this thesis seeks to explore and elucidate. As Karen Barad (2003) contends:

Practices of knowing and being are not isolatable, but rather they are mutually implicated. We do not obtain knowledge by standing outside of the world; we know because “we” are of the world. We are part of the world in its differential becoming. The separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse. (p. 829)

In this excerpt, Karen Barad bridges ontological, epistemological and ethical stances, considering the position and agency of all actors involved, including the researcher. Indeed, conceiving individuals and technical objects as becomings-in-relation has various implications for the three methods I engage in this study, those of the interview, observation, and technical object “walkthroughs”. As Barad underlines, there is a requirement for ethical consistency between what the research claims to be and how the study unfolds.

Given the interconnection between theories, methods, ethics and the researcher, this chapter introduces three concepts that guide the study and which emerge from the relational ontology introduced in the previous chapter. Specifically, the methodology aims to capture the distinctiveness of each process and relationship, to observe and analyze them in the present moment, and to encompass multiple dimensions in how

they unfold. Following the elucidation of these three principles and their relevance to this study, the subsequent sections delve into the specific methods employed and provide a detailed account of their application in the field.

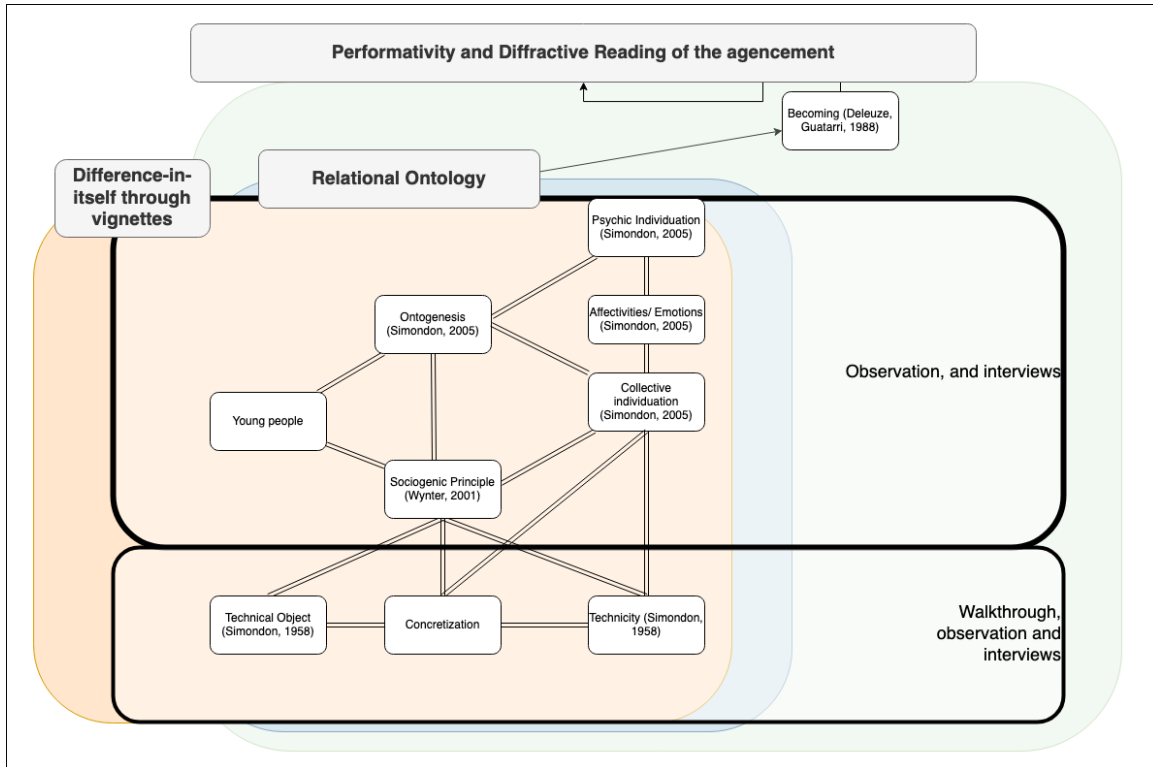


Figure 2: Mapping the theoretical and methodological imbrications of this thesis.

3.2. Capturing Specificities and the Multidimensionality of Each Process in the Present Moment

This section details three principles guiding my approach to observation, interviews, and walkthroughs, in relation to the relational ontology developed in the previous chapter.

The first principle, as articulated by Deleuze (2011), emphasizes the importance of attending to the *difference-in-itself* during observation and interviews. This approach directs the focus toward each individual process and emerging relation, discouraging any potential comparisons among them. The second principle considers the *performativity* of these processes and relations occurring in the present moment. The

third principle involves *diffractive reading*, enabling an analysis that acknowledges the multiplicity of readings and dimensions covered by this research.

3.2.1. Differences that Matter

As the relational ontology suggests, this research is concerned with both the being and the becoming of the different processes of individuation, concretization and the sociogenic principle, in the present moment. By recognizing the uniqueness inherent in these processes, this study avoids any attempts to compare or hierarchize participants or their digital literacy practices.

In his opus, *Difference and Repetition*, Gilles Deleuze (2011) develops a theory of difference that applies to both human and more-than-human matter. He critiques the concept of difference as a distinction "between" two items and points to difference at an ontological level. Only through an observer's representation can two things be compared. Instead, he argues for a "difference-in-itself" that does not need to be in a comparative relation to exist. For Deleuze, difference is not relative to identity but constitutive to being, or rather to becoming. To help illustrate this point, he uses the following example: "...a temperature is not composed of other temperatures, or a speed of other speeds, ...[rather]...each temperature is already a difference, and [those] differences are not composed of differences of the same order but implies a series of heterogeneous terms" (Deleuze, 2011, p. 237, personal translation). This example demonstrates that a temperature retains its intrinsic nature regardless of the existence of other temperatures for comparison. It is a difference in itself, independent of any external points of reference.

In both the philosophies of Gilles Deleuze and Gilbert Simondon, the notions of stability and fixity are rejected. Instead, they emphasize the idea that everything is in a constant state of change and movement. According to them, *difference-in-itself* permeates all aspects of existence.

When we engage in thinking, according to Deleuze (2011), we often repeat and represent ideas in our minds. However, this act of repetition is not a mere duplication or replication. Instead, each repetition generates something new and unique. In every act of repetition, there are inherent differences that give rise to novelty and new possibilities.

Deleuze's conceptualization of difference proves particularly compelling in the context of this study. He sees difference as a positive concept, distinct from the conventional understanding of difference as a means of comparison, discrimination, or separation. Instead, difference-in-itself is viewed as a continuous process, a multiplicity that is constantly evolving. It is an ongoing becoming, where each element and its transformation depend on the multiple connections they establish within their specific environments. Indeed, Deleuze, like Bruno Latour (2005) or Karen Barad (2006), does not conceptualize difference in isolation but as entangled in a network of relations.

This shift in how difference is conceptualized is of critical importance as Cockayne et al. (2017) explain:

Our assumptions about difference play a large role in how we analyze, apprehend, and critique the world we observe, as well as in our ability to imagine and enact alternatives to the often daunting assumption that 'what is' is also 'what should be' (p. 580).

Envisioning reality within difference and through relationality entails shifting the focus away from specific and individual skills and competencies, as is often the focus on conventional digital literacies frameworks. Instead, the emphasis lies on the emerging "complementarity" and relational agencies that arise from the interactions between individuals and technical objects.

Considering difference-in-itself is useful in this study which does not aim to compare any individuation or concretization. Instead, the study aims to recognize the trajectories and tensions inherent in these instances, how they are entangled within their relationships, and explores how these tensions arise and are resolved. All the participants in this research are different in themselves and considered unique. The goal of this research is then not to compare or categorize them but to examine how their individuation or concretization processes enter into relation and what becomes from these relations. However, not comparing or categorizing participants can be tricky when the same interview guideline or observation grid is used in discussion with or observation of participants. This research has relied on an interview guideline as described below, with the intention of it not being a constraint but rather an orientation. This was particularly salient when participants showed me videos or talked about past experiences of discrimination. In these cases, I let them share and followed up with additional questions that emerged in the conversation. In these moments, I also took into

consideration that these becoming-topics arose from the relations that both each participant and I, among others, created at this moment. In these conditions, any comparison of process per se was impossible as I shared a unique relation with each of the participants.

Recognizing the uniqueness of each process and relationship in action is essential for conducting meaningful observations and interviews. To effectively observe and understand the inherent differences within these processes as they unfold in the present moment, it is necessary to employ methods that transcend mere representation and, instead, embrace the performativity of these ongoing actions.

3.2.2. Performativity

As outlined in the preceding chapter, this research seeks to attend to processes unfolding in the present moment. Adopting this perspective entails a departure from the use of representation, which can be viewed as a means of stabilizing the social order. Instead, the research employs methods informed by a performative lens, which facilitates the identification of relationships as they manifest dynamically in the present moment.

The first part of this section explores the necessity of moving away from representation to better understand the dynamic nature of processes during observations or interviews. The second part explains performativity as it is used in this research.

Researching Without Representation

To explain the move from representation to performativity, Judith Butler (2006) investigating gender, notes that representation is always ambiguous:

On the one hand, representation serves as the operative term within a political process that seeks to extend visibility and legitimacy to women as political subjects; on the other hand, representation is the normative function of a language which is said either to reveal or to distort what is assumed to be true about the category of women (p. 2).

In this quote, they make the explicit link between representation, language, and truth. In John Horgan's discourse, for example, the BC Premier describes a representation of

who he calls 'young people'. Categorizing subjects both universalizes and unifies them. In other words, representation organizes and stabilizes society. For Gilles Deleuze (2011) representational thought is 'sedentary,' categorical and judgmental. It is the enemy of difference, movement, change and the emergence of the new (MacLure, 2013a).

For whomever is interested in studying the flow, the movement, the unpredictable and tries to embrace what Latour (2005) calls the "messiness of the social," moving away from representation is needed. Karen Barad (2003) explains that representation is based on the ontological distinction between representations and what they are supposed to represent. It separates the world into words and things, distancing the researcher or the knower and the activity (Leander & Boldt, 2013).

To move beyond representations and what they are supposed to represent, this research adopts a performative sensibility that focuses on the dynamic processes of change and transformation. Specifically, it seeks to explore the differences-in-themselves and the various ways in which they evolve and transform moment-by-moment (Leander & Boldt, 2013). By doing so, the study hopes to shed light on the ongoing and emerging becomings and provide a more nuanced understanding of their complex and dynamic relationships.

Performativity of this Research

Representational logic is pervasive in topics surrounding individuals, digital technologies, and COVID-19. In recognizing the inherent power of representation and by adopting a performative stance, this research strives to analyze these topics as processes rather than fixed subjects. Rather than studying who and what they are, performativity focuses on what they do and become together, and what these relations generate.

To define performativity, Judith Butler (2006) relies on Michel Foucault (1979). In *Discipline and Punish*, Foucault contends that disciplinary practices through laws and discourses produce specific bodies. As an example, when it comes to prisoners, the strategy involves not only making their bodies symbolize the prohibitive law but also compels them to behave as prisoners. Consequently, prisoners' bodies perform their confinement. Judith Butler (2006) then explains that bodies have no ontological status

apart from the various acts which constitute their reality. Thereby, writing about sexuality and gender, Butler blurs the boundaries between the inside and the outside of bodies:

In other words, acts and gestures, articulated and enacted desires create the illusion of an interior and organizing gender core, an illusion discursively maintained for the purposes of the regulation of sexuality within the obligatory frame of reproductive heterosexuality. If the “cause” of desire, gesture, and act can be localized within the “self” of the actor, then the political regulations and disciplinary practices which produce that ostensibly coherent gender are effectively displaced from view. (pp. 185-186)

According to Butler (2006), the ontology of the doer is constructed in and through the deed (p.195). Butler also contends that both the doer and the deed co-produce each other, and that the doer does not precede the deed. This is precisely where performativity is different from performance because performativity means that this act, this deed, generates effects and is not only a result of causalities.

Another dimension as defined by Judith Butler would be the repetition of these acts that frame performativity. To be performative, in Butler’s theory, a deed must be repeated. But these repetitions are never meant to be perfect and variation matters. In this sense, using a performative lens is not contradictory with difference-in-itself as theorized by Gilles Deleuze (2011). In *Gender Trouble* (2006), Butler discusses these repetitions that can be seen as “failed copy” (p. 270) and notes that it is through such ‘failings’ that emerge a potential for change.

Karen Barad (2006) reaffirms Butler's insight that both the agents responsible for actions ('doers') and the actions themselves ('deeds') are coproduced and performative. They further extend it to both humans and more-than-humans. This perspective enables a detailed examination of the actions and the knowledge they produce, shedding light on the current occurrences and the material-discursive forces at play, as described by Karen Barad (2003).

Moreover, by blurring the boundaries between the internal and external aspects of individuals or technical objects, employing a performative lens enables the tracing of the productive nature of affectivities and emotions, as defined by Gilbert Simondon, or the values embedded within technical objects. Emotions and affectivities play a significant role in individuation. Utilizing a performative lens allows this research to

observe these processes in action. Throughout the extensive hours of observation conducted for this research, it was not uncommon for individuals to express their emotions visually or verbally when interacting with technical objects, such as smiling upon receiving a text message or quickly leaving the room to answer or make a call. These observations of how emotions unfold are far from trivial or transitive; they contribute to a better understanding of the relations of the body and performativity in these encounters.

Performativity emphasizes the importance of understanding, thinking, observing, and theorizing as active practices that engage with and are integral to the world in which we exist (Barad, 2006). Using a performative approach allows researchers, as Fenwick and Edwards (2013) suggest, to treat the social as *an effect* of sociomaterial practices. Law and Urry (2004) following Latour, go even deeper contending that social sciences are themselves performative, constructing realities.

Of course, this affirmation has several implications for knowledge-making: where is knowledge located? From where does it flow? Is it situated and local? What does local mean when discussing digital technologies? Recalling Barad (2006), “We don’t obtain knowledge by standing outside the world; we know because we are of the world. We are part of the world and its differential becoming” (p. 185). In other words, performativity calls for a recognition of “situated knowledges” (Haraway, 1988) which are partial, embodied, and diverse. We know because we are part of the phenomenon we want to document.

Performativity focuses on what is happening now in this precise location and on what is produced at the moment. That said, there is no “now” innocent of history, and no “local” fully exempt from global flows of people, material, and resources. As Karen Barad (2003) contends, “the move toward performative alternatives to representationalism shifts the focus from questions of correspondence between descriptions and reality (e.g., do they mirror nature or culture?) to matters of practices, doings, and actions” (p. 135).

While this research acknowledges the productivity of the relationships there is also a need to recognize that the methods used in this study are always, as knowledge, partial and located. In this sense, there is a need to clearly delineate what is observed and how it is observed.

For this, I turn to the concept of agencement developed by Gilles Deleuze and Felix Guattari in French, even if the English translation, 'assemblage', exists in the scientific literature. Francis Bangou (2013) explains that:

(...) an agencement refers to the arrangement of various elements that were not necessarily meant to be put together in the first place but that, when arranged, somehow constitute a functioning whole (that is, they create new knowledge). Although affected by its components, an agencement is, by nature, unpredictable. It is not created according to specific linear instructions, and therefore takes on a certain temporality. (p. 146)

Agencement encompasses the different elements taken into consideration, including humans, and technical objects but also affectivities, emotions and other materials that contribute to the production and sometimes constraints of agency of each element.

Using agencement as a method of this study enables us to define what will be under scrutiny in the observation, the interview, or during the walkthrough. As a result, delineating the agencement forces us to consider what will not be taken into consideration whether by the participant or by the researcher. Detailing the agencement therefore comes down to specifying which relationships our attention will be focused on. As Leander and Boldt (2013) insist, "It is important for our argument to assert that it matters not only where we look but also when we look where" (p. 27).

Using a performative lens and seeing how the phenomena unfold moment-by-moment, Kevin Leander and Gail Boldt (2013) draw attention to the key contributions made by all the actors and their relations at play at this precise moment in this specific agencement.

Rather than conceiving of their activity as primarily about creating a means of identification for themselves or providing a reading of identity for others, we work to reassert the sensations and movements of the body in the moment-by-moment unfolding or emergence of activity. Rather than naming preferred outcomes, we follow the emergence of activity, including the relations among texts and bodies in activity and the affective intensities of these relations. (p.34)

When taking notes during my observations, I strived to track the movements of humans and more-than-humans moment-by-moment, to try to capture the flows when they happened. Observations in the moment-by-moment focus on the present and the potential becomings.

It's crucial to recognize that the very act of documenting observations can be viewed as a moment when we essentially freeze phenomena in time. It's impossible to capture every aspect of something in constant motion, and acknowledging this limitation is paramount. As Bodén (2015) argues, "The cuts or demarcations can never be determined before the research process begins but have to be treated as a temporary practice defined and created within the methodological and analytical work" (p. 195). This freezing or demarcation process creates a sense of determinacy within the inherent indeterminacy of the phenomena as we write about them. Locating this research in a relational ontology defined by the difference-itself and performativity also suggests a different reading of the knowledge circulating and emerging from this research. This is my third principle, what Karen Barad (2006) calls diffractive reading.

3.2.3. A Diffractive Reading

The third principle relates more precisely to the analysis of the performative differences observed. To read what is produced in these relations and the effects of difference, Karen Barad (2006, 2014) suggests using what they call diffraction.

Simply stated, diffraction has to do with the way waves combine when they overlap and the apparent bending and spreading of waves that occurs when waves encounter an obstruction. Diffraction can occur with any kind of wave: for example, water waves, sound waves, and light waves all exhibit diffraction under the right conditions (Barad, 2006, p. 74).

Adopting a diffractive reading means perceiving these "waves" as flows, and energies and not as separate and motionless points in the space. Consequently, the analysis involves the intensity, and forces of these flows. It also opens a discussion on different theories and different disciplinary practices. By doing this and having multiple lenses, it blurs the boundaries between the knower, the known, the subject, the object, nature, culture...and permits an analysis of what they produce together. It consequently enables the consideration of some different situated knowledges:

(...) the knowing self is partial in all its guises, never finished, whole, simply there and original; it is always constructed and stitched together imperfectly, and therefore able to join with another, to see together without claiming to be another. Here is the promise of objectivity: a scientific knower seeks the subject position, not of identity, but of objectivity, that is, partial connection. (Haraway, 1988, p. 586).

Reading diffractively can be seen as connecting different knowledges and looking for their productive differences. As Bronwyn Davies (2014) suggests, a diffractive approach implies that the researcher does not know in advance what knowledge will emerge from the phenomena. It also opens a transdisciplinary engagement by trying to initiate discussion on these different theories such as, for example, the ones used in Education, Communication or even Social Geography. These disciplines, among others, allow us to ask different questions about Amy and her relations with technical objects such as what do the participants, individuals, and technical objects, learn about each other in this relation? What are the social, cultural or political dimensions of these relationships? What becoming does that enable? As Karen Barad (2014) explains:

What often appears as separate entities (and separate sets of concerns) with sharp edges does not actually entail a relation of absolute exteriority at all. Like the diffraction patterns illuminating the indefinite nature of boundaries—displaying shadows in “light” regions and bright spots in “dark” regions—the relation of the social and the scientific is a relation of “exteriority within. (p. 803)

The diffractive reading is helpful to examine the multiple dimensions of the becoming- phenomenon, or the transductive technicity of our society to use Simondon’s terms.

This section aims to clarify how the relational ontology developed in the previous chapter informs the position and unfolding of this study on the field. By escaping any generalization or substantialization of individuals and technical objects, it invites us to focus on each process as different-in-itself and on the performativity of each actor and their relation. Additionally, the multiplicity of dimensions of these processes and relations will be read diffractively.

As seen in this section, all three principles—difference-in-itself, performativity, and diffractive reading—position the researcher as an active participant in the phenomenon I aim to better understand and underline the need to acknowledge not only my position but also my individuation as a becoming-researcher.

3.2.4. Position and Individuation

Using a relational ontology entails recognizing that everything is interconnected and exists in relation to one another, in attending to the ongoing processes of becoming.

In such conditions, the researcher is never detached or external to the reality they are describing.

This section analyzes my position as a "participant-researcher" and highlights several elements of my individuation that have influenced and informed the approach.

Position

At the beginning of this research, I described the project to my supervisor as aiming to be "useful" not only for me, but also for the organization I was about to work with and for the participants. While acknowledging my role and responsibility, I also understand that I am not the only one engaged in this production of realities and, consequently, that I am not in total control of the inputs and outputs of this research, let alone the usefulness of it.

When negotiating the field, I was deeply concerned about being an outsider in these different settings: I am a 40-year-old white woman, originating from a European country. In these settings, my being highlights some elements that are perceived as positions of power: I am a white privileged adult. Even my role as a volunteer in the different programs, initially intended to mitigate these power dynamics, afforded me a distinct status that could never be equal to that of other participants.

These are attributes that I cannot erase. Rather than essentializing race, gender, and adulthood, in what follows I consider how my individuation is different-in-itself, and how it informs dynamically my subjectivity.

When they talk about how the researcher positions themselves and they are positioned, Karen Barad (2003) explains that this concept cannot be ideational or essentialized but is a specific physical arrangement.

For example, the notion of "position" cannot be presumed to be a well-defined abstract concept, nor can it be presumed to be an inherent attribute of independently existing objects. Rather, "position" only has meaning when a rigid apparatus with fixed parts is used (e.g., a ruler is nailed to a fixed table in the laboratory, thereby establishing a fixed frame of reference for specifying "position"). And furthermore, any measurement of "position" using this apparatus cannot be attributed to some abstract independently existing "object" but rather is a property of the phenomenon—the inseparability of "observed object" and "agencies of observation". (p. 814)

Here again, the position is considered as relational within the agencement. Indeed, when observing and interviewing participants, various forces became entangled, involving both human bodies (the facilitator, the volunteers, the present participants, the absent participants) and more-than-human bodies (the chairs, the tables, the technical objects, the computers, boards) as well as different discourses which allowed or prevented what could be said. In each configuration, I was acting as a volunteer, actively engaging in the activities. That also meant that I was neither an educator nor a participant, blurring the boundaries in both cases.

As the researcher and writer of this thesis, I acknowledge that documenting events on paper brings a substantial transformation of the original occurrences. In the context of submitting a Ph.D. thesis, which requires expressing my understanding of what transpired, I embrace the inherent unpredictability of the research process and the potential for new inquiries and alternative viewpoints to surface. By actively engaging with the unfolding nature of research and the inherent possibilities of exploration, I aspire to uncover additional questions and potentially discover alternative perspectives that can enrich my understanding.

As Neil Selwyn (2012) acknowledges, the role of the researcher, how they frame their questions, and what they believe in play a critical role in the analysis. In what follows, I delve into elements of my individuation and sociogenic principles to position myself in this study. By acknowledging these relations that have contributed to my individuation, it becomes evident how this research, from its design to the final thesis, is shaped by these performative forces. Various factors such as popular education, academia, race, and gender have all influenced my work on this research. While the list I address here is not exhaustive, it serves to recognize some of the power relationships that have been triggered by my position.

Elements of individuation

After my first academic experience as a student, I was hired by the French government to help reduce the digital divide among the population of a city (12,000 inhabitants). I was then trained as an educator and worked in popular education for twelve years. Even though I worked with a wide variety of the public, I carried out several projects with adolescents and digital technologies to bring awareness and education to young people, parents, adults and other educators.

Popular education significantly influenced my individuation, shaping my values of equity and emancipation as the core of my work. It has also influenced my previous role as educator as someone who designed, facilitated, and evaluated learning experiences for young people with clear instructional objectives in mind. I aimed to guide individuals in the “thoughtful” use of technical objects and to advocate strongly for out-of-school education. This is primarily why, at the outset, I chose to engage with community service providers rather than school boards for the ethnographic portion of this research. My interest in young people is also rooted in a perspective that often views them as ‘young people of today, adults/citizens of tomorrow.’ Ultimately, my relationship with popular education principles provides me with two significant insights: the conviction that our praxis can bring about transformative change in our realities and the belief that this power of transformation resides within each of us/them.

Academic cultures both from Europe and North America have also contributed to my individuation in this inquiry into young people and digital technology. Academia has provided me with a reassuring process to carry out research which could be articulated in several steps: find a topic of interest, read about this topic, define a question of research, collect data, analyze data, and compile a report. I followed this process for both of my master’s degrees. It gave me confidence and the guarantee of having a result at the end which was eventually confirmed by a degree. According to Elizabeth St. Pierre (2018), this is what qualitative inquiry can look like: a process to follow to tame the social, to give clarity to the interpretation.

Following the process systematically is supposed to guarantee validity, so it’s not a good idea to veer too far off the path—to include odd categories, to do things out of order, or to do things that have not been approved by, for example, an Institutional Review Board and, for doctoral students, the dissertation advisory committee (p. 603).

In North American research that centres on individual experiences, it’s essential to consider and discuss matters related to race and culture. The starting point for this examination should be the positionality of the researchers themselves. I am white and European from a historically colonialist and officially race-blind and culture-blind country which refuses to use the word “race” to differentiate people. Indeed, as Chong Breillon (2014) describes:

France's Republican tradition of universalism is often referred to as 'colour blindness', as race is absent from official discourse as a category of analysis (statistics on race are not taken in the census, for example) as Herrick Chapman and Laura Frader note (2004: 1). The ideology of sameness – that all French citizens are considered equal under the law – means that differences are subsumed into the whole according to a policy of assimilation that does not, on an official level, leave room for the public expression of ethnic, religious or racial difference. There are no 'blacks' and no 'whites' in France – everyone is supposed to be French. But since Frenchness is conflated with whiteness, not being white means not being viewed as full French citizens with equal access (p. 423).

Hence, France refuses the idea of a society divided into communities which is seen as opening the way to the threat of communitarianism. Being silent on race and communities reveals different ideologies, foundations, and perceptions of society and these are deeply impactful on policies, education and scholarship. While I grew up within what North American scholars could call a culturally and racially diverse society, French scholars rarely broach this subject, leading to a lack of consideration for race or culture as viable topics of study.

Moreover, as a French woman residing and pursuing studies in Canada, the enduring legacy of colonization manifests itself differently in these two nations. Having been raised in a country with a history of colonization, my perspective is inherently shaped by the experiences and narratives associated with a colonizing nation. Upon my arrival in Canada, I now find myself navigating and evolving within a context marked by a distinct history of ongoing colonization, a recognition that adds layers of complexity to my understanding of cultural dynamics and historical implications.

It is essential to emphasize that, within both configurations, I remain acutely aware of my privileged position. Whether navigating the historical remnants of colonization in my homeland or grappling with the complexities of ongoing colonial narratives in Canada, my recognition of privilege underscores the importance of critically examining and acknowledging the power dynamics inherent in these historical and cultural contexts. This awareness prompts ongoing reflection on how my positioning influences my perspectives, interactions, and responsibilities within the broader societal tapestry of these two nations.

All my education before the Ph.D. has been silent about issues of race, colonization, and whiteness. Rather than wondering if I can research individuals who are racially and culturally diverse, I follow Richard Milner (2007) when he asserts that:

I argue that researchers in the process of conducting research pose racially and culturally grounded questions about themselves. Engaging in these questions can bring to researchers' awareness and consciousness known (seen), unknown (unseen), and unanticipated (unforeseen) issues, perspectives, epistemologies, and positions (p. 395).

Since my study is interested in the relationships between individuals and technical objects, it is then essential to examine how we individuate in relation to race and culture and how it impacts our perception of the world. Indeed, as Fanon (2008) and Wynter (2001) contend, the stories we share and live by are different according to our culture or race. However, as I previously highlighted, these authors also demonstrate how the overarching narrative of "Man" prevails, functioning as a master narrative that normalizes the concept of whiteness. In this case, how do creators of technical objects envision the world, the racial diversity and cultural diversity? How are these reflected in the apps that people use (Bishop, 2018)? How do individuals experience these designs? How do they perceive digital worlds? And ultimately, how do I, as a researcher, perceive race and cultural impacts?

As a becoming-scholar, and someone committed to engaging with phenomena through a diffractive lens, I am particularly attentive to incorporating theories authored not only by men but also by racialized women whose experiences and perspectives differ from my own.

These elements of individuation have informed how I problematize the relationships between individuals and technical objects as well as how assumptions and analyzes emerge or are excluded. Recognizing my own individuation places me in the role of a participant in this research.

In the above, I reflected on how the relational ontology of this research can be articulated in the field. Here, I established a connection between my individuation and the subjectivity that shapes this study. Next, I consider the research context and then describe the interview, observation and walkthrough methods I employed.

3.3. Looking at the Elephant, No One is Innocent

With its relational ontological perspective and its diffractive reading acknowledging the diversity of situated knowledges, this research relies on “classical” ethnographic methods such as observation or interviews while acknowledging the materiality of these phenomena as well as participants’ individuations. Law and Urry (2004) assert that methods are performative, they make a difference in the phenomena we observe and can help bring into being what they also discover:

If methods help to make the realities they describe, then we are faced with the question: which realities might we try to enact? Neo-classical ones? Ameliorist agendas? Revolutionary realities? Anti-patriarchal or post-colonial worlds? Realities composed of post-structuralist partialities and shifting identities? Cyborg-like and materially heterogeneous worlds? These are just a few of the possibilities. (p. 8)

Indeed, we should not assume that methods discover a pre-existing reality. Using Law and Urry’s (2004) metaphor, the elephant feels different depending on where we touch it. But it is still an elephant (p. 9). Moreover, in a complex world, as there is no innocent knowledge, there are no innocent ‘methods’. All involve forms of social practice that in some way or another interfere with the patterns of physical, material or social. They are all part of that world.

When I embarked on my PhD journey, I envisioned a project that would align with both academic standards and scholarship criteria. It held the promise of providing answers to the fundamental questions that initially motivated this research. As I wrote scholarship applications and designed project narratives, I portrayed myself as being in control of the research time, space, and outcomes. Such processes provide reassurance to students, institutions, and funders. In the Western mindset, the traditional assumption is that research is conducted to discover something. As a result, I carefully defined the scope of the project, planned its different phases, determined their timelines and physical spaces, and even anticipated potential risks and devised strategies to mitigate them. This design process, as I described it to funders and ethics boards, leaves no room for unpredictability or indeterminacy. Everything is carefully controlled and accounted for.

Consistent with the principles outlined earlier, face-to-face interviews, observations and walkthrough were chosen as the methods for this research. Initially, I

planned to work with approximately twenty young people, two educators, and two parents. Recognizing that I am no longer a youth and wanting to immerse myself in youth activities, I decided to volunteer in two community settings that engage young individuals in various activities and provide digital literacy tutoring. Being a volunteer in these settings served a dual purpose: I wanted to actively participate in the activities and, in return, reciprocate the favour by offering my assistance. By becoming part of these community settings, I was able to interact with young people.

3.3.1. The Non-Innocent Participants

Participants in my research are numerous, diverse, and sometimes not initially envisioned. Using a relational ontology, a performative lens and a diffractive reading, the study draws in individuals as well as technical objects.

Through my volunteer work with two community service providers, I had the opportunity to observe and engage in interviews with various individuals ranging in age from 14- to 30-year-old. Community settings typically define young people based on specific age ranges when recruiting participants for their programs, often supported by federal government funding. Although the concept of individuation suggests that age should not be the sole criterion for defining individuals, I decided to adhere to the age range established by the community settings and recruit participants accordingly.

The Human Participants

To find people to participate in my study, I reached out to various community service providers that offer programs specifically designed for young people based on their age. I conducted this pre-selection by reviewing the eligibility requirements of their programs. While many programs cater to what is commonly referred to as 'at-risk youth,' I made a conscious decision not to contact them. The primary reason is that this research aims to minimize its reliance on categorization. For the others, although some community settings expressed interest in the research topic, most declined due to budget constraints or limited staffing. Additionally, low attendance among young people at these programs was cited as another deterrent.

Every time I engaged with a potential community setting, I emphasized that the study's objective was to enhance our understanding of the relationships between young

people and digital technologies. I acknowledged the expertise of the community setting and sought their guidance in customizing access to the field. While I had experience as an educator for adolescents in France, I recognized that the Canadian context might differ significantly.

Eventually, I commenced my fieldwork at the first community-service provider where I had been volunteering for one of their programs since 2015. Subsequently, a few months later, I began volunteering at the second community setting, facilitated by my supervisor's introduction to the program coordinator.

In the first community setting, DownTown, I had multiple meetings with the Director of the Adult Employment and Newcomers service, who was piloting the program. During these meetings, we discussed the scope of our partnership. Although the Director agreed with the research goal, several adjustments were necessary before proceeding with the ethnography. These adjustments included determining the minimum age of the participants and ensuring that both observations and interviews took place within the community setting, with the door of the room constantly kept open.

In the second community setting, NextTown, I agreed to let the program coordinator select the participants whom I would be able to interview. If interested, the potential participant could contact me, ask me any questions and then decide to participate.

DownTown

The community service provider in which this program occurred is located in an affluent community at the heart of a British Columbian urban area. This program was initially designed to welcome young newcomers to Canada from 13 to 23 years old.

Funded by Immigration, Refugee, and Citizenship Canada (IRCC), this program aimed to assist participants with their settlement process. Over a period of three months, young participants engaged in a weekly fitness activity and a cultural workshop to gain a better understanding of Canadian society.

During the initial three hours of each session, the youth coordinator allowed me to introduce the research and distribute consent forms to potential participants. This provided an opportunity for participants to ask questions and seek clarification. Many of

these questions revolved around the concept of youth and adulthood, such as who is considered young and who is considered an adult. Through discussions, we reached a consensus that participants who self-identified as young and were willing to be observed and/or interviewed could take part in the research.

In my role as a volunteer, I had the responsibility of guiding participants through the various activities and ensuring that everyone actively participated and enjoyed their time. The program initially began with a session in September 2019, which included twelve individuals. However, in January 2020, the organization decided to expand the age range and welcome young immigrants from 13 to 30.

Unfortunately, the second session was cut short in March due to the onset of the pandemic. The third session, which began in September, adopted a hybrid format, combining online and in-person activities. However, only nine young people registered for this session. Despite the challenges posed by the second wave of the pandemic, a fourth session commenced in January 2021, but this time with only three participants.

Due to low attendance, the organization made the decision to halt the program in February 2021. However, they later decided to restart it from September to December 2021, this time fully in person. In this final iteration, a total of 14 young individuals attended.

Throughout my involvement, I volunteered in all five sessions, interacting with more than 40 participants and one facilitator. I conducted interviews with twelve of the participants, as well as the facilitator.

During the program, digital technologies had a limited role as the main focus was on assisting young newcomers in their settlement process rather than specifically emphasizing technology. However, it provided a valuable opportunity to observe how individuals incorporated technology into various activities on an informal basis.

NextTown

This program provided and coordinated by a Neighbourhood House is located in a more underserved community which is rapidly gentrifying. In this program, several young people volunteered to provide on-demand training on digital literacy practices to help people using devices and services online.

My role as a volunteer in this second organization was to guide people in the use of digital devices. I started volunteering in NextTown in mid-October 2020 first in person and, when the second wave hit, continued the work online. When the restrictions lifted, a few months later, I came back to volunteering in person once a week and am still doing so.

In NextTown, the role of participants observed and interviewed is quite different from DownTown. Indeed, in this second setting, young individuals are present because their knowledge of technical objects is recognized and valued as useful for the community, which was not the case in DownTown. It is worth noting that to volunteer at NextTown the coordinator values the ability to speak languages other than English, as the learners who are attending speak diverse languages. In total, I interviewed five tutors as well as the coordinator of the program, whom I spent considerable time with her during the computer classes and also in planning meetings.

NextTown and DownTown are distinct community organizations that provide me with the opportunity to observe the dynamics of relationships between individuals and technology, regardless of their level of digital savviness, as they participate in the two programs. However, due to the COVID-19 pandemic and the need to ensure an adequate amount of data, I have employed an additional method of recruitment known as snowball sampling.

Snowball Sampling

In September 2020, the design of the research was slightly modified to be able to interview more people. Indeed, receiving the official ethics approval from the university at the end of January 2020, I planned to take time to build a stronger relationship with each individual before interviewing them. This plan was significantly disrupted by the pandemic as the B.C. government restrictions forbade public gatherings of any type. As a result, in March 2020, I observed a few sessions and interviewed two individuals from the first community service provider, DownTown. In September 2020, as the pandemic continued, the university's office of ethics permitted me to conduct interviews with individuals from my social network. I reached out to several friends and coworkers who were willing to participate and asked them to share my contact information with others who might be interested in taking part in an online interview. Therefore, I asked friends and co-workers around 25-years-olds if they were willing to talk about their daily life with

technical objects. The threshold of 25-year-old or around 25 is mostly the result of conversations with these potential participants about the research. Indeed, as it happened in DownTown, when they asked me at what age are we young, I often threw the question back at them to know whether they felt young or not anymore. These conversations were interesting as some criteria about age but also activities (studying, working) or social situations (single, having children) arose. As a result, four participants who felt they were answering their criteria of youth agreed to be interviewed.

In total, from January 2020 to December 2021, this research relied on the observation of around 40 young people engaged in activities related or unrelated to digital and on 23 interviews of participants (11 females and 12 males).

Table 1: Breakdown of interviews and observations

	Observation	Interviews (Facilitators)
First Community Service Provider	40	12 (1)
Second Community Service Provider	0	5 (1)
Snowball Sampling	0	4

Using a relational ontology and a performative lens, this research recruits and recognizes other participants such as technical objects.

The Technical Objects

In qualitative research, documenting human interactions is not only a common practice but also a requirement from the university ethics guidelines which ask to be cautious about the confidentiality and privacy of human participants. However, when it comes to including technical objects as participants, such as devices, interfaces, and algorithms, the task of listing these participants becomes more challenging and often overlooked. While researchers may acknowledge the importance of considering the role of technology in social interactions, capturing and documenting these interactions effectively can be complex.

Recognizing the need to include technical objects as participants is a key step. However, finding proper methods and frameworks to comprehensively capture and document these interactions presents its own set of challenges. Researchers need to navigate the nuances of technology's role in human interactions and adapt their

methodologies to ensure a comprehensive understanding of the phenomenon under study.

In this study, technical objects are identified and located through a combination of observation and interviews with human participants. Once identified, they are subjected to a detailed analysis that I will detail below, including an examination of their interface, design, and the website of their creators, as well as a review of recent scholarly research.

3.3.2. Capturing the Performativity of the Relational Ontology

The initial strategy involved in commencing the fieldwork with observation, allowed me to familiarize myself with the participants, before conducting interviews. By utilizing observation and interviews, I aimed to gain a comprehensive understanding of the technical objects they use, which in turn facilitated the application of the walkthrough method. Each of these methods is described in further detail below.

Observations

During the design of the study, prior to entering the field, my plan was to utilize observation methods to understand the everyday relationships between individuals and technical objects as they unfold in the present moment. By relying on a moment-by-moment description technique (Leander & Boldt, 2013) through the process of notetaking, I intended to capture the events and phenomena that were occurring, as well as those that caught my attention, in real time.

In total, I was able to observe 40 participants at DownTown from January 2020 to December 2021. All the participants whose age range varied from 14 years old to 30 years old, willingly agreed to take part in the observation during the weekly workshops. Since all the observations took place at DownTown, I had the opportunity to capture the relationships I intended to document from within an informal setting. It is worth noting that participants were not required to use digital devices for any specific reason or activity determined by the community setting. This allowed me to observe a diverse range of practices, including video gaming, social networking, online searches, as well as activities such as banking or registering for online classes, mainly on mobile devices but also on laptops.

From the end of January to March 2020, my attention was primarily focused on individual interactions with technical objects, and I paid less attention to collective aspects. This was largely due to my lack of knowledge about collective individuation during that time. This highlights the connection between a researcher's attention, their reading material, and their ability to observe unexpected or unanticipated phenomena.

From March to September, DownTown made the decision to temporarily close the program and the community setting in response to the BC health guidelines. During this period, I was unable to conduct observations and decided to read further about individuation and technical objects.

In September 2020, DownTown resumed the program, but this time it was conducted online through Zoom. Additionally, two or three workshop activities were scheduled to be in person, in the community setting. This transition to an online setting introduced new complexities to the study, as the digital was not only one of the objects of study but became the way through which observations and interviews could resume.

The utilization of Zoom brought about several changes in the group dynamics. Specifically, participants who would typically engage in conversations during activities were unable to do so in Zoom sessions as the organization often muted them to allow the facilitator to speak. Moreover, my initial plan of using observation as a method to establish a relationship with the young people became more challenging due to the transition to online sessions, which limited opportunities for casual conversations. Notably, the Zoom sessions attracted fewer participants compared to in-person sessions. Furthermore, the majority of participants chose to keep their microphones muted and occasionally turned off their cameras during the workshops. These circumstances made conducting observations more difficult. For those who had their cameras on, it allowed me to digitally enter their homes and thereby intrude on their privacy. However, I was not comfortable with this and decided against taking notes on such aspects, instead focusing on describing their behaviour or movements during the sessions.

Finally, in September 2021, the program started fully in person for its last edition. In this session, I paid particular attention to the collective dynamics of technical objects and the emotions and affectivities triggered by them. Notably, I observed instances such

as smiles prompted by posts on social media or heightened levels of anxiety caused by glitchy website interfaces. Also, as I became more familiar with the topics and what I wanted to observe I developed more awareness of the unexpected, which became consequently one of the main topics of my field notes.

During my fieldwork in person, my role as a volunteer sometimes hindered my ability to sit down with pen and paper during the workshops. Consequently, I relied on my memory to capture relevant observations shortly after each session which complicates the unfolding moment-by-moment of performative events. However, whenever I had the opportunity to directly document my observations while in community settings, some participants noticed and became aware of my note-taking activities. In such instances, I would pause and inquire whether they were comfortable with me writing about them. I also made it clear that they were welcome to review what I had written. Fortunately, all participants responded positively and accepted my presence as an observer and writer.

In general, it seemed that all participants were aware of the purpose of my presence. Some even playfully acknowledged it, such as Mark, who, during a workshop, looked at me and jokingly said, "Note this down, Gwen, it's good for your research!" Others took the opportunity to ask me questions about higher education and how I chose the program and university. While these interactions may imply an increased awareness of the research and potentially lead to changes in participants' behaviour, they also facilitated the development of relationships that I would not have otherwise been able to establish. It acknowledges the active role of the researcher as a participant in the research process, shaping the unfolding of the study through their interactions.

Interviews

The second method used in this research is the semi-structured interview. I planned to start my relations with individuals through volunteering and observation before asking them if they were willing to be interviewed. This is what happened at DownTown and some interviews were conducted thanks to the Snowball sampling but not at NextTown where the agreement was that the coordinator of the program pre-selects the potential participants. In addition, the initial vision of the research was to interview young individuals, educators and parents. I decided however, after a few interviews with participants to not interview parents. The reason is partly due to the

recruitment process as most of the participants arrived in Canada without their parents. Additionally, I was fearing that by interviewing parents, I might subsequently position individuals not as individuating beings but as the children of their parents.

Conducting interviews complemented the observation of participants by providing a deeper understanding of how participants perceive the role of digital technology in their lives. Through interviews, participants were able to articulate their relationship with technical objects by sharing personal memories and examples. This allowed for insights into processes such as individuation, the sociogenic principle, and concretization, although these insights may be partial in nature.

Initially, the interview questions were divided into four topics. The first one was getting to know each other with questions related to them, their arrival in Canada and what a typical day looks like for them. The second part invited the participant to share how they perceive their relationship with technologies in general. I also asked them what a typical day with technology looks like, how they learned to use specific applications, what activities they enjoy with technology and if they had any concerns about them. The third batch of questions focused on the changes they may have noticed since they started using digital devices. The fourth and final topic was about their future and their personal aspirations.

I used this guide for two interviews conducted in February 2020. After this, I had to add another section about COVID-19 and how they were living in this pandemic.

I followed this guide as a blueprint of questions but was comfortable if the conversation did go in other directions. For example, one of the participants spent a long time talking about how he felt about racism and discrimination. Others detailed how they acquired their financial literacy or how their parents influenced their choices of technologies. In these moments, rather than redirecting them to the interview questions, I asked follow-up questions and let them share their feelings about these topics.

Except for three interviews, the remaining 20 occurred online due to the pandemic and because the university forbade in-person interviews. These institutional constraints and recommendations affected the ways these encounters occurred. For example, online interviews disrupt the usual settings of in-person interviews taking place at the same moment in the same place. If we managed to share the same time, we did

not share the same geographical space, I was intruding on their private space and they were entering my personal space allowing a lot of things to happen: my cat unexpectedly invading the screen space, the noise from the different houses emerging, the digital cuts, the technical issues that arose. All these events are called “incidents” by Vasilopoulos and Bangou (2015), to refer to interactions with participants that are not supposed to interfere with the analysis of this research. But as Linnea Bodén (2015) asserts, when performing an intraview (as she calls the interview taking into account the materiality of the situation), what is important is not only the questions asked but also “the relations between the materialities, the participants, and the researcher that the interview opens up (...)” (p.195). But how do these entanglements affect the interview? How can I tell? Kuntz and Presnall (2012) answer as follows: “Rather than simply a tool of inquiry, we advocate for an understanding of the interview as a wholly engaged encounter, a means for making accessible the multiple intersections of material contexts that collude in productive formations of meaning” (p. 733).

The online conversation that I had with the participants, at a time of their choice and in a context that is familiar to them (it was for all of them in their bedroom), might have played a role in what they shared. This is true for participants I knew previously such as participants from DownTown or the snowball sampling but also for participants I did not know previously, such as those from NextTown. Indeed, it is probable that they shared more in the intimacy of their bedrooms than in the community settings or other public spaces. For several participants, it was their first time reflecting on how they use digital devices, when they began using them and how they are living with the COVID-19 pandemic.

It is worth noting that while the online video-conferencing application made the observation more complex, it seems to have played the opposite role in the interviews. In terms of the application used, both the community settings and the university preferred Zoom for the observation. However, for the online interviews, Jitsi, an open-source application for video-conferencing, was chosen instead of Zoom. The decision to use Jitsi over Zoom was based on my attention to the confidentiality and privacy of the exchanges occurring through the platforms. Jitsi provides clear information on how data are treated and ensures anonymization of the participants' information.

Also, moving from audio-recorded interviews to online interviews enabled me to video record the interview. While the consent form had been amended to allow the participant to authorize the use of video-recording, only one of the participants refused.

In total, 23 participants, 21 young participants and two educators, agreed to be interviewed. While most interviews lasted around an hour, two of them were notably longer, exceeding two hours in duration. Each interview, once it was done, was transcribed and submitted to the participant, asking them to review it to check for accuracy and also for details that in the re-reading, they may choose not to share, or wish to rewrite. Contacting them a few months after the interview also allowed me to check on them and ask them how they had been doing in the subsequent time period since the interview. After the interviews were reviewed by participants, I carefully checked these encounters again by attentively listening, observing, and recalling the interactions. My focus was not only on what was explicitly communicated but also on what emerged beyond the spoken words, such as expressions of emotions, affectivities, how the participants move in the space, and sounds of incoming notifications. During this process, I annotated the initial transcript to capture and highlight the underlying relationships that surfaced within the interviews. The table below details the list of participants in this research.

Table 2: Individuals, participants in this research

Participant	Gender Identity	Age	Community Setting
Ani	Female	30	DownTown
Mark	Male	30	DownTown
Gisele	Female	27	NextTown
Beah	Female	30	DownTown
Miles	Female	16	DownTown
Green	Male	14	DownTown
Amy	Female	21	DownTown
Kitty	Female	29	DownTown
Kevin	Male	19	NextTown
Sky	Female	25	NextTown
Rosa	Female	18	NextTown
Bruce	Male	16	DownTown
Abel	Male	24	SnowBall
Shiva	Female	18	SnowBall

Fae	Female	18	NextTown
Sari	Female	17	NextTown
YB	Male	24	SnowBall
Gary	Male	26	NextTown
Yuki	Male	20	DownTown
Dave	Male	18	DownTown
Sahil	Male	19	DownTown
Silas (Educator)	Male	29	DownTown
Rya (Educator)	Female	47	NextTown

A power relationship needs to be clearly stated here. While I am taking several weeks to write, rewrite, correct my writing, and tailor the wording to make it fit my understanding, participants do not have this opportunity and consequently, it would be easy to make them appear less literate than I am. To mitigate this, I have decided to remove the repetitions of words when I transcribe what they say, their verbal hesitation, and their verbal tics, such as the repeated use of “like”, and “you know” when I submit these excerpts used in this dissertation.

While the interviews provide valuable longitudinal perspectives on the participants' relationships with technical objects and their usage, it is important to complement them with other methods to gain further insights and understanding. To address this, I have incorporated the walkthrough method, as defined by Light et al. (2018), which allows for a comprehensive exploration of technical objects and their interactions with human participants.

Walkthrough

The walkthrough method employed in this study, initially developed by Light et al. (2018), is described by its authors as "a way of engaging directly with an app's interface to examine its technological mechanisms and embedded cultural references to understand how it guides users and shapes their experiences" (p. 882). This method involves a systematic process of observing and documenting the various aspects of the app's interface, features, and activities. Additionally, it entails conducting a thorough review of the app's vision, operating model, and governance by visiting the app's website and consulting relevant scientific literature related to that particular app. By following this approach, a comprehensive understanding of the app's functionalities and its broader context can be gained, shedding light on how it influences users and their experiences.

After noticing the use of a technical object during the observation or interviews, I often proceeded to download the application on my personal device. Subsequently, I meticulously documented the various steps involved in creating an account and logging in, attending to visual elements displayed on the screen, such as colours, icons, text, pictures, and videos. The objective was to gain insights into the app's functionality, the meaningfulness or lack thereof in the design of its icons, and the type of information it requested from users. This included inquiries about age, gender identities, personal preferences, and typical activities, among other details. Through this process, I aimed to comprehend how the app operates and how its interface and data collection practices contribute to the user experience.

Following the initial encounter, I proceeded to enter the name of the application into a search engine. The purpose of this action was to access the website of the app's creators and explore any relevant information related to their current and past events. Conducting this research on the internet yielded valuable insights regarding the promotional strategies employed by the creators, the intended purpose of the application, and its evolutionary trajectory, i.e., how it has materialized and transformed over time. Additionally, by examining the public events associated with the application, I gained a further understanding of its concretization and the broader context in which it operates. This exploration contributed to a deeper understanding of the application and its creators.

The final step in the process involved conducting a literature review on the technical object whenever possible. It is worth noting that some of the applications mentioned by the participants, such as TikTok, are relatively recent, which resulted in limited existing research on these specific technical objects. Nevertheless, efforts were made to explore available scholarly literature and related studies to gather insights and contextual information on these applications. While the literature review may have presented challenges due to the novelty of certain technical objects, it still provided valuable perspectives and supplemented the understanding of these emerging technologies.

The walkthrough method employed in this research enables the technical object itself to be considered as an active participant. By utilizing this method, it becomes possible to observe and analyze the sociogenic principle underlying the application, as

well as how it influences its visual design and operational processes. This approach complements the observational part, which focuses on the performative aspects of the ongoing relationships between individuals and technical objects. Additionally, the interviews with individuals provide insights into their personal experiences, highlighting aspects of individuation and sociogenic principles. These three methods, namely observation, interviews, and the walkthrough approach, were employed to collect data for this ethnographic study, facilitating a comprehensive examination of the research topic.

3.3.3. Data

The purpose of these methods is to collect data that would inform the thresholds and their analysis of this research. In this section, I discuss how I have collected data in this study.

In qualitative research, the complexity of realities is usually captured through data. As Elizabeth St. Pierre and Alecia Jackson (2014) emphasize, the quality of data as worthy enough to be analyzed is often taken for granted. They continue: “In conventional humanist qualitative research, words in interview transcripts and in field notes are considered primary data, collected as they are in “face-to-face” encounters in the presence of participants in their natural settings” (p.716).

They identify two interlocking problems with the process described in this quote. The first one is related to the primacy of the presence. We often note only what is present. During the process of interviewing and observing, it is crucial to not only focus on what is present and actively participating but also to recognize the significance of what is missing or absent. Relying on a deconstructionist perspective (Derrida, 1967), which views terms traditionally perceived as binary as two poles on a continuum, it is crucial to acknowledge that the absence is as significant as the presence. The absence itself leaves traces that merit careful consideration. By paying attention to these traces, researchers can attain a deeper understanding of the research topic. This issue seems to be significant in both interviews and observations. During interviews, participants may not only share their personal perspective on what occurred but also choose to omit certain aspects of their narrative. Moreover, it did not occur in this research that participants reached out again to provide additional insights that might have escaped

their initial interview. In the case of observations, it is impossible to record every detail, leading to a selection process where certain elements take precedence over others. Additionally, during the walkthrough of several apps, I oriented the literature review toward what I thought was interesting. However, during the analysis and review of these notes, efforts can be made to address this privilege of presence and consider the significance of what is absent or missing to mitigate any potential omissions.

The second problem that St. Pierre and Jackson (2014) identify in the traditional conception of data in qualitative research is the assumption of the words used taken as “brute data” available for the interpretation of the data collector. However, as Maggie MacLure (2013a) points out, adopting a non-representational lens necessitates recognizing that data have their own ways of making themselves intelligible to us. As underlined previously about the observation, it seems impossible to collect all the information available in a particular event. The process of notetaking in observation is made of choices, conscious or not, about what to note. Which data are glowing (MacLure, 2013b)? Which ones become problematic (Koro-Ljungberg et al., 2018) as they might not align or even contradict the others? In this case, what do we do with these inconvenient data?

Conscious of these two challenges, this research acknowledges both the uniqueness of the pandemic and the understanding that some data shine more brightly than others when connected with theories. It manifests itself within a metastable milieu and, as a result, cannot be easily replicated. These changes in the concretization process of the study's organization have influenced the collected data, which no longer solely belong to specific spaces or moments. When placed in relation to one another, they take on a new form. The focus of this research lies in what emerges from the interplay of data, theories, and their becomings.

As Jackson and Mazzei (2018) argue, the methods used and the data collected in this research have been influenced and transformed by the theories being explored at the time. They view thinking as a transformative process, recognizing that movement, breaks, connections, and contamination are necessary for anything to evolve, whether data, theory, the subject, or knowledge itself. Engaging with theories raises questions about blurring the division between data and theory and challenges the notion of authorship.

In its current form, this thesis follows a conventional structure, comprising sections on theory, methodology, and thresholds. However, it is essential to recognize that this text presents an appearance of organized thought and a controlled research trajectory, which the writer is assumed to be responsible for. The emergence of potential findings in this study is a result of a complex interplay between the collected data, reviewed theories, and the multitude of actors involved, including research institutions, the researcher(s), and both human and more-than-human entities.

Vignettes

Recognizing the significance of each participant's story, whether human or more-than-human, has prompted me to employ narratives as a means to describe and analyze the research results. These narratives, presented in the form of vignettes, are influenced by what Rosie Flewitt (2011) refers to as "theorized interpretations of the activity that was occurring" (p. 302). Consequently, they offer a condensed illustration of observed practices, where certain aspects are emphasized while others recede into the background.

Yet, the use of the vignettes also permits a contextualization of the scene and to capture the interplay of different participants such as individuals, technical objects, flows of power, emotions or other elements within the agencement described in each vignette. These vignettes do not attempt to provide an exhaustive explanation of all events within the spatio-temporal scenes. Instead, they serve as a foundation for analyzing two specific aspects. These vignettes are based on which data glow (MacLure, 2013b) as well as theories that resonate and trigger my curiosity. It is important to note that the selection of data for these vignettes is not arbitrary; rather, it emerges from a deliberate engagement with the central questions of this research and the theoretical and methodological framework outlined earlier. If this conscious process of data selection is ubiquitous in qualitative research, the theorization of the vignette as a partial recollection and narration of what happens makes it obvious and acknowledged. But using vignettes does not mean giving up on ethical rigour to lead this research. Instead, as Rosie Flewitt (2011) explains:

[it] provides a powerful set of tools for understanding the diverse layers of social orders and meanings that are sensitive to local forms of action and representation, and that reveal how the ways in which adults position and promote literacy artefacts – from policy level down to the micro-level of

moment-by-moment interaction – has deep effects on children’s multimodal engagement with literacy in different modes and media. (p. 307)

To underline the boundaries of each vignette, I include a graphic illustration at the beginning and at the end of each. These illustrations, while partial and unable to capture the full complexities, indeterminacies, and intensities of each phenomenon, remain valuable in aiding the reader's understanding of the emergence of the phenomena described in each vignette.

3.3.4. The Ethical Adjustments

As detailed in this chapter, the progress of this research has necessitated ongoing adjustments to the methods employed. In addition to adhering to the ethical guidelines set forth by the university, this research has strived to establish a safe and inclusive environment for all participants. However, it is important to recognize that the ethical process itself has required contextual adaptations, as noted by Katie Warfield (2019):

The method and methodologist become, or as Karen Barad (2007) would describe, intra-act, together. Methods are never fixed and neither are methodologists — both are always in process as “with each intra-action, the manifold of entangled relations is reconfigured” (Barad, 2007, p. 393-394). (p.149)

Katie Warfield also wonders about who or what benefits from the different methods used in research? The researcher? The participants?

On a more formal level, the methods used in this study had to evolve due to the COVID-19 pandemic moving from in-person meetings to online ones. Likewise, so did the ethics. Indeed, observing and interviewing people in a public community setting is different from observing and interviewing them in their house, a private space, or through an online service which has its own ethics. As Katie Warfield (2019) underlines “To assume that anything is made in research by the magical solitude of the researcher is at once humanistic, selfish, and frankly delusional” (p. 148).

Accordingly, the ethics protocol has been amended several times during these two years of fieldwork. However, if receiving the official approval is a requirement, it does not exempt the researcher from attention to how ethical relations unfold. For

example, after collecting these 23 interviews, some of them were more than one hour long, I wanted to use an online service to transcribe these interviews from audio to text. At first, the decision to upload interview data to a foreign server seemed like a practical time-saving solution. However, upon being alerted to the privacy implications of this practice by my supervisor, we began to investigate how other professionals in academia were handling this automated phenomenon. Our research revealed that the university's Office of Research Ethics was already aware of this privacy breach and had instituted a protocol requiring investigators to seek approval before uploading interview recordings to foreign servers. Consequently, we took steps to amend our current research protocol and ensure that all interview data was handled in a way that respected the privacy of the participants. This is what was done for the three interviews that were on the foreign server. After explanation and discussion, all the participants agreed to have their interviews on the server. Nonetheless, a decision was made to stop the process as I did not feel comfortable to potentially put in danger the confidentiality of the conversation I had with some of the participants.

This example shows how questions of ethics, consent, privacy, and confidentiality are always fragile and an ongoing process in research and need constant attention. Indeed, a thorough examination of the ethics of the technical objects used in a study is crucial because, as theorized above, technical objects are never neutral and bear values. It then becomes important to question if the values of these objects align with the values of the research and participants.

In this study, special attention has been given to the technical objects used to concretize this writing. Wherever possible, considering my technological expertise, open-source platforms and applications have been used. For example, while the final result of this writing is delivered in a proprietary format, docx, the Microsoft Word format, I have chosen to write it in Markdown language on an open-source editor. The references of this study have been collated on Zotero and the interviews I made were recorded through an open-source video-conferencing platform.

All these interrogations contribute to the ethics of this research beyond the university requirements. Indeed, if this step is necessary, as a researcher performing in phenomena, this study needs to be response-able (Barad, 2006) and account-able to the different participants. Ethics is about mattering, about taking into consideration the

entangled materializations of which we are part, including new configurations new subjectivities, and new possibilities (Barad, 2006). We are responsible for the world which we are a part of, not because it is an arbitrary construction of our choosing but because reality is sedimented out of particular practices that we have a role in shaping and through which we are shaped.

3.4. Thinking with Theories

While Gilbert Simondon and Sylvia Wynter's concepts of individuation, sociogenic principle and technical objects enable this thesis to analyze the processes in action and to consider these actors as entangled in relational processes with a past and a future in becoming, performativity allows us to examine what individuals and technical objects do at a particular moment. This diffractive reading on both individuals and technical objects in different agencements triggers some additional questions such as:

- What are the relations between individuals and technical objects?
- Who are the doers, what are the deeds?
- How do agency and becoming materialize in these relationships?

Ultimately, plugging in the theories, methodology and different thresholds might help define the unicity of what we usually define as digital technologies and their performativity in digital literacy frameworks.

3.5. Conclusion

The theoretical framework and the methodology of this research are intricately connected, and in this chapter, I considered how theories emerge in the act of inquiry. Building upon the ontology discussed in the previous chapter, this study positions itself as performative and acknowledges the potential benefits of employing a diffractive reading. Such an approach enables the identification of what constitutes data and their relative meanings, which in turn influences the research questions addressed. By embracing a performative and diffractive stance, this research not only avoids generalizations but also establishes a strong ethical foundation that extends beyond institutional requirements. Acknowledging the present and the becoming requires

readjusting, moment-by-moment the ethical aspects of this research. Ethics is not an a-priori intention but needs to be assessed throughout this research.

Once the ethico-onto-epistemological stances advocated by Karen Barad (2006, p. 381) are acknowledged, it brings about concrete changes in the field of research. The adoption of an ethico-onto-epistemological stance implies recognizing the inseparable entanglement of ethics, ontology, and epistemology. It entails an understanding that knowledge production is not separate from the ethical and ontological dimensions of the research context, but rather intricately intertwined with them.

This acknowledgment prompts a shift in how research is conducted and interpreted. While traditional research methods such as observations, interviews, and vignettes may still be employed, their implementation is influenced by the ethico-onto-epistemological stance. This means being attuned to the ethical implications and consequences of the research process, recognizing the ontological entanglement between the researcher, participants, and the research subject matter, and embracing an epistemology that acknowledges the co-constitutive nature of knowledge production.

Moreover, the novelty of this research lies in its diffractive reading of evolving relationships and their becomings. A diffractive approach goes beyond linear analysis or linear causality and instead focuses on understanding the complex entanglements, interferences, and interrelations among various elements. It allows for a nuanced exploration of how different aspects interact and co-emerge, fostering a deeper understanding of the subject matter.

In conclusion, adopting an ethico-onto-epistemological stance and employing a diffractive approach enriches the research process by foregrounding the ethical, ontological, and epistemological dimensions of the study. It offers a more comprehensive and nuanced understanding of the research subject, enabling researchers to engage with the complexities and entanglements that shape the phenomena under investigation.

Chapter 4. First Glimpses in the Performativity of Individuations and Concretizations

4.1. Introduction

The purpose of this short chapter is to bridge the theoretical and methodology sections with the findings of this thesis. It accomplishes two key objectives. Firstly, it clarifies how the conventional understanding of 'findings' is presented in the following two chapters, and explains how I communicate and explore the progression from the methodology to findings. Secondly, this chapter introduces aspects of the *agencements* through portraits of selected research participants as both individuals and technical objects. These portraits enable readers to become familiar with the unique stories of each participant and the phenomena that influence their experiences.

4.2. Findings as a Threshold

Expanding on thinking with theories, which constitutes the blueprint of this research, Jackson and Mazzei (2013) provide the image of the threshold as where data and theories meet:

We offer the figuration of the threshold as a way to situate our “plugging in,” or how we put the data and theory to work in the threshold to create new analytical questions. In the space of the threshold, we became aware of how theory and data constitute or make one another—and how, in the threshold, the divisions among and definitions of theory and data collapse. (Jackson & Mazzei, 2013, p. 264)

The threshold recognizes the productivity of the relations between theories and data which make and remake each other triggering new questions and new analyses.

Chapter 5 focuses on the processes of individuation and concretization, as well as the emergence of an individual's relationship with a technical object. It examines how individuals form a connection with these objects and the various factors influencing this process.

In Chapter 6, the collective and political dimensions of these processes, along with the technicity of technical objects, are investigated. This chapter delves into the

broader social implications and power dynamics associated with the interactions between individuals and technical objects.

As mentioned earlier, I accomplish these goals through vignettes that present data through narratives. For each vignette, I focus on two important aspects. These are not intended to be exhaustive, but to speak to meaningful elements within the intricate and unpredictable relationships between individuals and technical objects.

In what follows, I describe individuals and technical objects that play active roles in the vignettes. These are transitory and are intended to orient the reader to the participants in each vignette, both human and technical objects. More details of relations, becomings and what emerges from these are found in Chapter 5 and Chapter 6.

4.3. Portraits of Participants

Of the 23 interviews and observations involving more than 40 individuals, the portraits of six individuals and eight technical objects participating to the five vignettes detailed in the next chapters are presented here, in alphabetical order.

Abel

Abel is one of the participants I reached out to from my personal network. Throughout the interview, he often engages in self-deprecating humour and provides a didactic approach when discussing digital technology and its integration into his everyday life.

Born in Canada, his parents immigrated a few years before from China. At the moment of the interview, in December 2020, he is 24 years old and has just finished nursing school as a Licensed Practical Nurse. Currently, he works as a vendor in a big retail store while waiting for an answer from the union for several applications in the British Columbian health care system. He hopes one day to be a Registered Nurse. He would love to work in rehabilitation because he wants to see the physical recovery of his patients.

He is currently living with his parents and his older brother in a house they have owned for 20 years in the east part of the main city.

Abel typically wakes up around 10 am and begins his day with some stretches, an activity he has enjoyed since the start of the pandemic. Afterward, he checks his social media before heading to work. Following work, he takes pleasure in engaging in exercise and:

I would be on YouTube watching videos about how to create a side asset or how to create a side income or a passive income or stuff like that, so that is how I use my social media to find different ways to make money (Abel).

Otherwise, his hobbies during the pandemic are reading books to help him self-improve.

Abel has set clear goals for his future, which include taking care of his family, supporting good health, achieving financial stability, cultivating a strong relationship with his girlfriend, and establishing multiple streams of passive income. Additionally, he wishes to remain in British Columbia.

Dave

Dave is a participant in the last session of the program welcoming newcomers in DownTown. Quiet during workshops, he often comes with a book that he discusses with Sahil, another participant. After presenting my research during the first workshop, he came to me saying that he would be happy to attend and asked me various questions about my academic journey, and the reason I chose the university I am registered in. He told me he may consider a Ph.D., probably in Ontario, in the future. When I inquired about the reason behind this potential decision, he explained that he doesn't have a strong attachment to British Columbia. Despite having friends there, he feels a lack of deep roots that would compel him to stay in the region.

Dave's interview took place immediately following a community workshop on safety held in DownTown. Discrimination against visible minorities, especially during the pandemic was one of the topics of this workshop. This topic had an impact on this interview and triggered a conversation on this subject.

He left China for Canada when he was 12, with his younger brother and his mother to join his father, who was already here. He started school in Canada in Grade 7. According to him, the transition from China to Canada was smooth. He stayed in the

English Learner Language class until Grade 8 and then continued in “regular” classes. After graduating from high school, he did not feel ready to tackle university right away and consequently preferred to take a gap year to be entirely ready.

In his gap year, he is studying math and sciences on his own, and trying to do things he is interested in, such as sports, playing piano, and taking online courses while applying for scholarships as he is planning to go back to school next year. Playing piano since Grade 2, and being at an advanced level, obliges him to train daily, comparing himself to an athlete. He has also managed to work as a part-time barista in a big company of coffee shops. At the end of the program, he convinced Sahil to apply to the same coffee shop as him.

Dave envisions a future where he avoids being tied down to a single location for an extended period. He has a strong desire to acquire proficiency in multiple languages to cultivate an international perspective. Recognizing the demands of the global market, he understands the importance of adapting to evolving skill requirements within societies. Consequently, he is open to the idea of not pursuing a lifelong career in his field of study or finding a job that perfectly aligns with his educational background. Inspired by his parents' experiences, he seeks a partner who is independent and does not depend solely on him for support.

Gary

I met Gary through the coordinator of NextTown. After a brief email exchange, we both managed to meet online. When conversing with me, a Caucasian, educated, middle-aged, white-collar woman, Gary's intention to educate me about digital technology, rather than solely sharing his experiences as a male student with immigrant parents from India, becomes apparent. This is evident in his efforts to rationalize and analyze his digital usage, as he takes the time to provide detailed answers and elaborates on various aspects.

This behaviour might indicate his awareness of the power dynamics inherent in the conversation. Firstly, the positioning within the interview highlights the power dynamics. As the interviewer, I was guiding the conversation by asking questions, while Gary was in the position of responding to them. This hierarchical structure implies a power imbalance. Additionally, the racial and age differences between Gary and I play a

role. Given his keen observance and awareness of discrimination stemming from his life experiences, being interviewed by an older white woman could potentially trigger his sensitivity to power dynamics associated with race and age.

Conscious of these power dynamics, I heard patronizing sentences and numerous allusions to my privileges. In response, my strategy was to acknowledge these power relationships by agreeing with him when discussing discrimination and redirecting the conversation to this topic, positioning him as a knowledgeable and literate individual on the subject matter.

Gary explained that not only he but also his family members are victims of discrimination, whether as a Sikh child, a student of colour or as a taxi driver. The discrimination he talks about is mainly related to his race and the social class his family belongs to. If several other interviews mention discrimination, Gary is the only one who talked openly about the ones he has been the victim of.

Gary was 26 years old at the time of the interview in June 2021, born in Canada to parents who immigrated from India. He described his family:

I'm born to immigrant parents, and they are not educated formally. So, they have a grade 10 high school education from India. They barely know English. Whatever English they do know is acquired through interactions in their 25-30 years here. (Gary)

His parents chose British Columbia because his paternal grandfather was already there. Gary thought it was a good choice despite "colonization and racism". All through the interview, Gary stated he was very attached to both Punjabi and Canadian cultures. This is clear through the language (he fluently speaks Punjabi and English) but also through a deep interest in the History and news of the two areas.

After dropping out of a university in the lower mainland, he decided to pursue a bachelor's degree in criminology at another institution to eventually gain admission to Law School. When I interviewed Gary, he mentioned that he had taken a year off to prepare for the LSAT, which is the entrance exam for Law School. Alongside his LSAT preparation, he also dedicated his time to volunteering at NextTown. In September 2022, Gary informed me that he would be starting Law School that year.

Gary is proud of what he has accomplished so far in his studies. He further jokes that he wants to be like Robin Hood before more seriously explaining that he wants to be a normal person living a normal life, succeeding “thanks to his skills and abilities despite his cultural background and the colour of his skin (sic)”.

Google Maps

Participants often mention Google Maps, a web mapping platform launched by Google in 2005, when discussing the apps on their mobile phones.

Google Maps has a rich history rooted in various acquisitions. The app's origins can be traced back to the contributions of Lars and Jen Ellstrup Rasmussen, Danish brothers who played a significant role in its design. Additionally, Google acquired Keyhole, a company specializing in geospatial data visualization, which further influenced the development of the platform. Another noteworthy acquisition was ZipDash, a company renowned for its real-time traffic analysis services. These strategic acquisitions played a crucial role in shaping Google Maps into the comprehensive mapping platform that it is today.

In 2005, Google Maps demonstrated its significance in the aftermath of Hurricane Katrina by promptly updating its satellite imagery of New Orleans. This allowed users to assess the severity of flooding in different parts of the city. Since then, Google Maps has undergone continuous evolution, enhancing its capabilities and incorporating additional features. Today, it offers a wide range of functionalities, including route and transit planning, real-time traffic updates, street views, and recommendations for local attractions. Its user-friendly interface and comprehensive features have made it an indispensable tool for navigating and exploring the modern world.

Instagram

Instagram, a widely used application among participants, provides a platform for users to share photos and videos while also enabling them to view content posted by accounts they follow. The app was initially launched in 2010 in San Francisco, California, exclusively for iOS devices by Kevin Systrom and Mike Krieger. What sets Instagram apart is its unique feature that allows photographers to apply filters to enhance their images, adding a visually appealing touch. In 2012, Instagram was acquired by Meta, previously known as Facebook, which further contributed to its growth and development.

Since its inception, Instagram has continually evolved and introduced new features, often in response to competition from other social media platforms. For instance, in 2020, Instagram introduced "Reels" as a response to the rising popularity of TikTok. Reels enable users to create and share short-form videos set to music, similar to the functionality offered by TikTok. Despite the competition, Instagram remains a favoured platform for sharing photos and connecting with others in North America.

Jitsi

As an enthusiastic open-source application user, I conducted online interviews through Jitsi (Lesage & Lusoli, 2021). The platform allows both an audio or video meeting setup and the ability to record it. Jitsi was favoured over Zoom for both practical and ethical reasons including the flexibility of access without downloading any software or registering an account. Moreover, the platform provides valuable security features such as encrypted communication and the insurance that Jitsi does not store any data from the videoconference option.

Created under the name of SIP Communicator, a video-phone application, by Emil Ivov, a student at the university of Strasbourg (France) in 2003, the application was renamed Jitsi in 2011. One year later, Jitsi became a video-conferencing application with the ability to call and be called through the browser. Even if still relying mainly on its open-source community and structure, Jitsi was acquired by Atlassian in 2015 and in 2018 by 8x8.

Before starting each recording, I explained the motivations for using Jitsi instead of other more familiar video-conferencing platforms and this solution seemed to suit everyone whether ethically or technically. This explanation sometimes began a conversation about privacy and the datafication processes.

Kevin

I met Kevin while he was working at NextTown in October 2020. The interview occurred at the end of one of his workdays. Partly due to it being an online interview and due to a bad connection, Kevin was really focused on the screen. As a young individual but also as an educator, his position during the interview was not clear and he was carefully answering my questions even if I made clear that I would not share the content of this conversation with anyone else without anonymizing his name.

Kevin is 19, born in Canada from Chinese parents. He is enrolled in the third year of a Bachelor of Computer Science at a local university. He has chosen this field of study because:

my parents told me so, I didn't really know what to choose, I wanted to do biology or something, but computer science I did not really enjoy the first year. [...] but I got more into school, so now I am pretty interested in computer science. (Kevin)

During the weekend he also teaches First Aid. With all his activities combined, he says he has no time anymore to participate in other activities.

In the future, Kevin would like to work in the healthcare system after completing either a master's degree or a Ph.D.

Miles

In October 2020, during the third iteration of the twelve-week program in DownTown, I had the opportunity to interview Miles. Miles took part in the program alongside her younger brother, Green. While generally quiet, she showcased her abilities and excelled in several activities organized by the program.

During the interview, Miles displayed awareness of my role as a student and expressed curiosity about my motivation for pursuing education and the benefits I expected from the experience. Toward the end of our conversation, she inquired about my journey and the factors that influenced my choice of one university over another.

After the interview, I shared relevant links about degrees and subjects that she might find interesting. I also suggested that she explores connections with various universities to gather more information and explore her options.

Miles is a 16-year-old girl from the Philippines. She arrived with her father and Green in February 2020. Her mother arrived two or three years ago.

She started school a few days after her arrival and was immediately welcomed by other Filipino teenagers. During the pandemic, she went to school only in the morning as the rest of the day was online. Otherwise, in her free time, she liked doing Taekwondo and playing piano. At the time of the interview, she was looking for a job in

retail or fast-food, or in a restaurant to help her parents, but this search was complicated by the pandemic.

She envisioned working in the technological field and try to help friends from the Philippines to immigrate. She would love to spend some time discovering Belgium as it appeared to her that it is a beautiful and quiet country.

Mobile Phone

All individuals encountered in this research possess personal mobile phones. Except for Gary, who received his first mobile phone in high school, the others remember acquiring their first one before turning 12 years old.

The concretization of the mobile phone underlined below shows how the milieu of the technical object plays a pivotal role in transitioning from the wired phone accessible only in specific buildings to the ubiquitous pocket-sized terminal.

Following Alexander Graham Bell's invention of the telephone in 1876, the wired network rapidly expanded. Despite early attempts, the notion of making and receiving calls beyond households, starting with automobiles, gained popularity in the United States and Eastern Europe after World War II. However, it wasn't until the 1980s that the commercial launch of mobile phones occurred. Initially operating on analog cellular systems, the desire to expand mobile phone coverage drove the transition to digital cellular systems. As people increasingly incorporated mobile phones into their daily lives, it became evident that there was a growing demand for data, particularly for internet browsing.

The introduction of third-generation (3G) technology in the mid-2000s marked a transformative moment in the industry, enabling, for the first time, media streaming of radio and even television. It was during this period that most of the research participants began using this technical object.

Throughout observations and interviews, mobile phones consistently played an active role at the moment, either visually (in individuals' pockets or hands) or audibly (through vibrations and ringtones).

Personal Computer

All the participants interviewed in this research explained having a personal computer, with most of them citing a laptop.

Similar to mobile phones, the development of the personal computer reflects progressive individualization and personalization of use. In the history of computing, early experimental computers could be operated by a single attendant. If this type of technical object was frequent within military or research settings, it was only by the end of the 1970s that Apple introduced computers that were assembled and tested, marking the onset of the era of mass-market. Apple's personal computers allowed a wider range of people to use computers, focusing more on software applications and less on the development of processor hardware.

From 1972, the potential utility of portable computers was apparent, but it wasn't until the 1980s that new techniques, such as dynamic power management designed to maximize battery life by using minimum power, were developed for laptops. Starting in the 2000s, mobile computing became increasingly popular, enabling users to access computing power on the go.

If participants rarely brought their laptops during the observed activities, the use of them is apparent in the final vignette in which Luke uses her laptop to check her registration for post-secondary school courses.

RateMyProfessors.com

This website was mentioned during an informal conversation in DownTown and is part of one of the vignettes. Several participants were talking about how they chose their course in higher education, and it appears that all of them mentioned this website to assess the relevance of a course. This review website was funded in 1999 by a software engineer in California to allow anyone to rate professors and higher education institutions, university, or college. It now belongs to an American live-streaming financial news network, Cheddar Inc.

On this website, any user, after creating an account, can rate professors or schools of their choice. On a scale from one to five, they supply grades to the professor, from Awful to Awesome, assess the difficulty of the course, and give their opinion about

whether they would take this course again or not. Regarding the course, they can answer whether or not the course is easy, if the professor uses a textbook, and if attendance is mandatory. Following these questions, they can select three tags describing both the professor and the course as well as writing a review. This review is anonymous to the public and the professor cannot require the removal of any comments provided they are aligned with the site guidelines. As is promoted on the website, a team of moderators ensures that the site guidelines are respected.

TikTok

TikTok, the second most popular social media platform frequently mentioned by participants, has experienced rapid growth since its launch in 2017 by Bytedance, a Chinese company. It serves as the international version of Douyin, a video-sharing app focused on Mainland China. While both apps have a similar user interface, Bytedance asserts that they do not have access to each other's content. In 2018, Bytedance merged Douyin and TikTok with Musical.ly, a lip-syncing music video app.

TikTok allows users to create short videos, typically around 15 seconds in duration, incorporating a wide range of visual effects and audio options. However, the app has faced significant controversies related to user privacy, resulting in its ban in several countries. Despite these controversies, TikTok remains a popular platform for users to share creative content and engage with others.

Yuki

Yuki was a participant in the last session of the program for young newcomers in DownTown. Very friendly and talkative, he was happy and motivated to participate in this research. Before the interview in November 2021, we first connected as he was playing a game, Royal Clash, on his phone. During the interview he seemed quite open, answering questions with lots of details.

Yuki, a 20-year-old, arrived from the Philippines in 2015 with his mother, father and two brothers. Currently, he is enrolled in a program in psychology at a local university. All the family members except his youngest brother work to pay the bills as Yuki says. Yuki was working as a part-time youth educator.

Otherwise, Yuki is an avid gamer both on the phone and on his desktop. He learned Japanese and how to play piano from watching YouTube.

After graduating, he would love to spend some time travelling maybe in Japan, and then come back and live near his family and find a job in the healthcare system in British Columbia.

Zoom

Even if this research does not use Zoom to record online interviews for ethical reasons outlined earlier, it appears that Zoom has been used as a video-conferencing platform by the programs from the two community-provider settings.

Zoom Meetings was created in 2012 by Eric Yuan, who was motivated by the challenges he faced while travelling long distances to visit his girlfriend. The need for a reliable video meeting platform drove him to develop Zoom. Over time, Zoom has gained significant popularity among various sectors, including schools, banks, healthcare professionals, and government agencies worldwide.

However, Zoom has also faced criticism regarding privacy concerns and security vulnerabilities. The CEO of Zoom acknowledged that the platform's increased usage during the pandemic exposed some of these issues. Efforts have been made to address and improve security measures and Zoom continues to work on enhancing user privacy and data protection. Despite the controversies, Zoom remains a widely used platform for online meetings and communication.

4.4. Conclusion

By conceptualizing findings as a productive encounter between theories and data, and individuals as both humans and technical objects, this chapter underscores the dynamic and transformative character of the research process. It emphasizes that theories and data have the capacity to mutually inform and enhance each other, thereby fostering the creation of fresh insights and new analytical pathways.

Introducing both individuals and technical objects in the same section aligns with the flat ontology introduced in the theoretical chapter, opening up the relational ontology in the subsequent chapters. It allows me to focus on the details of the thresholds, and on

what emerges from the relations they create together. Additionally, this chapter laid the groundwork for the exploration of the agencements in Chapter 5.

Chapter 5. Threshold One: Individuation, Sociogenic Principle and Concretization in Action

5.1. Introduction

By analyzing the power dynamics within the various agencements that involve humans, technical objects, affectivities, and institutions (such as post-secondary schools or workplaces) among others, this chapter aims to gain a deeper understanding of the complex relationships at play.

The chapter is divided into three sections. The first vignette “First Encounters with Technical Objects” relies on the memory of the human participants regarding their first time using a technical object, whether it be a computer or a mobile phone. The analysis then connects participant memory to the literature about design and how the figuration of the “average user” emerges.

The second vignette, “Entangled Processes of Individuation and Concretization” relates Gary’s narrative to how the processes of individuation and concretization are intertwined over several years. From these two processes in action emerges concepts of datafication.

The third vignette, “Learning Through Technical Objects: Encounters with Algorithms” features Abel in which he describes learning about financial literacy through TikTok. The analysis delves into how algorithms shape the display of the content consumed by Abel and questions what Mackenzie and Bhatt (2019) call the epistemology of ignorance.

Each vignette is accompanied by my graphic rendering of it. They are transitory and are intended to orient the reader to the participants in each vignette, both individuals and technical objects.

5.2. First Encounters with Technical Objects

This vignette exposes how and when participants come into relation with technical objects. As seen in the theoretical part of this dissertation, both individuals and

technical objects are shaped by stories and values providing a conception of the world. Sylvia Wynter (2001), relying on Frantz Fanon (2008) explains that each individual is hybrid, merging the bios, the body and their relationship to the milieu, and the mythos, how each individual conceives the world and their position in it. Gilbert Simondon (1958) also acknowledges that technical objects are shaped by stories providing them with values and locating them in specific cultures. Through this vignette, the experiences of Miles and Dave are explored as they recall their initial encounters with technical objects. This section examines how they refer to different stories that influence this relationship before relying on other participants to extend the investigation on what can be considered as the meeting point of individuals and technical objects, the design of the interface. The analysis then focuses on what designers conceive as “the average user” and diffracts on how participants of this research fit this target user.

Despite the pervasive idea that individuals nowadays are born knowing-being with technical objects or are “digital natives”, all the participants of this research express that they clearly remember their first encounter with technical objects. Their narration renders the concretization of these objects through time, from the bulky desktop which sat in the family room to the mobile phone that now fits into their pocket.

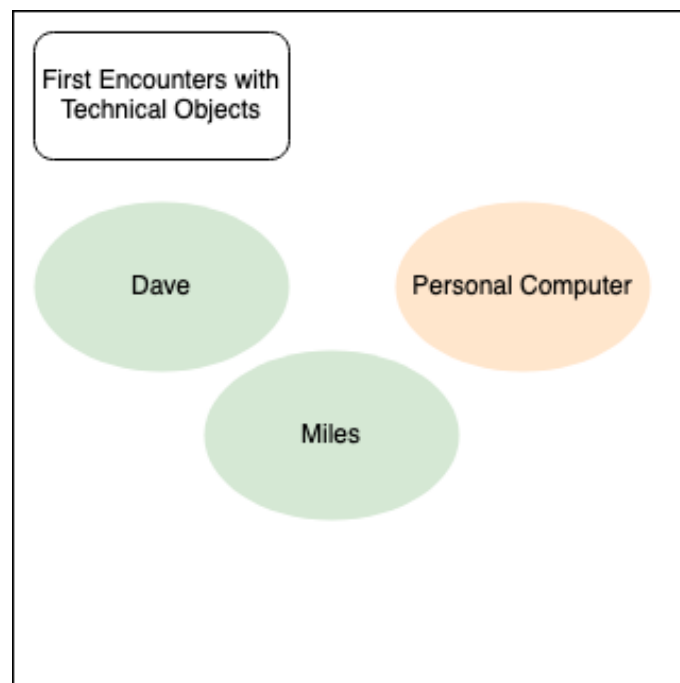


Figure 3: Participants of the vignette 1: Miles and Dave

5.2.1. Vignette 1: Miles and Dave: How Sociogenic Principle Meet the Imaginary of Technologies

Miles is a 16-year-old young girl who arrived from the Philippines in the early stages of the pandemic in Canada (February 2020) with her little brother, Green, and her father. The family joined her mother who arrived in British Columbia a few years ago.

Before arriving in Canada, Miles explains that she was already familiar with the North American culture as she used to watch movies and cartoons in English, with her brother Green. For Miles, understanding English and watching North American cultural productions helped her become familiar with what another participant, Dave who came from China, calls “the Other world.” At only 18 years old, he remembers:

When I was young, I watched TV, and that was about the main mode of getting to know the “other world”. There was no cell phone, no iPad. When I became slightly older, maybe seven or eight or nine, I started to get to know about the computer, the desktop, not the laptop. I learned how to surf the internet, how to make documents, that kind of thing, how to get information by searching. And then after a few years, I see that a lot of other students of mine in elementary school, they have cell phones. I didn’t really have a cell phone until maybe 11 or 12 or, or so. [...] But when I was 12, I acquired an iPad, which I still keep today. [...] Then, there’s a laptop because as a student, I realized that high school students need to do research to do all sorts of things on a laptop. Otherwise, they may not have survived if not, you know they cannot do school successfully if they don’t have some reliable devices. (Dave)

Like Dave, Miles remembers clearly her first encounter with digital devices:

Our first computer back in the Philippines, I did not even know that laptops really existed. It was a very bulky monitor CPU. Very loud. I used to play games on it a lot. I didn’t even know that it was important. I just liked it. I just used it mostly before to play games. I actually learned chess through the computer because it taught me how to play chess and I played. And I was just naturally good at finding the controls, how it works. I don’t really ask people how to do it. I just kind of press things, test them out. And then oh, that does that... It registers in my brain. And now I know how to use them. (Miles)

As she started to get familiar with video games, Miles now spends most of her time on technical objects learning language programming skills and communicating with friends, whether on her personal laptop or her mobile phone.

Dave also mentions some easiness in learning how to use technical objects:

I think it was pretty intuitive because I just saw that you click on certain buttons, you swipe around and then everything is fine. [...] And I think for technology, for all the unfamiliar apps or the unfamiliar procedures, I had to learn about, like how to set up email how to set up this account and that I just learned from intuition. (Dave)

In this vignette, both Miles and Dave clearly remember their first encounter with a technical object and the material evolution over those years, from the bulky familial desktop to the personal mobile phone. If they both acknowledge the North American origin of this technical object, they do not express any difficulty in using it and learning about it through trial and error. The following analysis focuses on how the individuals in this research adjust to the technical objects and how these encounters and strategies are taken into consideration through the design of the technical objects. I rely on the sociogenic principle as detailed by Wynter (2001) to think about the narration of Miles and Dave and turn toward the insights from Simondon (1958) when he details the mode of existence of technical objects, as well as Benjamin (2019) and Noble (2018), to understand how it affects the concretization of the technical objects.

5.2.2. Adjusting to the Concretization of Technical Objects

Both Miles and Dave talk about television as their first incursion into the digital realm in their life, and how it became familiar to them, what Dave calls “the other world.” This expression acknowledges the incursion of one culture into another. It occurs specifically in the family house through technical objects, starting with the television. The incursion is not geographically specific as it occurred to both Miles in the Philippines and to Dave in China. Miles explains watching cartoons with her brother helped them to become familiar with what Dave calls “the other world,” and later, in Canadian society through speaking the language. Being familiar with language is therefore a strong requirement to learn how technical objects work. As she narrates her first encounter with technology, Miles explains how smooth it was, making the connection with the North American culture she was already familiar with through television.

As several participants express, the first encounter with digital often occurs on familial devices. Despite their young age, Miles and Dave clearly remember the evolution of technical objects from the television and then, the bulky computer, which

was in the family lounge, to the laptop, tablet and mobile phone that they use now. When Dave details the changes in the technical objects, he recounts how he has adjusted to each of them.

Miles also remembers how she learned the controls of the game she was playing. Indeed, like others, her first memory of digital practices was playing games on a computer before moving to other activities such as programming and communication. She remembers becoming familiar with how the different applications were displayed on the bulky screen. If Miles was playing Chess, Sky, a 25-year-old from Iran, was playing Snake or Minesweeper. All these games are already installed on personal computers whether on Microsoft Windows or the Macintosh OS platforms, both North American products. As Gilbert Simondon (1958) reminds us, these technical objects, games installed on personal computer, are not neutral tools but convey specific values and culture of their technical milieu, namely from North America.

For most of the participants, this first encounter occurred while they were in elementary school. Only Gary mentions that his first engagement with digital devices occurred while he was in high school when his parents bought him an iPod touch. Nonetheless, only a few participants remember having computing courses at school such as Shiva, a 17-year-old, who recalls having workshops about being safe and “smart” (sic) on the internet or how to analyze information. In her introduction to digital practices, Miles does not mention receiving any help from her parents or the school. Few of them mention receiving any guidance. Only Rosa, an 18-year-old, says that her parents provided direction on how to use digital devices “correctly” and to behave in a “safe way”. These discourses, from parents or schools, focus primarily on developing the individual skills of the child and often remain silent on the values shared by technical objects.

Both Miles and Dave describe their learning process using adjectives such as “natural” or “intuitive.” Miles also explains that the computer taught her how to play, acknowledging the process of transmission in this learning process. Dave describes clicking on buttons and watching others do this. But this reciprocal relationship can sometimes be hidden. For example, Amy, a 21-year-old, seems to not remember learning about digital devices: “I just use it like it’s quite intuitive I think the interface is quite easy to use although I wouldn’t say I’m the most tech-savvy.” As she gets familiar

with the interface, she believes that learning to use digital devices or applications is accessible even without being technically versed. In this case, she adapts her use to the interface, which allows her to become quickly familiar with different elements such as icons, and buttons which barely change from one app to another.

As seen above, participants often use expressions such as “intuitive”, “logic”, and “user-friendly” to describe the digital interfaces they use, underlining what they perceive as easy access and understanding how to use new services and apps. In these cases, their learning processes involve trying things, pushing buttons, or watching videos on YouTube, for example, to understand the interface. The user-friendliness that participants experience allows them to be confident enough to try things by themselves: if they tap or click somewhere on the app, they receive feedback guiding them on the path of the expected outcomes. If they don’t know how to proceed, they can refer to friends or older siblings or, as mentioned, videos on YouTube or Google. In so doing, participants not only adapt to the interface but also their peers as Gary clarifies that he “socially learned” digital interfaces. Also, Green explains that when he does not know what to do, he asks Miles, his older sister. This suggests that participants not only learn technical aspects but also modulate their skills and behaviours based on their peers to acquire knowledge.

The design of these apps, their user-friendliness, and their intuition facilitate the learning process of interviewed participants when navigating the specific tasks outlined by the developers. However, in contrast to this, when I volunteer at NextTown, I often encounter individuals who struggle with digital interfaces. They find the iconography, overall design, and even the concept of the Internet itself unfamiliar, non-intuitive, and lacking in user-friendliness. The choices of icons and the terminology used may even appear intimidating to them. Consequently, the learning curve for individuals in this setting is notably different. Frequently, learners in NextTown question the purpose and method behind the interfaces displayed on the screen.

Based on interviews and observations, it appears that what seems to be intuitive for some individuals may not be the case for others. This raises questions about the idea of intuitive interfaces or user-friendliness and how they impact access to technical objects and their content. The varying levels of familiarity and ease of use can either

enable or hinder individuals from effectively utilizing and engaging with these technical tools.

5.2.3. How is the User Taken into Consideration by the Design?

This section focuses on the design of technical objects, their materiality, and how they influence the learning and use by the participants.

The familiarity expressed by Miles, Dave, and other participants in their interviews regarding the devices and their intuitiveness can be attributed to the design of the technologies they interact with. The term "user-friendly" frequently used in conversations implies that even highly advanced technology should appear simple and unobtrusive. However, there exists a disconnect: as technologies become increasingly sophisticated and their underlying code more opaque, the interfaces of these objects strive for simplicity and ease of use for the average person.

In the process of learning how to use an interface, the traditional user manual is often replaced by a more hands-on approach. Sara Ahmed (2019) argues that the presence of an instruction manual can be interpreted as an indication of a prior lack of user-friendliness in the design of the object itself. "In the case of a well-designed object, it should be obvious from the object how to use it" (p. 57). The idea behind this perspective is that a user-friendly design should prioritize simplicity and clarity. Users should be able to understand how to interact with the object by observing its form, layout, and visual cues. When an interface is designed effectively, it should guide users naturally through its features and functionalities, eliminating the need for extensive written instructions.

In the design process, feedback is important as it allows designers to communicate with their users and provide guidance on how to use the object. Feedback allows the user to adapt their learning in the use of the technical object according to its design and behave accordingly. The design also enables a sense of reciprocity and collectivity, allowing the transduction of the practices and values shared among users but also between humans and machines. In so doing, possible interactions are envisioned and constrained by the designers of the interface, leaving the user with few possibilities for what Michel De Certeau (1991) calls "poaching" the technical object. In

his key work, "The Practice of Everyday Life," the French scholar refers to poaching as the act of appropriating and reinterpreting the intended uses and meanings of spaces, objects, or systems. It involves a kind of resistance or counterplay against the strategies imposed by institutions or in the design provided by the technical objects. By poaching, individuals assert their agency and find ways to subvert or repurpose existing structures for their own needs. In Gilbert Simondon (2005)'s individuation, poaching allows the unpredictable to happen and to be productive of practices, meaning and values.

By adopting the "adequate" behaviour on the device, as envisioned by the creators of the technical object, the individual adapts their mental model to it. Kuang and Fabricant (2019) describe mental models as an intuition we have about how something works, and how its pieces and functions fit together. They are based on existing knowledge, what has been used before by the individual, what is already familiar, and what can consequently help make sense of a new function. For example, when the first personal computers were introduced to secretaries who were already familiar with typewriters, they had a head start in using the keyboard. Their existing knowledge of typing allowed them to quickly adapt to the computer keyboard and begin using it for word-processing tasks. The keyboard served as a familiar interface, as it retained a similar layout and function to typewriters. This familiarity with typing enabled secretaries to focus their attention on exploring and discovering the newer aspects of the computer, such as formatting options like bold, italic, or underline. Since secretaries were already proficient in typing, they could devote their attention to understanding how to access and utilize these formatting functions on the computer. They could intuitively recognize that certain key combinations or menu options could enable formatting changes in the text they were typing.

Following the same idea, when Miles and Dave explain that thanks to North American TV shows, they were able to smoothly transition to digital devices, they acknowledge this specific mental model: they were becoming familiar with the use of images, vocabulary, and metaphors specific to this culture and consequently, were able to adjust their mental models to these new technical objects. In other words, thanks to their knowledge coming from TV shows and languages, they were mentally prepared to make sense of these technical objects. The role of mental models is crucial in learning: "Mental models simplify learning, in part because the details of the required behavior can be derived

when needed. They can be invaluable in dealing with unexpected situations” (Don Norman, 2013, p. 70).

5.2.4. Toward the Average User

The term “user-friendly” is often used by participants to emphasize how easy it is to become familiar with an interface. However, what seems user-friendly to some may not be the case for others. It is indeed crucial to recognize the question of who is envisioned as the user when attempting to define user-friendliness. The term “user” itself can be problematic as it tends to reduce individuals to passive recipients or consumers of technology, disregarding their agency as active participants. This reduction overlooks the fact that individuals interact with and utilize technical objects or services in diverse ways, shaped by their socio-cultural, economic, and environmental contexts.

By solely positioning individuals as users, there is a risk of obscuring the influence and control held by those who design, develop, and maintain technical objects. This power dynamic can impact the design process and potentially limit the involvement of users in shaping the technology they interact with.

Moreover, the term “user” homogenizes individuals, failing to acknowledge their unique sociogenic principle that shapes their interactions with technology. Socio-cultural, economic, and environmental factors significantly influence how individuals perceive and engage with technology.

Understanding the characteristics and preferences of the “average user” has often been the focus of design efforts. By shaping the interface and user behavior based on this “average user,” designers aim to create user-friendly experiences. However, it is important to recognize that this approach may overlook the diverse needs and experiences of individuals who fall outside the “average” category. As Kuang and Fabricant (2019) remind us “[...] even as the designed world shapes us, its inner logic remains almost totally absent from daily conversation” (p.14).

In the design literature, the user has a central role in the process and the term “user-centered” is ubiquitous. One of the most popular design processes in Silicon Valley is used to shape both products and processes (Katz et al., 2015). Eloquently called “Design Thinking”, it benefits from five iterative stages: Empathize with the

prospective user, Define the user's needs and problems, Ideate, Prototype and Test the final product. The first stage, empathy, aims to understand the problem the design will try to fix by putting the designer in the user's shoes and accessing their mental model. In this sense, the design of the interfaces never changes radically from one version to a new one. The changes are slowly embedded in a new version of an interface to avoid any disturbances in the mental models of users.

Interfaces also refer to metaphors which shape our lives on a computer: we have a desktop with a garbage bin and a notepad, and we navigate on the internet. These metaphors can be used as texts or icons that seem so familiar that we don't question them: clicking the floppy disk to save or accessing the search function through the magnifying glass. They help to make the unfamiliar familiar, or different processes quite similar. Digital metaphors happen also in the mundane language such as "just google it," expressions that Amy and Sahil use during their interviews.

From the beginning of the personal computer until now, with several apps downloaded on our devices, the "average user" as designers call them, and encompassing the characteristics of the target user, is at the crossroads of real users and designers. If Douglas Engelbart, who is known for his work on funding the field of Human-Computer-Interaction, envisioned the user as a "knowledge user", it was Alan Kay, who, as a significant contributor to the emergence of the GUI (Graphic User Interface), developed the interface with the idea of a child in mind. Inspired by his "average user", he conceptualized the graphic interface, and how it would work by "doing with images makes symbols" such as icons. (Lesage & André, 2017)

To make a "user-friendly" interface, designers rely on what is already familiar, in terms of processes but also of symbols, to the prospective user. Consequently, questions such as who is envisioned as a user and who is not, arise. Lenhart and Owens (2021) explain that:

Companies tend to design products with an imagined "average" adult user in mind, but this approach can leave out youth and other subgroups who do not fit that mold. This is the most critical organizational omission [...], one which underpins many of the flaws in the product design process. (p. 19)

In other words, Miles as a teenager arriving from the Philippines or Dave from China, are not envisioned by designers as “the average user”. To use the technical object, they then need to conform to the behaviour of who is the average user. If this adjustment may appear natural to Miles or Dave, it is nonetheless the expression of a power relationship in the sense that the effort relies on the individuals and not on designers to conform. To summarize, as Lenhart and Owens (2021) acknowledge, “Unless a platform is explicitly aiming for adolescent and young adult users, youth are an afterthought” (p. 17).

Scholars such as Ruha Benjamin (2019) and Sasha Costanza-Chock (2020) argue that several communities and their needs are hidden in this “Design Thinking” process. As sociologist Benjamin (2019) reminds us about the first step of the “Design Thinking” process, “Empathy makes businesses grow” (p. 306). In this process, she asks which humans are prioritized and calls upon designers to be self-critical.

Indeed, most of the time, developers refer to their own needs to create new functionalities. “Average” users tend to be idealized as young adults, with a large income, white and male. It consequently reflects the lack of diversity in the tech workforce. “When researching, designing, and testing new products and features, employees were mostly thinking about early adopters or tech-savvy users resembling the employees themselves. These users tend to be adults, higher-income, white, and male” (Lenhart & Owens, 2021, p. 19). The authors further outline the exclusion of the Black workforce in Silicon Valley as well as frequent acts of discrimination toward Asian workers (p. 22).

In this case, digital devices that prioritize user-centred design tend to focus on the needs and problems of specific groups of people, while neglecting others. By doing so, designers not only overlook the needs and sociogenic principles of certain users but also contribute to the sidelining of individuals whose stories diverge from the dominant narrative within the technology industry.

By imposing a specific model or framework through the design of daily interfaces, users are expected to conform to a particular way of being and performing within the digital realm. This can create barriers for individuals who do not fit within the prescribed norms and can perpetuate inequality and marginalization.

As Dave, a participant in the research, would say, this design approach essentially imposes the perspective of “the Other world” that may not reflect the diverse experiences and identities of the users. It fails to account for the multiplicity of stories, needs, and sociocultural contexts that shape individuals' interactions with technology.

A significant disjunction can arise when the actual user is different from the user envisioned, generating discrepancies and/or discrimination such as those that Ruha Benjamin (2019) describes. More generally, these interfaces, by not considering the diversity of users, remain silent and oblivious to the sociogenic principle which contributes to the individual constitution.

In summary, this vignette brings attention to the power dynamics inherent in the initial encounters between young participants from different parts of the world and technical objects predominantly designed and developed in North America. These encounters position the participants as users of these technical objects. While these objects enable individuals like Dave and Miles to become familiar with the "other world" and its specific sociogenic principles, the design of these technical objects often fails to acknowledge or recognize the participants' sociogenic principles and individual stories.

While these technical objects facilitate the participants' ability to learn about and understand new cultures and perspectives, it raises the question of what happens to their own stories and conceptions in the process. The design of technical objects tends to prioritize certain narratives and perspectives, potentially overshadowing or marginalizing the diverse experiences and sociogenic principles of the participants.

The following vignette describes and analyzes the long-term relationship between Gary and one of the platforms he has used for several years through the intertwined processes of individuation and concretization. From this relationship emerges an analysis of the process of datafication.

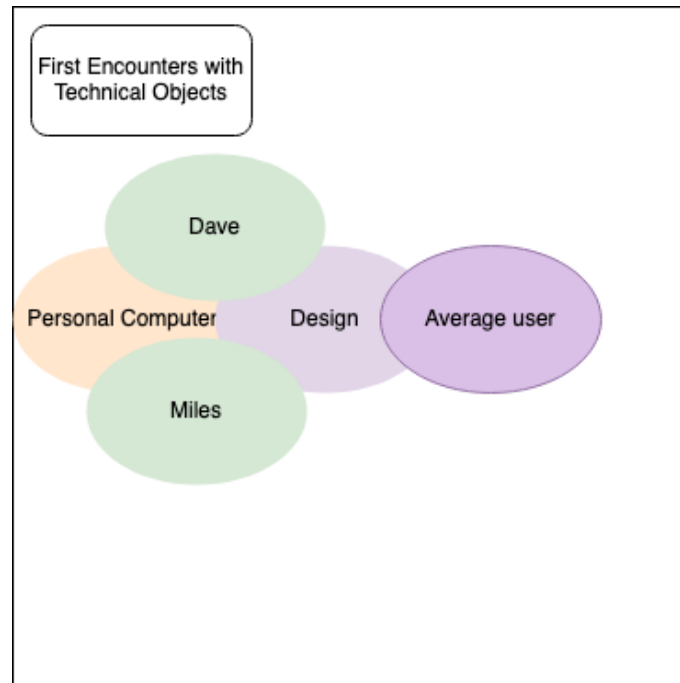


Figure 4: What emerges from these relations in Vignette 1

5.3. Entangled Processes of Individuation and Concretization

As I noted above, the individuals encountered during this research have grown up surrounded by digital technologies. In a short amount of time, they have learnt how to use them for several purposes in their everyday lives and how to adjust to new technical objects, from desktop computers to mobile devices. As participants are individuating, technical objects are concretizing resulting in some tensions being resolved while others appear. Recalling that Simondon conceived both individuation (2005) and concretization (1958) as dynamic processes that unfold over time, we see in this vignette how tensions are (re)solved in relation to other individuals and/or technical objects.

Indeed, as an overall acknowledgement, all the participants of this research are evolving in relation to technologies. The interviews and most of the observations were made during the pandemic when there were several restrictions, such as social distancing, social gatherings or activities. Some of the participants like Miles and Green had just arrived in Canada only a few weeks earlier. Others like Dave, Sahil, Gary and

Sky were in a year gap before going back to their studies. Some were looking for a job, such as Beah, Gisele and Abel.

In this section, processes of individuation and concretization are analyzed through the narrative of a participant, Gary, who was particularly detailed in his reflections. This part focuses on the “long-term” relationship between Gary and Instagram.

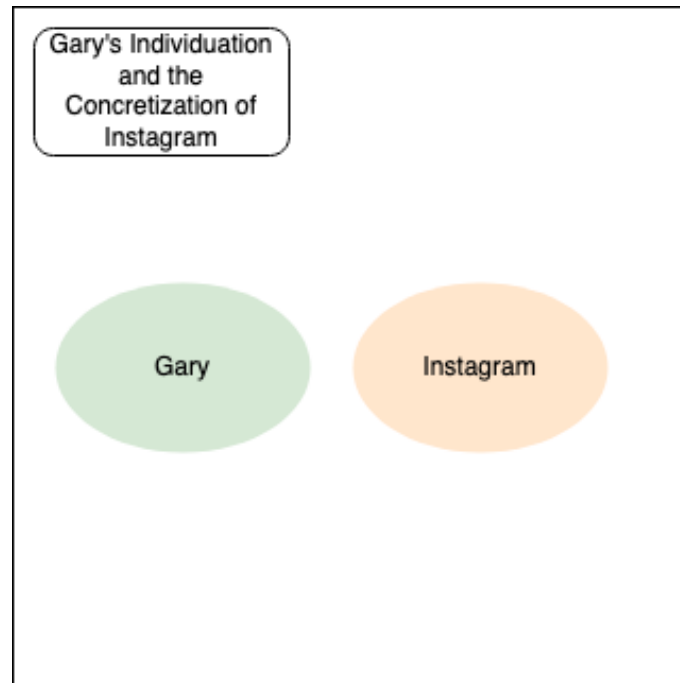


Figure 5: Participants of the vignette 2: Gary and Instagram

5.3.1. Vignette 2: Gary's Individuation and the Concretization of Instagram

Gary is a 26-year-old man born in British Columbia to Sikh parents who immigrated from Punjab, India. Throughout the interview, he makes it clear that he comes from an underprivileged background with non-educated, immigrant parents who, according to him, “barely speak English”. Gary is trying to complete the LSAT exam that he hopes would allow him to go to law school. He remembers that he first encountered digital technologies during high school when his parents bought him an iPod touch

second generation. The first applications he installed were YouTube and Kik Messenger and he remembers the first generation of Facebook (2006), Twitter (2006) Instagram (2010), Snapchat (2011). Gary was motivated to use these platforms and be active online because he did not want to be left behind at high school. "it was kind of do or die."

When he started university in 2014, he became an avid user and participant of Instagram, where Gary became what he calls "famous, a local celebrity." This new popularity changed how he behaved. As he mentioned during the interview, he started avoiding certain stores because he did not want to be recognized while visiting them.

Even if this popularity came with considerable expectation from his social media followers, Gary explains that he needed this social validation because he was lost in his schooling: "I did not have the tools to navigate post-secondary studies. I didn't know what I wanted to do. I wasn't really sure, and I didn't do well in my classes" (Gary).

The use of the social media platform Instagram answered and at least temporarily solved a tension he was facing when accessing higher education; his feeling of being lost and the social validation he was looking for. As Gary was not doing well at the university, the institution suggested he participate in a program designed to support students who had difficulty with their courses. When Gary finished this program, he took a two-semester break that helped him think about his future. Reflecting on several topics, he came to question his relationship with social media. He realized that:

You have to remove your ego to understand that, you know, if someone doesn't like your picture or doesn't really enjoy your stories, that doesn't mean they don't like you. Social media is basically socializing. Understanding that it's okay if you don't post anything today. (Gary)

At this time, in 2018, Instagram announced that they were piloting the removal of public-displayed "like" counts for content posted by other users. For Gary, this removal of the feature on the Instagram platform addressed an issue of common concern among his peers: chasing and increasing the number of likes for what they posted. According to Adam Mosseri, the CEO of Instagram, the reason behind this change is that the platform wants "people to worry a little bit less about how many likes they're getting on Instagram and spend a bit more time connecting with the people that they care about" (Shaban, 2019). After a pilot in Canada, the feature was reinserted with a "by default" option. This

means that to deactivate this feature, one needs to change the platform preferences. It remains a complex process.

During his break from social media, Gary started a new degree at another university, he stopped posting every day, and stopped chasing social validation. From his “celebrity” on Instagram, he learnt that privacy was important to him. Although he is still an avid user of different social media platforms such as Instagram, WhatsApp, Snapchat and YouTube, Gary now uses several strategies to promote privacy such as not posting anyone’s photo on any social media platform and changing his account settings to private. “I am a ghost, you’ll find my name, but you won’t see me, you won’t know anything about me or anything. These are for professional reasons, but also for personal reasons.”

On Instagram, Gary has now 25 followers and knows each one of them. He considers them as family and follows them back. Other than that, he follows 170 meme accounts, singers, celebrities like Drake whom he sees as a social activist, and some creative photography accounts: “Entertainment, news, and a little bit of a kind of social activism.” He follows international news, mainly from North America and Punjab.

5.3.2. Gary’s Individuation

Gary’s first encounter with digital technologies, which happened when he was in high school is a moment of individuation. Even though his parents bought him the iPod, he uses the expression “socially learned” to explain how he acquired the knowledge to use the device. This learning was deeply motivated by what Gary felt was peer pressure in expressing “It was kind of do or die.” He felt he had no choice but to learn how to use digital technologies if he wanted to be included in his peer group. The technical object here is significantly more than a tool as it allows Gary to address several tensions emerging from this pressure. The first one occurs between him and his family as he acknowledges that his familial environment would not help him learn how to use this device either technically or ethically.

The second tension that Gary mentions is the pressure to belong to a group: the acquisition of the device allows Gary to be part of his peers’ world, which he perceives as having a more similar cultural background that aligns itself with technical objects.

Significantly, the two apps that came with the iPod were YouTube, the video-sharing app, and Kik Messenger, a messenger and chat app, both developed in Silicon Valley, North America. From his comments about his parents, Gary acknowledges, that the learning and use of digital technology can be a locus of discrimination for people whose language and values do not align with the ones conveyed by digital applications. His way to solve this potential source of discrimination was to learn through his peers how to use these objects and the cultural way of being they convey.

The iPod is positioned as a transductive device that helps alleviate the tensions contributing to Gary's psychic and collective individuations. Its significance extends beyond mere device usage, encompassing social behaviour, communication with peers, and understanding diverse cultural aspects and values that he had been exposed to previously. This individuation opens new potential for Gary such as learning in depth the organizational logic of social media. He remembers the first generation of several popular apps that he is still using today. This familiarity with applications allows him to be part of the group and not "die" socially and culturally.

Another significant moment of individuation that Gary experienced was when he started university. He attributes this issue, once again, to a lack of familial support. In his own words, he expressed uncertainty about his location and sense of belonging. He described himself as being scattered, exploring various avenues including social media, particularly Instagram, where he achieved a level of "fame." Instagram provided him with a means to alleviate the tension he felt—a disconnection between his family and his future—and offered a form of "social validation," as he calls it, that was lacking from his parents and friends. It is important to note that Instagram did not act as a substitute; rather, Gary discovered a validation through its use that he couldn't find elsewhere.

This social validation was materialized on Instagram by the number of followers and likes that he received on his posts. However, the ubiquity of this practice in his daily life was also triggering additional pressure and expectations placed on him. In so doing, Gary not only aligned with what the Instagram platform favored as social validation but was actively co-producing it.

5.3.3. The Concretization of Instagram

Gary reminisces about the initial era of social media, specifically mentioning Instagram, where he attained the status of a "local celebrity." This recollection establishes his long-term connection with Instagram and positions Gary as an engaged observer of the platform's evolution. Consequently, this section will concentrate on tracing the development of Instagram from its inception up until my interaction with Gary in the summer of 2021.

Benefiting from both older photographic technologies such as the Polaroid camera and the integration of digital cameras into smartphones, Instagram was launched as a quick point-shoot-share photo mobile application (Duguay, 2017a) in 2010 and was rapidly acquired by Facebook (now known as Meta) in 2012. It enables sharing either a photo or a video, which can be enhanced by filters provided by the platform, enabling the transformation of mundane pictures into unique and artistic photos. Unlike Twitter or Facebook, using Instagram allows the user to follow other accounts without the permission of the followed account and with no expectation of being followed back. As Stefanie Duguay (2017a) contends:

Instagram invites users to exhibit their transformed photos next to iconic and celebrity users' images displaying their lavish lifestyles. This positioning appears to offer a level playing field upon which everyday individuals can attain celebrity styles and potentially draw similar amounts of attention. (pp. 99-100)

She further explains that Instagram, through its functionalities, valorizes certain photographic techniques and references to upper-class lifestyles. Here, pictures are not only used to create or maintain connections between users but to blur the divide between everyday users and upper-class personalities. This phenomenon that Alice Marwick (2015) calls "instafame," is defined as a mindset and a collection of self-representation practices in which users strategically formulate a profile, reach out to followers and reveal personal information to increase attention and thus improve their online status. Consequently, each post involves a decision about aesthetics but mostly, the photos shared aim to be meaningful.

On these photos, Instagram users can scroll down, like or comment on the posts. If clicking the like button is meaningful for the ones who posted the picture as Gary

underlines, it is also particularly important for the developers of the platform as it allows them to capture data from the user of the app. As Burgess et al. (2018) remind us, the functionality “like” on social media is now seen as a universal currency particularly important for advertisers as Instagram can not only improve the application but also monetize the collected data. Alice Marwick (2015) explains that often, users like:

[...] what they find “aspirational”: marketing jargon for something people desire to own but usually cannot. What the young users of Instagram find aspirational often resembles “the lifestyles of the rich and famous.” Thus Instafame is not egalitarian but rather reinforces an existing hierarchy of fame, in which the iconography of glamour, luxury, wealth, good looks, and connections is reinscribed in a visual digital medium (p. 141).

Instagram’s ambition is then to favour the use of the like button or any interactions that enable the data capture of the user. The addition and removal of features can then be seen as a way for Instagram to retrieve additional data. This concretization takes also place in a highly North American competitive market. For example, in 2016, Instagram launched “Stories.” It consists of sharing photos and later videos for 24 hours only and allows Instagram to compete with Snapchat. Another important feature was introduced in 2020 named “Reels”. It works by sharing short videos and enables Instagram to open up markets in countries such as India where TikTok was recently banned.

But, to ensure the increase of collected data from a rising number of users, these social media platforms also need to conform to North American laws, policies and regulations. Besides the removal and reappearance of the like counter as an option, other features from Instagram have been implemented to reduce harassment and negative comments (Mosseri, 2019).

This overview of the platform's development illustrates its ongoing adaptation to the technicity of North American society, encompassing aspects such as business models, public image, and legal responsibility. The constant adjustments highlight social media in relation to social processes in North America and news social media policies emerging from them. Gary and the other individuals I interviewed are not oblivious to the fact that the intentions of social media platforms are focused on commercial motivations. Their analysis links the technical object to the dominant economic and political system in which we live, recognizing the imbricated systems in which we evolve. The ability of

social media to capture new norms has implications for individuations of Instagram users.

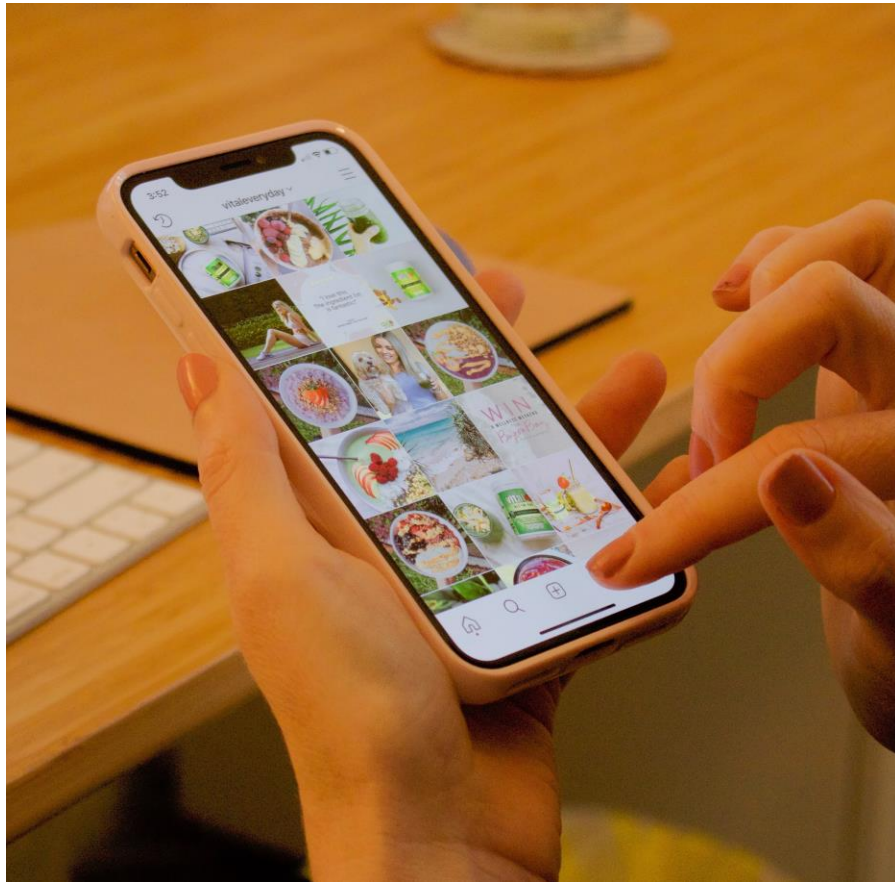


Figure 6: Interface of Instagram
Photo by Gabrielle Henderson on Unsplash.com

5.3.4. Datafication as Emergent from this Relation

As seen above, Gary is individuating through Instagram, resolving tensions while the logic of concretization of the social media application is more oriented toward the North American economic, cultural, and political environment.

These two processes are productive for both participants. Gary manages to temporarily resolve tensions while triggering others and consequently individuating. Instagram also relies on Gary's intensive use of the platform to concretize new features and enacting the perpetual generation of data. Although these two performances are not developed in parallel, they are relationally constructed. Each needs the other to evolve.

However, these processes are not symmetrical. If Gary's psychic and collective individuation is enabled through the platform, the stories that shape Instagram as a North American product can conflict with Gary's stories, in what Sylvia Wynter (2001) calls the sociogenic principle. This triggers new tensions.

Indeed, Gary uses the identities, codes and values favoured by Instagram, which allows him to be a "celebrity" as he defines himself: dining in restaurants, wearing fancy clothes... In doing so, he adheres to a certain idea of the lifestyle of the rich and famous, as Alice Marwick (2015) wrote. But as is already documented (Carrington, 2018), every action that Gary takes using digital devices that produce information becomes data, which is stored, linked, categorized, and analyzed by the social platform. According to Pybus and Coté (2022), personal data can be categorized using a tripartite model. This model includes data that are produced, referring to what users produce and upload about themselves; observed, involving what can be learned from engagement; or inferred, meaning what can be predicted from user engagement. Indeed, the true power of these platforms lies in the collection of data that occurs without our knowledge. This includes information such as our location, the duration of our interface usage, the content we consume, and the duration of our engagement with that content, the observed and inferred data (Pybus and Coté, 2022)

In Gary's process of individuation through Instagram, we can observe his development as both an individual and a "user" in relation to the platform's interface. While Gary is empowered by social validation, the platform itself benefits from the data generated through consciously entered information, such as keyword searches and lists of followers or accounts followed. As Mayer-Schönberger (2013) reminds us, datafying a phenomenon to put it in a quantified format to further analyze it, is called datafication. As Pybus and Coté (2022) explain"

Datafication, a process that is rendering our social, cultural and political lives into actionable and productive data points is intensifying. On the one hand, this is about the quantification of our everyday lives to generate new forms of value, but it is equally about unlocking multivalent potential that lies dormant within the materiality of our data. (p.1650)

The accumulation of this data contributes to the formation of what Olga Goriunova (2019) refers to as a "digital subject." Goriunova uses this term to describe the performance and constructed persona that emerges from the aggregation of data,

profiles, and other related elements. In the context of social media platforms like Instagram, the data collected from users' activities and interactions is used to create a digital representation of the individual. She wonders about the relationships between the data generated and the individual.

Gary's narrative is about a young man born into a Sikh family who immigrated from the Punjab, and living in Canada where data are collected from him, and produced in California, United States, for a marketing purpose. During the research, several participants expressed concern about how the data generated from their activities quickly moved outside their sense of control, and their self-awareness, and change, for example, their perception of privacy. Among them, Mark explains that:

I don't think there is any more privacy with all these technologies we have. It's just impossible to have some kind of private life. Because, I mean, if you just go to Google and just download your footprint from Google, you will be just shocked by what Google has on you. (Mark)

But the data retrieved do not limit themselves to what the user enters willingly as Silas discovered:

There is really no escaping because I am pretty sure that Facebook knows not only who I am, but they know my race, my sexual orientation, because I do see ads that kind of apply to me, the same thing with Google. (Silas)

Some participants, like those who arrived from China or Iran for example, express that they feel surveilled by both governments and private companies alike. All participants are concerned by the amount of data they are unwittingly providing that is not under their control. They feel like they are dispossessed of the ability to regulate what emerges as data. Nonetheless, for a few participants, providing data as they "have nothing to hide" is not a concern, as they expect that the only possible outcome can be to receive advertisements. To mitigate concerns about protecting their privacy, some use tactics such as tweaking settings on the different platforms that allow them to do so.

Even though privacy is deemed important by the participants, they often feel quite defenceless against various apps and digital devices, leading to a sense of fatalism. Kevin, for example, expresses his feelings of powerlessness regarding this issue:

I always try my best to turn off all the privacy options. I try not to use Google as much as possible, maybe use like DuckDuckGo or something. I try not to use Facebook because Facebook is really bad, so I don't have Facebook on my phone, but Instagram is the same company [laughs] I just kind of lying to myself. (Kevin)

Several participants feel the power imbalance relation regarding control of their data. As D'Ignazio and Klein (2020) remind us, data are far from being neutral, "[...] using data about people as an input into a system: the data are never "raw." Data are always the product of unequal social relations—relations affected by centuries of history" (p. 55).

But the issue is two-sided and as Rob Kitchin (2014b) explains, the data collected "are not independent of the thought system and the instruments underpinning their production" (Bowker and Star 1999). And such thought systems are infused with philosophical assumptions and beliefs and are differentially practised" (p. 14). As we have already observed in the design of technical objects, these systems are typically created by fairly homogeneous groups of individuals, as noted by Lenhart and Owens (2021):

These companies employ many more men than women, especially in technical roles, and the vast majority of employees identify as either white or Asian (while comprising a large percentage of the tech workforce, "Asian" is a category that represents many populations also facing discrimination in Silicon Valley). Platforms have particularly excluded Black workers. (p. 22)

The lack of diversity impacts directly which data matters as insist D'Ignazio and Klein (2020) "While equitable representation—in datasets and data science workforces—is important, it remains window dressing if we don't also transform the institutions that produce and reproduce those biased outcomes in the first place" (p.32).

Indeed, as Gilbert Simondon (1958) and more recently Rob Kitchin (2014a) underlined, technical objects, including data, are never free of values. The collection, categorization, analysis, and differentiation of data require substantial resources, which are often accessible to only a handful of the largest tech corporations like Meta and Google, as well as governments and elite universities (D'Ignazio & Klein, 2020): "These resource requirements result in data science that serves the primary goals of the

institutions themselves. We can think of these goals as the three Ss: science (universities), surveillance (governments), and selling (corporations)” (p. 41-42).

As depicted in the vignette, Gary undergoes individuation by addressing certain tensions as he documents his life through storytelling. Meanwhile, the digital subject, as conceptualized by Goriunova (2019), accumulates and consolidates data from Gary's past and present activities, utilizing it to forecast and influence his future actions. The distance generated by this disconnection between the embodied Gary and the datafied Gary is problematic for both. Instagram leverages the digital subject it has constructed to anticipate Gary's preferences and tailor the information and posts presented to him. Consequently, the platform organizes Gary's feed on social media platforms based on this predictive model.

During his two-semester break, Gary came to the realization that frequently posting mundane pictures of his everyday life was not only a waste of time but also that no one expected him to. He acknowledges that he was evaluating his social worth based on the number of likes he received which he believed did not reflect reality. The point here is to underline that the tension that Gary manifests between his social and familial background and the academic milieu found resonance in his use of Instagram.

Simultaneously, the data collected by Instagram concretizes Gary's identity as a distinct digital subject, transcending mere fragments of data. This digital subject plays a role in Gary's individuation as it influences what Gary can see or cannot see on the platform. Furthermore, it is important to note that the stories shared through Gary's digital subject do not fully represent his personal narratives but rather reflect the stories extracted solely from his data. Indeed, as Marwick (2015) reminds us: “Instafame demonstrates that while microcelebrity is widely practiced, those successful at gaining attention often reproduce conventional status hierarchies of luxury, celebrity, and popularity that depend on the ability to emulate the visual iconography of mainstream celebrity culture” (p. 139).

By adhering to the norms and expectations set by Instagram, Gary selectively represents himself on the platform, focusing on specific aspects of his individuation while disregarding others. In response, Instagram and Gary's digital subject present him with a narrative that aligns with the platform's predefined norms and narratives. D'Ignazio and

Klein (2020) emphasize the need to examine how these companies may overlook certain user groups and sociogenic principles, including young people and Black individuals.

After the break, Gary started to build a different relationship with the social media platform. The shift and Gary's attitude may seem radical going from a "famous" user to what he called a "ghost". There is no doubt that these decisions and shifts were translated into the digital subject as well as the new data which is now aggregating but not replacing the previous ones. This aggregation and normalization are still used by platforms to provide some content to Gary, and consequently, to influence his perception of the world.

Indeed, as Taina Bucher (2017) notices, "While 'real' life allows the past to be the past, algorithmic systems make it difficult to 'move on'. Algorithms and the databases with which they are intertwined make it hard to forget the past. Herein lies the politics of the archive" (p.35). For Gary's digital subject, his past may have a similar importance as his present as data are still collected and have accumulated since Gary first encountered digital platforms. As a result, the narratives presented by Instagram continue to be influenced by Gary's past experiences and interactions within the platform.

In this vignette, participants undergo a dual process of individuation and concretization, which are closely interconnected yet asymmetrical. Individuals often experience a sense of limited control over the data collected by various technical objects, creating a power dynamic where the objects possess greater agency than the humans using them. It is through this interplay of processes that the digital subject emerges, formed by the aggregation of data provided by the individual and utilized by the technical object as a reference for generating new content. Subsequently, the relationship among the technical object, the individual, and the digital subject becomes tripartite. Within this relationship, concerns arise regarding the integration of sociogenic principles. Indeed, as the vignette illustrates, technical objects have the potential to compromise or dismiss narratives that do not conform to the dominant ones.

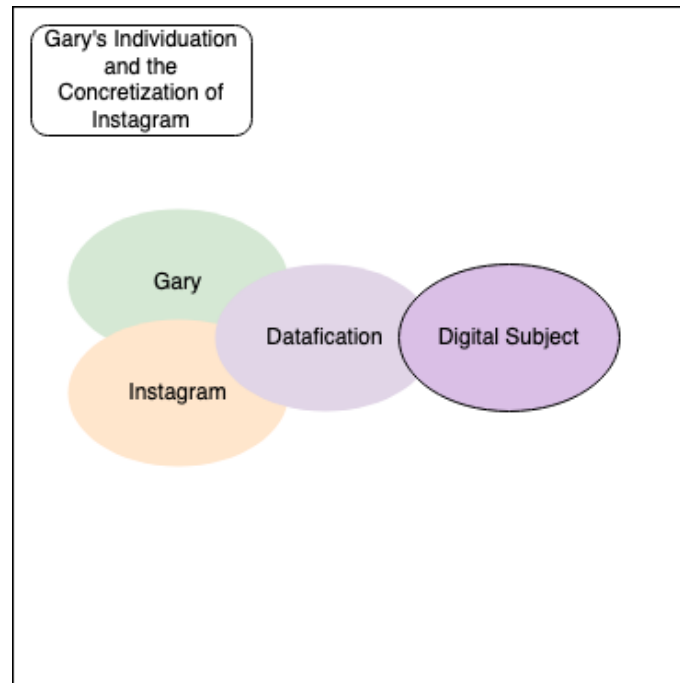


Figure 7: What emerges from these relations in Vignette 2

5.4. Learning Through Technical Objects, Encounters with Algorithms

If individuals first perceive the visual design of technical objects through their affordances (Norman, 2013) materialized by the icons, texts, and visual elements, they encounter algorithms, noticeably when they use the search functions or some platforms they use for learning purposes. Algorithms, as Tarleton Gillespie (2014) explains: “are encoded procedures for transforming input data into a desired output, based on specified calculations. The procedures name both a problem and the steps by which it should be solved” (p. 167). These procedures can be hidden from the user, as Amy explains.

I don't think I ever really learnt how to use [any applications]. If I get really confused, I would just google it like how do I [...] on Facebook or something like that and then it would show me like screenshots and how to do things so I just follow that but I don't really remember having to learn anything to get on these apps. (Amy)

This vignette focuses on the personalization of content provided by a social media platform and how content is delivered or ignored on topics of interest, what Bhatt and MacKenzie (2019) call the epistemology of ignorance which analyzes "how ignorance can be maintained, produced and reproduced through practices of digital literacy in the everyday lives of individual users of technologies within their various networks and institutions" (p. 302).

It is important to note that numerous scholars have already suggested that accurately comprehending the algorithms employed by various platforms and their corresponding actions is speculative, primarily due to the lack of visibility into them. Instead, relying on both participant interviews and literature, this section describes and analyzes how participants and algorithms are intertwined and what emerges from these encounters. In this case, I am following Loup Cellard (2022)'s suggestion of *surfacing algorithms* which is a method of making sense of algorithms at the level of their everyday appearance. Indeed, as Tim Ingold (2017) underlines: "Surfaces are important not in themselves but for what they potentially open up, and for what they disclose. But they are also important for what they hide, and for the deceit that they can practice on us" (p. 102).

User-friendliness has consequences on how participants of this research learn and become familiar with different topics as most of them express that they learn from the internet. None of the participants mentioned posting and sharing content on the internet even on social media platforms. Some, such as Kevin, answer posts or forum questions sometimes but explain that they are not initiating the post or asking questions. Nonetheless, if most of them remain discreet on these platforms, they are all active users and gather knowledge through them. In the subsequent section, we follow Abel as he discusses his experience of acquiring financial literacy through TikTok. By conducting an interview with Abel and the walkthrough of TikTok, it becomes possible to analyze what emerges from this relation in terms of knowledge and the epistemology of ignorance, as conceptualized by Bhatt and Mackenzie (2019).

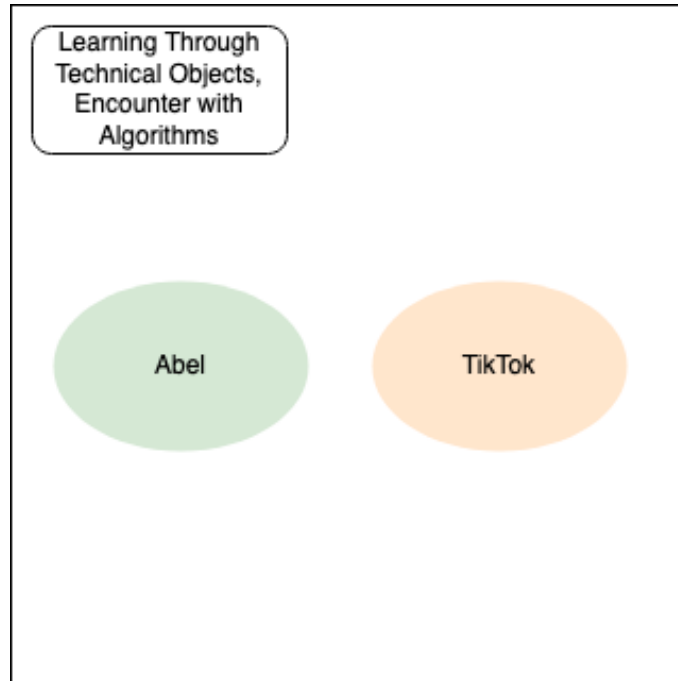


Figure 8: Participants of the vignette 3: Abel and TikTok

5.4.1. Vignette 3: Abel and TikTok

Several participants of the research explain developing their skills thanks to apps or digital devices. Yuki, for example, is learning piano from watching YouTube videos and downloading apps on his mobile phone. He summarizes learning piano as learning finger placement and when to press the key. Describing himself as a visual learner, he benefits from the visual cues that YouTube videos or apps can provide.

Abel and Gary also utilize YouTube as a learning resource. In both interviews, a significant portion of the discussion revolves around the topic of financial literacy and their endeavors to acquire knowledge in order to become more adept at investment strategies. Their main motivation is to prepare for a better future or to earn a passive income alongside their regular employment. Both told me they learn through different social media, whether on Instagram, YouTube or TikTok where they follow influencers. Gary explains that being knowledgeable about investing on the stock market is not something that he could learn from his family as it is negatively perceived by his parents:

The stock market is something I've always shied away from because immigrant parents especially Sikh and Punjabi parents, they will [compare

this to] gambling casino. It is seen as taboo [...] So the stock market is kind of a gambling [for them]. (Gary)

This excerpt underlines the generational and cultural gaps which I have found in other interviews and informal conversations with participants. Because Gary's parents are against the idea of investing in the stock market, he learns by himself, privately, through the Internet.

Abel has also taken up learning about the stock market and the financial market as a hobby, particularly during the pandemic. He acknowledges that learning through social media platforms demands time and effort, as he actively searches for reliable and credible sources of knowledge on this subject. When I ask him how he learns on TikTok, he answers:

There are some people that would talk about good stocks to invest in, but of course, I also have to do my research, look at the companies to see if it is a good company, because sometimes, some people are like... I don't know how to explain that because they pump and dump the stocks. They hype it up they make it like this is the next new thing, this is very good to invest in [...] I have been guilty of not doing my research [before] investing and then, I learnt from that experience. I wish I could do research and just not follow what people say [...] this is what I learnt from TikTok. TikTok is very [...] informative. (Abel)

In this excerpt, Abel highlights the importance of conducting further research after watching a video on TikTok to determine whether or not he can trust and follow the advice provided. During this process, he becomes immediately engaged with TikTok algorithms, which play a significant role in selecting which videos are visible and which ones are not. These algorithmic decisions are based on the platform's predefined criteria and values. Indeed, ByteDance, the Chinese company owning the social media platform, has as a mission to "Inspire Creativity, Enrich life" (on their website <https://www.bytedance.com/en/> retrieved on September 23, 2022). TikTok, through its algorithms and content display, facilitates a specific manifestation of creativity that aligns with its vision of an "apolitical environment." The platform promotes creativity by showcasing content that remains unaffected by current events or controversies (Collie & Wilson-Barnao, 2020). This is achieved through the algorithms' selective processing of data. The algorithmic processes heavily rely on the choice of which data to consider and which to exclude, making this decision crucial in shaping the platform's overall content experience. In the case of TikTok, to avoid being affected by current events, the platform

does not take into account the timestamp of when a video was created, when deciding to display it or not on the "For You" page, which serves as the landing page of the app. As a result, recently created videos can appear before videos that are several years old, without the user being aware of the chronological order. The algorithm focuses more on user engagement, relevance, and other factors to determine the visibility and ranking of videos on the platform. Abel's feed might display both new and old videos of financial advice. This can become problematic in a very time-focused market such as the financial one.

5.4.2. Personalization of the Use and the Content

TikTok was not initially designed to be a learning platform but a digital space to share users' own creativity and make it viral. As Abel explains: "I thought TikTok was about people dancing but TikTok is actually very informative, it shows you what you'd like to see" (Abel).

Indeed, TikTok is widely known for its lip-sync videos and memes. Collie and Wilson-Barnao (2020) contend that "the platform's affordances are all geared toward mobile use and the seamless integration of smartphone and micro-video creation and consumption" (p.179). Videos created on the TikTok platform typically have a duration of around 15 seconds. However, the length of a video can be extended up to 60 seconds if multiple videos were recorded externally and are connected outside of the app. This feature allows users to create longer and more intricate video compositions by stitching together multiple clips.

Abel's "non-intended" use as a learning tool is made possible because the platform allows the user to personalize what is displayed on the screen by watching some favorite videos or following specific creators. When Abel mentions that TikTok shows you what you would like to see, he refers to the actions of TikTok's algorithms which, by customizing the online experience, also favor a more targeted advertisement. Hence, TikTok's marketing slogan: "the more you watch, the better it gets". In contrast with other platforms such as Spotify or Facebook, in 2020 at the time of the interview, there was no need to put individual preferences or to specify any topics when the user registered. ByteDance explains that the platform learns about each user's interests and preferences through interactions with the content – including likes, dislikes, comments,

reports, and follows. Indeed, the more users interact with content on TikTok, the more relevant and engaging their overall experience becomes. The relevance here is that it cuts both ways. Indeed, as Darmody and Zwick (2020) remark, personalization portrays as the endorsed promise to make the internet more relevant to both users and advertisers. For marketers, it helps to omit a key operative contradiction: while platforms claim to empower their users to make better choices about what they want to see, post, share, and consume, they are actively controlling the choices available.

Even though Abel may not use the TikTok app in the conventional or intended manner, his usage still operates within the framework and limitations set by the platform. On one hand, Abel can utilize TikTok to learn about his preferred topic. On the other hand, he is aware that TikTok presents a curated selection of content to its users. The key question then revolves around the methods, values, and motivations behind the platform's content selection process.

Recently, Darvin (2022) details how TikTok algorithms work through the analysis of the landing page of the app named "For You". It is:

Populated by a recommendation engine and showcasing videos not necessarily created by those that one follows. Through powerful artificial intelligence (AI) and machine learning, TikTok instead feeds videos to the user based on real-time viewing. As one scrolls down the 'For You' page watching videos in an infinite loop, the algorithm continues to read implicit or explicit signals about how the user engages with specific content, including retention rates i.e. the number of seconds that the user views a specific video, sharing it or following the creator who uploaded it. A user can also tap "Not Interested" or choose to hide content from a particular creator or featuring a certain sound. (Darvin, 2022, p. 2)

Similar to the previous vignette regarding Instagram, the data used for personalization on TikTok is not solely limited to the information intentionally provided by the user. It also encompasses data derived from the user's interactions and engagement within the platform. This capture allows TikTok to categorize the user's behavior on the platform. Indeed, as Phan and Wark (2021) explain, personalization, what Abel refers to when he says "it shows you what you'd like to see," is never about the individual. Instead, data collected by the platform will enable it to orient the TikTok user into increasingly granular categories. As algorithms are not accessible, the rationale of these

categorizations remains obscure. The perception of freedom and accessibility that many participants express when discussing digital platforms is influenced by the underlying cultures and values embedded within the algorithms of these platforms. However, these cultures and values remain largely opaque to users, as they lack transparency regarding how these algorithms operate and make decisions. For example, ByteDance's slogan claims that its mission is to "Inspire Creative, Enrich Life," but its definition of creativity expressively excludes any mention of political events. As Collie and Wilson-Barnao (2020) explain:

This emphasis on the relationship between technology and creative, entertaining content – as opposed to social networking, news and “political” content – threaded throughout TikTok's marketing is also embedded in the technical infrastructure of the platform itself. (p. 178)

Values and cultures embedded within the algorithms of these platforms not only dictate what content is visible or hidden but also influence the visibility of certain individuals or groups. The connections formed between the content and its recipients have a significant impact on the collective individuation of participants. On one hand, these connections can address tensions and fulfill individual needs by offering relevant and personalized content, fostering a sense of belonging within specific communities or interest groups. This aspect proves especially valuable for individuals like Gary and Abel, as they may not find the desired knowledge from their family or friends but can obtain it through these platforms.

On the other hand, these connections can introduce new tensions as the algorithmic selection and presentation of content may not align with the preferences, values, or expectations of individuals. As already observed with Instagram, certain stories or sociogenic principles might be overlooked by the algorithms to the advantage of those favored by the platform, whether they originate from Silicon Valley or China. This can result in conflicts, misunderstandings, or the formation of echo chambers where diverse perspectives and content are less likely to be encountered.

The analysis of algorithms presents a significant challenge due to the inherent lack of transparency and limited access to their inner workings. We can only evaluate algorithms based on their observable outputs and surface-level behavior. However, if algorithms are often considered as black boxes (Pasquale, 2015), Taina Bucher (2017) explains that even with no accurate knowledge of how they work, users rely on what she

calls an” algorithmic imaginary” that helps them addressing the gap in their everyday interactions with algorithmic systems.

5.4.3. Algorithmic Imaginary, Influencers as Sponsors of Literacy, and Their Role in Collective Individuation

The concept of algorithmic imaginary goes beyond mere guessing from the perspective of the individual. It represents an endeavour to make sense of the underlying digital procedures and processes at work within algorithms. While participants may not have complete visibility into the inner workings of algorithms, they engage in interpretation and speculation to form an understanding of how these systems operate. Even the youngest participant, Green, 14 years old, expresses awareness of how YouTube algorithms work and evolve when underlining some limitations of what can be expressed on the platform. The relation with YouTube that Green relates is both an acknowledgement of the concretization of the algorithms and an understanding of its limitations. Indeed, if the platform, by filtering the content, provides personalized content, it also obscures content.

As previously mentioned, the acknowledgment of platform values and cultures plays a role in deciding visibility and popularity. This is exemplified in Gary's vignette, where he gained fame on Instagram by aligning his posts with the content promoted by the platform. Consequently, popularity is attained not only by individuals who adhere to platform values and cultures in their publications but also by those who possess the ability to disseminate and influence others with these values.

Platforms such as Instagram or TikTok actively promote content that resonates with their predetermined values and cultural norms. Individuals who conform to these expectations and actively engage with the platform's content ecosystem are more likely to gain visibility and attract a larger audience. Indeed, the visibility granted to individuals on digital platforms plays a crucial role in shaping the content they can access and, consequently, their collective individuation.

Gary expresses that he was inspired to “escape from” the familial and cultural tradition thanks to the people he follows online on Instagram. Beyond his network, he mentions following several influencers. Abel on TikTok or Sahil on YouTube also follows people who advise on financial investments.

As Hyosun Kim (2022) explains, the term *influencers* defines ordinary people who have a great number of followers on social media platforms and who create and monetize their user-generated content on specific topics. By posting their mundane life activities, they generate a sense of authenticity and social presence. This confers to the audience a sense of proximity or belonging that they might not have otherwise. Gary's case models what his future life can be like in "realistic ways." For Abel, following stock market influencers provides the feeling of being both an insider in this financial world as well as being a potential money earner. Sahil, who is still hesitant about his future studies, finds, from watching videos of influencers, a potential future as well. For the individuals as for the influencers, this relationship is two-sided. In all cases, it extends their social network to people who would not be part of it otherwise. By showcasing a proximity with their followers, as well as an understanding of how algorithms work, and sharing their mundane life activities, influencers show what can be possible while increasing advertising effectiveness (Kim, 2022). Indeed, the interaction is strongly structured by the marketing goal of the influencers who most of the time manage to earn substantial money from their posts.

In the context of digital platforms, influencers and algorithms serve as sponsors of literacy (Brandt, 1998) by promoting certain content over others and influencing the access individuals have to specific information. While participants may perceive a sense of freedom by the ability to learn on digital platforms, it is automated sponsors (influencers and algorithms) who ultimately decide which content is made accessible and visible to users. They also "wield powerful incentives for compliance and loyalty" (Brandt, 1998, p. 167). These incentives create a dynamic where individuals may feel compelled to conform to the preferences and values set by sponsors to gain recognition, status, or other advantages within the platform ecosystem.

One of the key concerns associated with algorithms is not merely their existence or underlying values but rather their hidden and potent nature in shaping our daily interactions with technical systems. Through the automation and opacity of decision-making processes, algorithms perpetuate "epistemologies of ignorance" (Bhatt & Mackenzie, 2019).

5.4.4. Epistemologies of Ignorance

By enabling categorization and automated decision-making about what can be seen and what cannot, algorithms favor what Bhatt and MacKenzie (2019) define as epistemologies of ignorance. The point here is not to suggest that algorithms created these epistemologies of ignorance. As Linda Alcoff (2007) reminds us, according to where we are situated, geographically, socially, and culturally, we don't have access to the same knowledge and ignorance. This is obvious when Gary explains that his family circle, perceiving the stock market as gambling, barely knows how it works. One of the concerns regarding the algorithms on these platforms is their ability to automate decision-making processes about what information is prioritized, made visible, or hidden. This automation can lead to a decontextualization of ignorance that extends beyond the individual and collective situatedness.

However, as explained by Leander and Burriss (2020), with the introduction of personalization features, it is no longer possible to assume that several individuals would read the same content, as that content is now individualized and mutable. This constitutes a challenge in terms of collective individuation. Indeed, Gilbert Simondon (2005) explains that the transindividual, defined as the relation that goes from one individual to another, "does not localize individuals: it makes them coincide; It enables communication between individuals through meanings: it is the relationships of information that are paramount, not solidarity or functional differentiation relationships." (Simondon, 2005, p. 294; personal translation). In this context, the personalization driven by algorithms in each technical object leads to the individualization of available content. As a result, communication among individuals becomes increasingly challenging, as their shared experience with meaning is limited.

This hyper-individualization of content is also shaped by the values of the platforms with little consideration for those of the individual. For example, on TikTok, the perception of the temporality of content is designed to repress controversial or political content. As Collie and Wilson-Barnao (2020) reveal, some content has recently been censored from the TikTok platform including Tiananmen Square, Tibetan independence, and pro-LGBT (lesbian, gay, bisexual, transgender) content. Sophie Bishop (2018) explains that YouTube's algorithm also enables the hierarchization of vloggers favoring content aligned with advertisers' demands and desires, while other content remains

restricted. “Instead of promoting videos attracting the most views, often with sensational content, the algorithm now valued good visual and audio quality, a refrain from sexual topics and profanity, and videos easily matched with branded content” (p. 72).

These decision-making processes embedded in algorithms lead us to question what stories are shared, who or what created them, and which values are prioritized on these platforms (Noble, 2018). For example, Miles and Dave, during their interviews acknowledge that they learned about Western culture through different media both in the Philippines and in China, whether it was television or other applications they used. While this learning helped them to have a smooth integration into Canadian society, we may wonder what cultural values are ignored when they use “North American” digital applications to connect with their families or friends who are still in their country of origin. Miles and other participants from Filipino backgrounds indicate that Facebook is extensively utilized in the Philippines as a means of communicating amongst each other. However, in using this platform, they interact with an interface and algorithms specifically designed for North American individuals, which are embedded with certain values and consequently, oblivious to non-North American cultural values.

The power of digital platforms lies in their ability to encompass users who may not fit the mold of the “average user,” thus imposing their technological and normative frameworks on a diverse range of individuals. In doing so, these platforms often remain oblivious to the specificities of users in terms of their cultural backgrounds, communities, beliefs, and other unique characteristics. Furthermore, by personalizing content and advertisements, the platform places the individual, as a digital subject, into a category that they did not specifically request. Silas illustrates this when he says “I am pretty sure that Facebook knows not only who I am but they know my race, my sexual orientation, because I do see ads of that kind of apply to me” (Silas). Pangrazio and Sefton-Green (2022) explain that “processing data is dependent on the creation of categories and norms, which are often based upon particular social and cultural assumptions. These are assumptions with long, problematic histories” (p. 4). What is more, these data are often collected and processed without user consent. As John Cheney-Lippold (2017) reminds us:

When identity is formed without our conscious interaction with others, we are never free to develop— nor do we know how to develop. What an algorithmic gender signifies is something largely illegible to us, although it

remains increasingly efficacious for those who are using our data to market, surveil, or control us. (p. 8)

If retrieving this kind of data is part of the personalization of these platforms, this same data can be used as a factor of discrimination. As Phan and Wark (2021) assert, “Discrimination is not personalisation’s accidental product; it is its very condition of possibility” (p. 1). The authors argue that the crucial issue lies not in our understanding of race or sexual orientation per se, but rather in how this understanding is implemented in the technologies of personalization and how it is subsequently utilized.

In their examination of how Facebook conceptualizes and categorizes race, Phan and Wark (2021) elucidate that racial identity is reduced to a limited set of data points. This necessary reduction leads to a simplification and isolation of the concept of race within the platform's context. Similarly, the category of gender and sexual orientation undergoes a similar process of reduction and simplification within Facebook's framework.

Algorithmic categorizations are typically designed based on expectations of user behavior. However, when an individual deviates from these expected behaviors, it raises questions about how they are categorized and treated within the system. This aspect of categorization may not be a novel concept, but what is new is our limited awareness and understanding of the specific criteria and processes involved, as highlighted by John Cheney-Lippold (2017). This lack of transparency and knowledge about algorithmic categorizations disregards individual subjectivities and instead treats users as statistical objects.

The process of algorithmic categorization itself becomes an exercise of power, as it influences and determines the opportunities and experiences afforded to individuals. This concept can be likened to the notion of redlining, as discussed by Safiya Noble (2018). Redlining refers to discriminatory practices that historically restricted certain communities, particularly marginalized ones, from accessing resources or opportunities. In the context of algorithms, the demarcation of power occurs through the selection and prioritization of certain individuals or groups based on predefined categories, while overlooking the nuances and complexities of individual experiences.

The consequences of simplifications and categorizations within algorithms have significant implications for collective individuation. As Simondon (2007) posits, the process of individuation is intricately tied to their relationship with the collective, which includes their interaction with technical objects. Both the individual and the technical object play instrumental roles in shaping individuation, as they can facilitate or restrict tensions, knowledge acquisition, and ignorance. Drawing upon Michel Foucault's (1975) conception of power, we understand power as a capacity to act, influencing the dynamics between individuals, technical objects, and the collective. In this context, the decisions and mechanisms embedded within algorithms can exert power by influencing the possibilities and limitations of collective individuation.

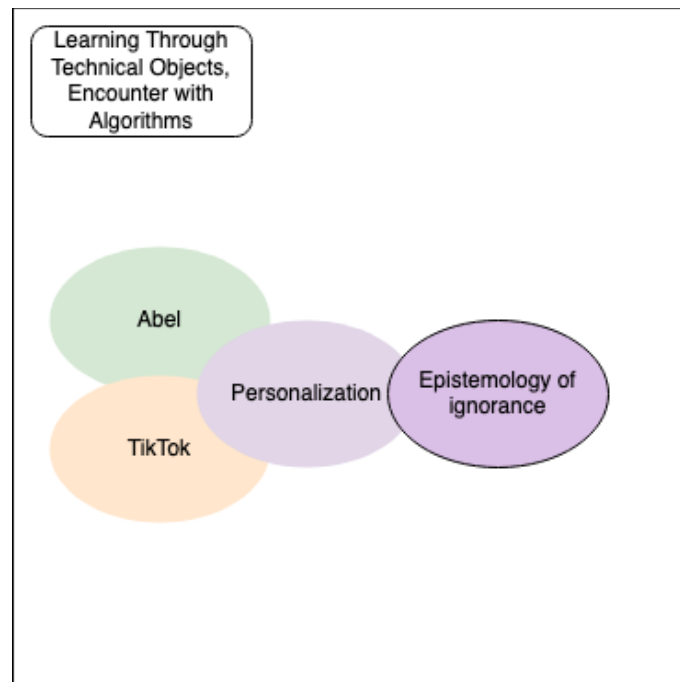


Figure 9: What emerges from these relations in Vignette 3.

5.5. Conclusion

These three vignettes allow us to better comprehend the relation between individual and technical objects. More precisely, they identify several processes in action which are characteristic of the digital devices and applications.

The vignette “First encounters with Technical Objects” retraces how participants remember starting their relationship with technical objects, usually during their childhood, regardless of the geographical location, whether in North America or other parts of the world. During these formative experiences, the design of these objects plays a pivotal role in shaping individuals' perceptions and experiences. However, it is important to note that the conceptualization of design is often guided by the creators' perception of the user, assuming a homogenous user base with shared sociogenic principles. In this process, the creators of technical objects tend to project their own understanding and assumptions onto the users, often overlooking the diversity of experiences, backgrounds, and stories that individuals may have. This homogenized view can lead to a limited perspective and a lack of consideration for the multitude of ways in which individuals engage with and relate to technology. In these conditions, individuals are compelled to adapt to the preconceived stories and assumptions set forth by the creators, inhibiting the recognition and validation of their own unique experiences and perspectives.

The vignette "The individuation of Gary and Concretization of Instagram" explores the interplay between the processes of individuation and concretization, highlighting how both individual and technical objects are engaged in an ongoing dynamic. This relationship gives rise to a new process known as datafication. Within this intertwining of individuation and concretization, datafication emerges as a significant aspect. Datafication refers to the transformation of various aspects of individuals' lives and activities into digital data. In the context of Instagram, the platform collects and analyzes user data, such as posts, likes, and interactions and generates what Goriunova (2019) names a digital subject. The digital subject represents the online persona or identity that is constructed through the amalgamation of user-generated content and shaped by the technical object's values. Through this process of datafication which is not exempt from values, Instagram transforms and aggregates individuals' actions and preferences into quantifiable data points, which are then used to shape and personalize the user experience. Consequently, the relation becomes tripartite among the technical object, the individual and the digital subject.

The third vignette, titled "Learning through Technical Objects: Encounters with Algorithms," delves into the influence of algorithmic processes on the accessibility of content through technical objects. These algorithms play a crucial role in shaping and

determining the content that is made available to individuals. They rely on the data collected and aggregated from the digital subject to personalize and tailor the content presented to individuals.

These three processes analyzed through these vignettes, design, datafication, and algorithmic processes, play a crucial role in the individuation of individuals. Indeed, these processes often prioritize the sociogenic principle of the creators of the technical objects rather than considering the diverse sociogenic principles of the individuals using them.

Furthermore, the increasing personalization and individualization of content displayed through technical objects, driven by the digital subject, pose challenges to collective individuation. As content becomes tailored to individual preferences and interests, there is a diminishing sense of shared perception and common experiences among individuals. The lack of a shared perception of content hinders the formation of collective knowledge and shared understandings that are essential for collective individuation.

Chapter 6 considers a second threshold in this inquiry. It goes beyond the surface-level examination of collective individuation and delves into the profound impact of the relationship between individuals and technical objects on the political and institutional dimensions of our societies. It recognizes that the intertwining of individuals and technical objects extends beyond personal experiences and extends into broader social, political, and institutional realms.

At this threshold, the focus shifts to understanding how technicity shapes and influences power dynamics, governance structures, and societal norms. The technicity embedded in technical objects, including algorithms, data collection, and decision-making processes, holds the potential to reinforce existing power structures or to challenge them.

Chapter 6. Threshold Two: Collective Individuation and Technicity

6.1. Introduction

Building upon the insights developed in the first threshold, the second threshold takes a deeper dive into the phenomena that intertwine individuals, collectives, and technical objects. It expands the scope of analysis to explore the complex interactions, dynamics, and implications of these relationships.

The first threshold focused primarily on understanding the experiences and influences of individuals in their encounters with technical objects. It highlighted three critical processes: design, datafication, and algorithmic processes, shedding light on their significance in shaping individual experiences. The second threshold broadens this perspective to incorporate the collective dimension, recognizing that individuals are not isolated entities but are embedded within larger social, cultural, and political contexts.

The first vignette, titled "The Political Dimensions of the Cyborg," draws upon Donna Haraway's (1986) concept of the cyborg to explore the complex relationships between individuals and technical objects. Haraway's notion of the cyborg challenges the traditional understandings of the boundaries between humans and machines, emphasizing their entanglement and mutual constitution.

Within this framework, the vignette examines the political implications that arise from the everyday and mundane uses of technical objects. It explores how these objects, which have become an integral part of our daily lives, are not neutral or apolitical entities. Instead, they carry and embody political ideologies, power structures, and social dynamics.

The second vignette, titled "Retrieving Collective Individuation Among Institutional Constraints," examines how individuals utilize technical objects to reclaim and foster a sense of collective individuation in the face of institutional constraints. This vignette complexifies our approach and the relationship between the individual, their collective individuation, and the technical object by following two participants in this research who manage to regain a bit of agency through the use of a website.

Overall, the second vignette expands the perspective and enriches the exploration of the relationship between individuals, their collective individuation, and the transformative role of technical objects in navigating institutional constraints.

6.2. The Political Dimensions of the Cyborg

In this section, with a particular focus on Kevin's vignette, we explore the political and geopolitical aspects of the relationships between humans and technical objects. Within the context of technical object providers, North America and China emerge as the two main players, each shaping the landscape in their own distinct ways. This analysis revolves around the central question of how seemingly mundane applications, despite their ordinary appearance, have the capacity to convey and shape specific geopolitical perceptions.

By examining Kevin's experiences and interactions with technical objects, we aim to uncover how everyday applications and platforms carry underlying geopolitical biases and narratives. This exploration sheds light on how these seemingly innocuous technologies can influence our understanding of the world and contribute to the construction of geopolitical imaginaries.

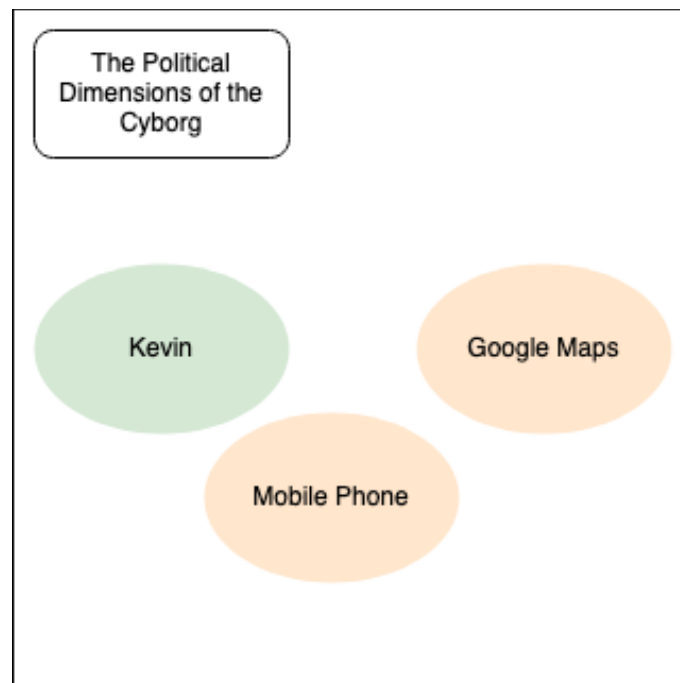


Figure 10: Participants of the vignette: Kevin and Google Maps

6.2.1. Vignette 4: Kevin and Google Maps

As with several participants, when talking about his relationship with the digital realm, Kevin, a 19-year-old, explains that he is very familiar with technical objects, and uses them constantly. The benefit he sees in using digital is to make “people’s life more convenient. Basically, you can look up everything on the Internet. If you want to know something, there is probably an answer on the internet” (Kevin). He further explains that apps, such as Google Maps which he uses daily, not only enable him to find the itinerary to reach his destination but also do it faster and more efficiently than not using the app, which he illustrates by way of an anecdote. Last summer he decided to take a road trip with his girlfriend to Banff, Alberta, which is a thousand kilometres east of where he lives, without the help of Google Maps. They bought a paper map and a compass and they had to navigate and make choices about which road to take. Even if they both enjoyed the experiment, it seems like they are not likely to do it again soon.

Kevin explains that using Google Maps is more convenient and more efficient than using a paper map. But he also recognizes that the price to pay is more often the supply of his data to these platforms:

I really just try to ignore it because you know there’s not a lot of things I can do because I still need to use these services because they are so convenient, [For example] I can just order something on Amazon, and I don’t have to go to the other side of the city to buy something. And the next day, the package will be delivered to me, so even if I know Amazon is seeing all my data, I still use it. (Kevin)

Like Kevin, participants in the study recognize and appreciate the numerous benefits associated with the use of digital technology. One of the primary advantages they highlight is the convenience it offers in various aspects of their lives. For instance, digital platforms allow them to access online courses, especially during the COVID-19 pandemic when traditional in-person learning has been disrupted. They also rely on digital tools to check the weather forecast, communicate with friends and family who live abroad, and perform other diverse daily tasks.

6.2.2. Mundane Applications for Everyday Problems

When asked about the apps installed on their devices, participants frequently mention popular social media platforms like YouTube, Spotify, and Instagram. They also highlight the presence of essential apps related to banking, weather updates, and email communication. These apps play a significant role in capturing a substantial portion of participants' everyday digital activities.

Of all the participants, Gary stands out with an impressive list of 46 apps. His extensive collection covers various aspects of daily life, including social interactions, weather updates, banking and investment management, online shopping, health and fitness tracking, food-related apps, and productivity tools.

As Kevin recognizes, technical objects allow participants to make their life easier such as using Google Maps to easily map their route during a trip. But “the electronic map” as he calls it, is not only significant as a change of platform, from paper to digital devices. It also implies a paradigm shift. As Morris and Murray (2018) recognize, most apps installed on our devices are built to solve everyday problems such as scheduling, waking up, and taking notes. But “the quotidian activities they influence and encompass are far from banal: connecting with friends (and strangers), sharing memories (and personally identifying information), making art (and trash), navigating spaces (and reshaping places in the process)” (p. 2). The daily use of these technical objects makes their processes barely noticeable, and as Sarah Pink et al. (2017) explains, “below the surface everyday routines, contingencies and accomplishments [...] both shape and emerge through our engagements with digital data” (p. 1).

In the case of Google Maps, scholars argue that it is not merely a representation of the pre-existing world, but rather it actively shapes our worldview (McQuire, 2019). Each map presents a unique perspective on how to exist and navigate the world, as it displays specific spatial distributions, borders, and place names. The creation of each map involves decisions about what to include and what to omit. Historically, these distinct perceptions of the world, often crafted by elites, were limited to specific time periods.

With Google Maps, the distinctive mode of being in the world is not only shaped by the concretization of the technical object but also by its technicity. According to

Simondon (1958), technicity refers to the interconnectedness and articulation of various realities, whether they are individual, social, cultural, or political in nature. Technicity is not limited to the technical object itself but exists as a transductive phenomenon that emerges at the intersection of diverse dimensions. Simondon emphasizes that technicity extends beyond the materiality of technical objects and encompasses a range of realities. Understanding technicity allows us to appreciate the interconnectedness of various realities and how technical objects both reflect and contribute to the broader social, cultural, and political contexts in which they operate.

Started in 2005 by Google with the acquisition of a digital mapping service, the company based the development of Google Maps on both the acquisition of different technologies and the opening of its Maps Application Programming Interface (API) to developers and the “Map maker editing software” to everyone willing to contribute to the project. The ability of public participation in the shaping of maps is quite innovative but it comes with several constraints in terms of moderation of the content for example.

Moreover, the participation of users does not result in shared property (McQuire, 2019). Indeed, Google maintains corporate control over what should be a common resource. This centralized governance of data raises important questions about the perception of the world that Google presents to its users. By controlling the data and algorithms that shape the maps, Google has the power to influence and shape users' understanding of the world, including the specific distribution of space, borders, and names.

Luque-Ayala and Neves Maia (2019) contend that Google Maps produces “a calculative spatiality that prioritises economic interactions” (p. 10). They explain that, in the case of the mapping of Rio de Janeiro's favelas, local knowledge is collected, edited by a combination of offshore ‘experts’ and proprietary algorithms, and then repackaged for both local and general consumption. Concretely, data are collected in the favelas by local communities. These data are then reviewed and moderated by a Google Team working abroad. For the authors, this amounts to “a spatial neo coloniality that aims to depoliticise space, translating the needs and means of the market but not necessarily those of local dwellers” (p. 9).

This political transformation in the perception of space and time can become even more ambiguous when borders are contested, such as between Israel and Palestine. In 2016, Valentina Carraro (2021) explained that, due to pressures from Zionist lobbies, Palestine disappeared from Google Maps. The challenge is even more pronounced regarding the status of Jerusalem, which is claimed by both countries. Carraro explains that “by presenting bits of data without context, Google passes a contested issue, i.e. that Jerusalem is in Israel, as an established fact.” (Carraro, 2021, p.69). Moreover, it appears that depending on the language you are using on the app, the displayed information changes. In Hebrew, as of June 2020, the text displayed in the sidebar states that Jerusalem is the capital of the State of Israel, while in Arabic, it was written that 'Jerusalem is the largest city in the occupied Palestinian territory' (p.71).

By choosing what appears on the screen, Google Maps contributes to the configuration of circulation, power, and territorial formation (Luque-Ayala & Neves Maia, 2019) or in the case of Israel and Palestine, territorial reformation. Through the map, stories of what belongs to whom are shared and are politically influenced.

While Google Maps develops functions for the user to be aware of car traffic and the opening and closings of stores and companies in real-time, this change in what is displayed on the screen according to the language of the technical object you use is politically and socially questionable in a context of international conflicts such as border disputes. As Scott McQuire (2019) argues: “Today, the authoritative maps that were traditionally produced and legitimated by state-aided agencies have ceded ground – both in terms of popular use but also in terms of cartographic ‘knowledge infrastructure’ – to maps made by commercial enterprises such as Google” (p. 159).

As a result, the transformation brought about by mundane activities enabled by technical objects and shaped by private companies extends beyond the specific activities themselves. It represents a broader paradigm shift that impacts various levels of the economy, society, and politics. The affordances and constraints of apps and digital platforms influence the way we engage with and perform everyday tasks, leading to changes in behaviour, interaction patterns, and even societal norms. Thus, the transformation of mundane activities on digital devices reflects a larger transformation in multiple dimensions of our lives and society as a whole.

Kevin is aware of this shift and of the fact that by using these applications, he is providing data that the platforms are looking for. He then faces the dilemma of choosing between the convenience of this app and his privacy. Of course, alternative applications exist and can be installed on digital devices, but this would require both the individual's awareness of alternatives and the willingness to give up some convenience. For example, Sahil, an 18-year-old, explains that he uses DuckDuckGo as a search engine instead of Google when he wants to do personal searches. At the same time, he thinks that Google's personalization in providing news is valuable as he feels he does not have to look for specific information.

Indeed, individuals often find themselves in a constant dilemma when using technical objects, particularly in terms of balancing privacy and convenience. This dilemma is transductive, as it involves the interplay and negotiation between different realities and considerations. The decision to provide personal data or prioritize privacy is not a straightforward choice but a complex and dynamic process influenced by multiple factors. Indeed, as Jill Rettberg (2020) powerfully details, the provision of data from the user is the first level of a complex datafication process. If we take the specific case of Google Maps, Kevin, like the local dwellers from the favelas (Luque-Ayala & Neves Maia, 2019), provides personal data that are shared with friends as well as nearby users. These data are then aggregated on the Google Maps app for anyone to be able to use. But these aggregated data are also available and useful for making decisions by individuals like Kevin as well as by other organizations. In this case, data are not only a representation of the world, but they also favour decision-making.

This aggregation of data and how it materializes on the Google Maps app amplifies the issue of how data are collected, categorized, and prioritized. As Barocas and Selbst (2016) explain:

If a sample includes a disproportionate representation of a particular class (more or less than its actual incidence in the overall population), the results of an analysis of that sample may skew in favor of or against the over- or underrepresented class. While the representativeness of the data is often simply assumed, this assumption is rarely justified and is "perhaps more often incorrect than correct." Data gathered for routine business purposes tend to lack the rigor of social scientific data collection. (p. 686)

6.2.3. Geopolitics of the Digital

As demonstrated with the example of Google Maps, technical objects are intrinsically shaped by the specific perception of the world infused by their creators. Additionally, the choice of one application over another can be significantly influenced by political and economic dynamics.

While most of the participants use Instagram and Facebook, they also use different applications available and ones which are popular in the country they immigrated from. For example, Kevin, Dave, Gloria, Amy or Ani who were born in China, use WeChat not only to communicate with their family abroad but also to access the news or other services. As Dave notices, WeChat is a very specific application looking nothing like the “Other World”:

This is a very interesting app because no Western society app in my opinion, that comes to my mind is the same as WeChat, because you can message other people like on Facebook Messenger. But on WeChat I spent a lot of time reading articles from subscriptions. So, the subscription articles are basically [about what] I’m interested in, and it can function like a news app, but also, an app that allows you to read about topics that interest you. (Dave)

Indeed, WeChat is designed specifically for people living in Mainland China. Its functionalities go from a messaging app to a payment platform. As Finn Brunton (Morris & Murray, 2018) reminds us, the WeChat application concretizes along Chinese society and politics. It started as a messaging app and, after many iterations, has become central to the everyday life of the population whether for gaming, booking a hotel room or reporting a traffic violation to the police.

The concretization of the app is specific as it remains loyal to its initial form of interaction, the messaging functionality. While the uses have evolved, the design of the interface remains the same. Instead of adding new affordances, WeChat is creating a category of “official accounts,” which are less a shift of functionality than a shift of context. People add them to their contacts knowing they are not people but businesses, organizations, and government agencies. Opening their channel enables various kinds of possible actions.

The implication of different governments in digital device governance varies according to each country. Using WeChat, Ani, who arrived in Canada from China in 2018, is aware that the Chinese government may still have access to her private communication but as she is a law-abiding citizen, she feels confident and has no concerns. She explains the difference:

[...] because in China, [...] Google is forbidden. So here [in Canada], I use Google. [...] I think I have more freedom. And I can do the research with more perspectives, more information I can choose which one I would believe. But before I couldn't [...] because in China, some information is forbidden. So, for example, you can search this word about anything and nothing will pop up because the place and the technology department, they block all the information about that word. (Ani)

The Chinese government is not the only one to filter the Internet access on their territory. People from Iran have Imo and WhatsApp. As Gisele, a 27-year-old Iranian tells me: “not telegram and not Facebook and maybe also YouTube. They are filtered.” She further explains that in 2019, there were protests in Iran and that consequently, people did not have access to the internet. If governments, such as those in China or Iran, restrict access to certain information or applications, companies like Google and Facebook often employ more subtle methods to achieve similar outcomes. As seen previously, this is the case for Google Maps. YouTube uses similar methods as Sophie Bishop (2018) explains. On the video-sharing platform, certain content, particularly those tagged with keywords like 'lesbian,' 'gay,' or 'LGBT,' is directed to be less visible or even hidden. In the same vein, Safiya Noble (2018) details how Google displays the results according to keywords. She reminds us that: “Google Search is an advertising company, not a reliable information company. At the very least, we must ask when we find these kinds of results, is this the best information? For whom?” (p.5).

While applications in the United States are developed by private companies, it is important to recognize that the relationships between these companies and governments extend beyond the mere requirement to comply with the laws of the host country. This collusion between private interests and politics became particularly evident in 2020 when the Trump administration attempted to ban TikTok from accessing the national territory of the United States. Joanne Gray (2021) offers a geopolitical analysis of the ensuing political and economic conflicts surrounding TikTok, which unfolded between the United States and China at the national level. Gray explains that while U.S.

private companies have traditionally dominated the digital platform market, the emergence of Chinese competitors like TikTok poses a significant threat to U.S. hegemony in this realm. She explains that “This dominance falls within a broader geopolitical system of US hegemony that has defined the liberal world order since the end of the Cold War” (p.2). Gray further explains:

In most sectors, market concentration is problematic but it is particularly so in an information economy. Digital platforms are information gatekeepers, with the capacity to influence social conditions by determining the ideas and information that are shared and amplified across vast socio-technical systems. (Gray, 2021, p. 2)

The complex interplay between economic, social, and political factors influences how individuals interact with digital devices and how they perceive politics. Moreover, the creation of technical objects, such as applications, is not just influenced by economic factors but also by the cultural and social milieu in which they are created.

It is noteworthy that despite the abundance of applications available on devices used by participants in this study, a significant majority of them originate from either the United States or China. Only a handful of applications, such as Spotify, have been developed outside of these two countries. This observation underscores the global dominance of the U.S. and China in the digital landscape and highlights how their cultural and political values may influence the development of digital applications.

As the digital world assumes the role of the primary source of information, the influence of these platforms on shaping our worldview becomes increasingly significant. Our knowledge and awareness are heavily influenced by the algorithms, content filtering, and curation employed by these platforms.

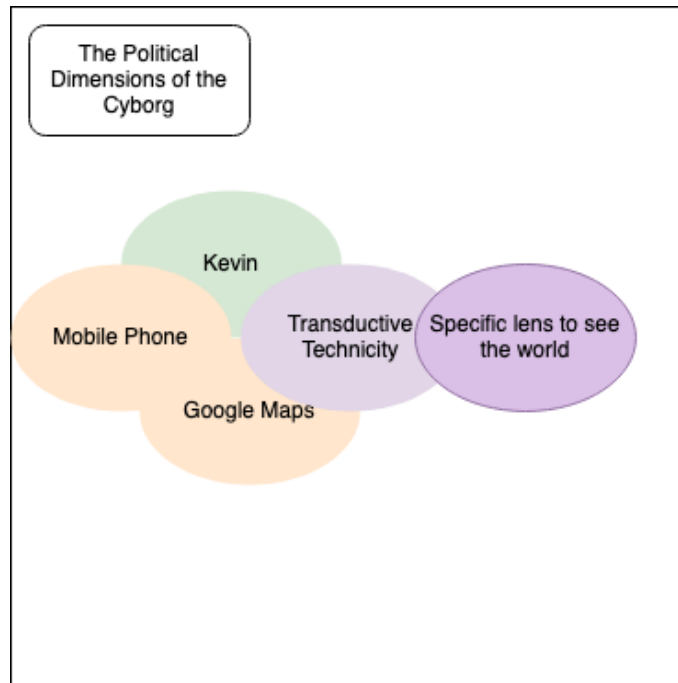


Figure 11: What emerges from these relations in Vignette 4

6.3. Retrieving Collective Individuation among Institutional Constraints

The final vignette of this study examines the connections between participants and various institutions they are affiliated with as students. These institutions play a role in shaping participants' experiences through the provision of different technical objects that evoke distinct affective responses. This vignette focuses on two participants, Yuki and Luke, and draws from my observations and discussions with them regarding the process of enrolling in post-secondary education.

The event happens in November 2021 at DownTown. While I am a volunteer in the program, both participants and organizers are aware that I am also a student as are many participants in this program. This “double hat”, as both volunteer and student, allowed me to connect easily with participants and find shared topics of conversation.

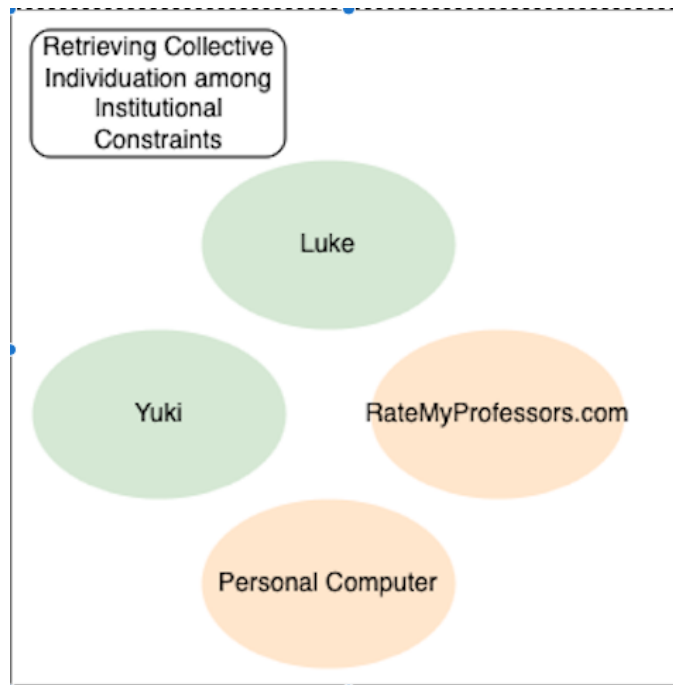


Figure 12: Participants of Vignette 5: Yuki, Luke and Ratemyprofessors.com

6.3.1. Vignette 5: Yuki, Luke and Ratemyprofessors.com

Yuki, a 20-year-old, is an undergraduate student in Psychology at a university in the Lower Mainland. To help his family, he also works a part-time job as a youth worker. Luke is a 27-year-old woman who recently arrived from China. She is a student in English at a college and aims to study Fine Arts at the same college, next year.

Having arrived earlier on this Saturday morning, I greet them and ask them how they are. Yuki tells me that he is enrolling in courses for the next semester but encounters some technical issues with the online platform. He explains to me that each time he clicks on a course, the platform sends a message error. When I ask him if he knows whom to contact for this kind of issue, he looks at me and answers: “not a Saturday and even at the university, they don’t know.”

I ask him about the registration process, and he explains that he needs to choose the courses he wants to register for and enroll in them. Luke, who joined us, agrees with him as she also needs to take courses. She is currently on the waiting list for several of

them. She further explains that when registration opens, there is a big rush to be the first one to reserve a seat. If you do not manage to secure a seat, you are then put on the waiting list. This system, she clarifies, leads students to develop strategies to secure a seat in as many courses as they can, and then to cancel their registration accordingly to suit their preferences. So, if you are on the waiting list, Luke continues, you may benefit from these cancellations, but only if you react quickly enough. Therefore, you need to be connected constantly, so as not to lose your potential seat.

When I ask them how they choose their courses, both Yuki and Luke list their criteria. As Yuki is working part-time, he is afraid that some courses would not fit his schedule. He tells me that he also chooses his courses according to the content of the course and how the syllabus is organized. Luke adds that she also picks the ones that are not online anymore because “online is quite boring sometimes” [sic]. “Oh yes, this is true, sometimes it is really hard to follow when it is online” agrees Yuki. Luke explains that she is taking Fine Arts courses, and that online course makes no sense as they have some hands-on activities. “Online is boring” she repeats.

Yuki and Luke both prefer in-person courses as they can ask questions more easily when they don’t understand. I ask why they don’t use the chat box online and Luke answers that sometimes, in class, you don’t ask the instructors, but the other students and that the online platform makes it harder to do so.

Yuki also adds that to make his choice on which course to take, he checks if the teaching style of the teacher is “ok” with his style of learning. Surprised, I ask how he could know that before taking the course. He explains that he goes on “ratemyprofessors.com” and reviews the comments left by other students about this specific teacher to know whether they are good professors or not. “I choose the ones with the best rate, at least 3.5 is ok.” Luke agrees. Yuki continues:

Once, one was rated 3.8 which is not bad and the comments said he was playful. But the other teacher was more chill, like no surprise, like he informs when there’s a test [...] I choose the one who is chill as I don’t like surprises. (Yuki)

The same Saturday, during a break, I see Luke opening her bag, taking out her laptop and opening it. I quickly come to sit down next to her and ask if I can watch what she is doing. She agrees and tells me that she is checking her registration process.

On the white screen, there is a table list of courses to which she has applied. In one column, there is the status of whether she is registered or not or on the waiting list. Out of seven courses, she is on the waiting list for five of them. When the status is “Waiting list”, there is a number beside it. She explains that this is the number of people before her. She has until mid-December to choose her classes and to make sure she has a seat. She then tells me that she is checking the page: “every day because I really want to attend these classes. It is really stressful because till the end, you don’t know. Sometimes there are issues in the registration process. So, you don’t know.”

One week later, I see Yuki and ask him if he has managed to register for all the courses he wanted. “Yes” he answers with a large smile, he managed it, but it costs him \$1400. He thinks this is too expensive.

At the beginning of December, Luke is still on the waiting list for two of her in-person Fine Arts courses. I ask her if she can apply to their online version. She tells me that she can, but she will have to pay for the material as it is a hands-on course. So, I ask her if it is less expensive to take the online course; she answers that it is the same price. In addition, she needs to pay for the course material. “This is why I want to be in person, online makes no sense for this course.”

There are numerous participants in this scene: Yuki, Luke, and myself, but also, among others, the institutional discourses of the university, the college, the registration interface, Luke’s computer, and the website “RateMyProfessors.com”. This excerpt shows how relations between human participants and technical objects such as institutional platforms or ratemyprofessors.com are productive on different levels, whether it is the psychic individuation, collective individuation but also at the governance level of the education institutions themselves.

The relationships, expressed by Yuki and Luke, materialize as tensions between them as individuals and the institutional platforms in terms of perceived glitches in the registration process, the existence of the waiting lists or the possibility of being in online courses. All these tensions generate affectivities such as stress, and frustration. However, Yuki and Luke have also found ways to navigate these challenges, such as using ratemyprofessors.com to assess the quality of the courses and checking the portal regularly to ensure Luke doesn’t miss any opportunities.

Indeed, as the platforms and their guidelines suggest, the registration for a course is not only dependent on the registration to an institution but also on the individual ability of students to access the platform. On the registration platform of the university, it is explained that:

If waitlisting for a class, students are responsible for checking their email every day to see if they have been offered a seat. It does not cost anything to be on a waitlist and it does not count as a registration. Once a seat becomes available in a section and you are at the top of the waitlist, you will receive an email to your email account and you will have 24 hours in which to accept your seat offer. Ensure that your device is set to Pacific Time as that is the time zone upon which the deadline is based. (<https://www.kpu.ca/registration/waitlisting> Accessed on June 25, 2023)

This explanation clearly puts the responsibility on the student, not only to register but also to have decent access to both their email and the university website. In these conditions, the student is positioned as the only one responsible for their success in the registration process.

6.3.2. Digitalized Registration Process as a Technicity

Referring to the digitalized registration process as a technical object, it is important to highlight that it is developed by a third-party external to the educational institution. This process necessitates both the students and the institution to adapt their practices and procedures to accommodate its use. This adaptation involves considerations related to material aspects such as ensuring accessibility to the internet, managing passwords, and other technical requirements. Additionally, there is a need for ongoing monitoring and adjustment of processes to align with the digitalized registration system, including keeping up with regular checks and implementing new policies as necessary.

When Yuki explains that he does not know whom to turn to for help with the technical glitches, he acknowledges that the registration process involves not only himself and the institution but also a third party that supplies the digital platform. The professional in charge of the registration process in the institution is not the same as the professional in charge of the technical registration process. In these conditions, modalities of selection to enter a university or a college are not only controlled by the institutions but also by the private companies which provide the digital platform. By

delivering this interface to the institution, this third party helps structuring, templating, and validating the registration process. In other words, they now have a role in deciding which data are important to collect, compile, categorize, and analyze. In so doing, we are touching upon what Ben Williamson (2016) names Digital Education Governance when he questions how technical aspects of what he calls the instruments (such as software, and algorithms...) and their social aspects including their representations of education, their values, combine in the enactment of specific techniques of governance.

In terms of technicity, which Gilbert Simondon (1958) defines as the mode of relation between humans and the world, the provision of these platforms by private companies to institutions highlights the interconnection between the realms of business and education. This intertwining raises critical questions regarding data ownership and control, prompting an examination of who holds authority over the collected and analyzed information. Moreover, this collaboration necessitates an exploration of the values embedded in these technical objects.

As Tom Lynch (2015) explains, since 1983, there has been a growing dominance of the perspective that sees the purpose of education as being inseparable from economic prosperity. This shift has led policymakers to increasingly embrace the private sector's viewpoint and involve them in educational matters, as evident in the current context.

In these conditions, Yuki and Luke try to carefully choose the courses they want to apply for. They base their choices on different criteria namely the availability of this course, if it is an in-person class, its summary, and the reputation of the instructors based on ratemyprofessors.com reviews. Surprisingly, neither Yuki nor Luke mentions the topic they are interested in as a criterion for choosing this course.

Both students are eager to secure a spot in an in-person course due to various reasons. Luke expresses her preference for in-person classes, stating that "online is boring." Additionally, since Luke is enrolled in a fine arts program, the courses often involve hands-on activities with materials that are only provided to students physically present in the classroom. As a result, both students have a strong motivation to attend the course in person. Yuki and Luke prefer to be in the same location as the instructors and the other students in case they have questions or comments. Despite the availability

of platforms provided by institutions for online courses, the two students still find it easier to engage in an in-person course. Although they have demonstrated familiarity with various technologies, including those that are integrated into their daily activities, they struggle to adapt to online video conferencing applications.

As is apparent in Yuki and Luke's conversation, the video-conferencing application is perceived as disruptive not only in the relationship between teachers and students but also in the interactions among students in the class. Indeed, as Sefton-Green and Pangrazio (2021) acknowledge,

[...] despite their cutting-edge appearance much educational technology is based around the traditional banking approach to learning and presumes an adversarial relationship between teacher and student, meaning students are surveilled, tracked and locked out of systems or otherwise rewarded for compliance and attainment through badges and certificates (Moro, 2020). (p. 6)

The adversarial relationship can manifest through the teacher's control over students' microphones, cameras, and chat box on online platforms. These technical capabilities, controlled by the teacher, impose constraints on both psychic and collective individuations of the participants. Simondon (2005) explains that both processes are typically triggered by tensions, and these tensions are resolved through relationships, whether they involve individuals or technical objects. However, in this case, the relationships with individuals are constrained by the system and/or the teacher, and the technical object does not allow any margin of indeterminacy for individual use to facilitate their individuation.

In *The Mode of Existence of Technical Objects*, Gilbert Simondon (1958) explains that the purpose of a technical object is often to address a tension or problem, and its concretization should enable a margin of indeterminacy. This margin allows for productive relations to occur, as we observed in the case of Abel and TikTok, where the platform was adjusted within the specific participant's environment. However, in the context of an adversarial relationship, neither Luke nor Yuki perceives the use of the technical object as an opportunity to alleviate the tension or explore the potential of this margin of indeterminacy.

Interestingly, to mitigate tensions arising from the registration process, Luke and Yuki mention another technical object: the website "Ratemyprofessors.com." This

platform allows students to access reviews and ratings of professors, providing them with an alternative source of information to navigate the course selection process. This demonstrates their active search for alternative means to address the challenges they encounter within the educational system.

6.3.3. RateMyProfessors.com as a Technical Object of Control

The last criterion that Yuki and Luke consider in the selection of courses is the review of the teachers provided by other students on the platform [ratemyprofessors.com](https://www.ratemyprofessors.com). More precisely, Yuki explains that the rating, over 3.5, and the teaching style of the professor are decisive in his selection process. He considers teaching style to encompass both the assessment of the professor and the perceived guarantee that there will be no surprise or unexpected challenge in completing the course.

RateMyProfessors.com is a website that describes itself as:

The largest online destination for professor ratings. Users have added more than 19 million ratings, 1.7 million professors and over 7,500 schools to Rate My Professors. User-generated content makes Rate My Professors the highest-trafficked site for quickly researching and rating professors, colleges and universities across the United States, Canada and the United Kingdom. More than 4 million college students each month are using Rate My Professors – join the fun! (<https://www.ratemyprofessors.com/About.jsp>, Accessed January, 3, 2022)

The platform allows college and university students to register, write feedback on the institutions and the courses they attend, and comment on the ability of the instructor according to different criteria: the perceived level of difficulty of the course, the rating of the instructor, and the credit allowed. The final criterion is whether the student would take this course again with the same instructor. Additionally, the reviewer can add three tags to the course instructor. This assessment is only made by students or users introducing themselves as students.

RateMyProfessors.com primarily targets college and university students as its average user base, although it also provides professors with the opportunity to create their own pages and respond to reviews. Students utilize this website as a tool to assess and predict the potential outcome of a course, specifically in terms of its level of ease or difficulty. By reading and considering reviews and ratings of professors on the platform,

students aim to gather insights and make informed decisions about their course selection based on their desired level of challenge or ease. As the website further explains:

Rate My Professors is built for college students. Choosing the best courses and professors is a rite of passage for every student, and connecting with peers on the site has become a key way for millions of students to navigate this process. The site does what students have been doing forever - checking in with each other – their friends, their brothers, their sisters, their classmates – to figure out who’s a great professor and who’s one you might want to avoid. (<https://www.ratemyprofessors.com/About.jsp> Accessed January, 3, 2022)

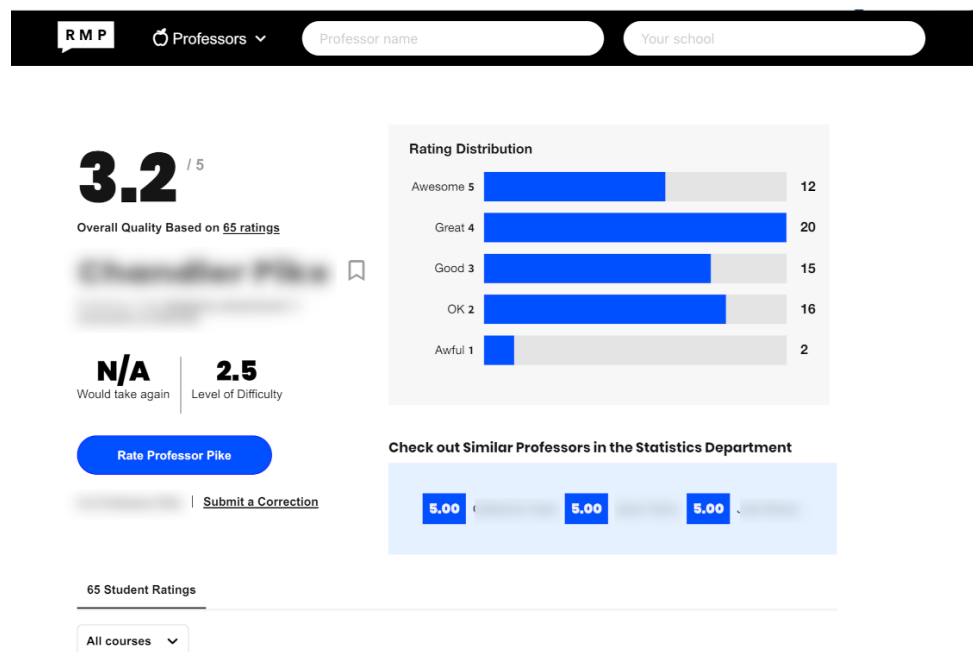


Figure 13: Rating of a teacher on RateMyProfessor.com

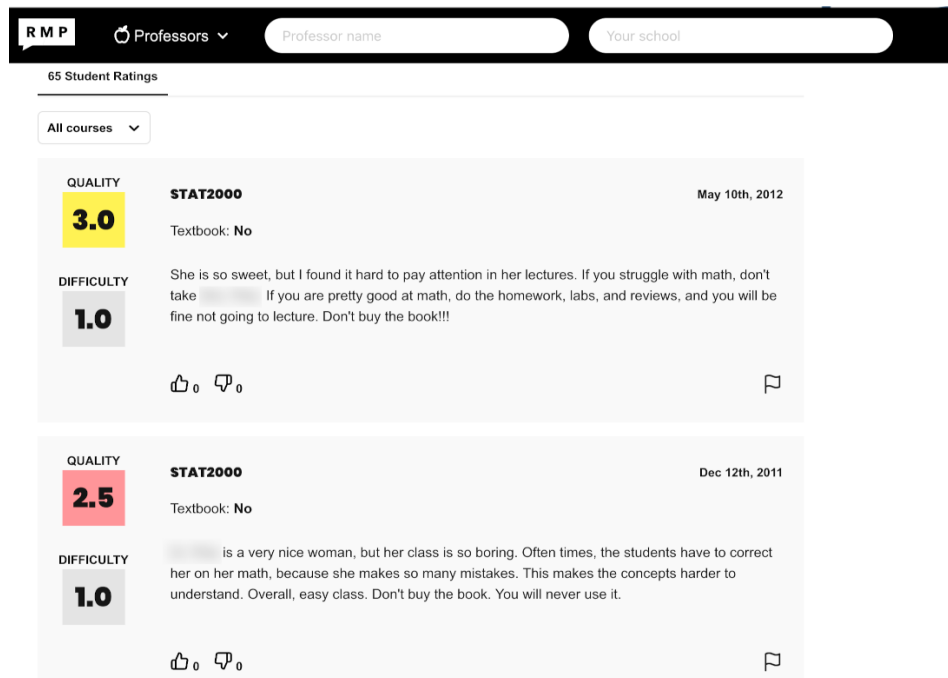


Figure 14: Comments about this teacher on RateMyProfessor.com

According to this analysis, Ratemyprofessors.com represents more than a mere continuation of traditional student practices in an online format. Instead, it signifies a paradigm shift, similar to what we observed earlier with Google Maps. Ratemyprofessors.com exemplifies a phenomenon that involves a reversal of expertise. As noted by David Savat (2010), the use of databases and the internet's enhanced visibility have a transformative effect on the role of experts and the status of knowledge. The website utilizes a database to present the "professor's ability" based on aggregated data contributed by users, primarily students. Consequently, the traditional expert, embodied by the professor, becomes increasingly subservient to the administrators of such systems, who assume the role of decision-makers without possessing the same level of expertise or knowledge necessary for evaluating the quality of a course. In this new landscape, expertise is derived from user-generated data, altering the dynamics of authority and knowledge evaluation.

It is indeed worth considering what students assess on Ratemyprofessors.com and how the platform itself operates. While the website explicitly requests users to focus on reviewing the course and their learning experience, excluding comments on “a

professor's appearance, dress, age, gender or race" (*Rate My Professors | Find and Rate Your Professor or School*, n.d.), it is important to recognize that such guidelines may not always be followed. Pamela Leong (2020) demonstrates that comments on this website reflect, even indirectly what can be potentially seen as discrimination. For example, the perceived ease of the course, which appears at the forefront of each evaluation can be related to the attractiveness of the professor, the language used, the absence or not of an accent, the tone of the voice, and the dynamism of the teacher. In her study, Pamela Leong also found that the race of the professor impacts the perception of the easiness of the course. She further explains:

Black faculty, a low external status group, were presumed by students in this study to be less capable than non-black faculty, indicated by the lower overall quality scores assigned to Black faculty, when compared to faculty of other racial groups. Racial stereotypes likely shaped students' expected teaching performance of Black faculty, thereby affecting students' evaluations of Black faculty. (Leong, 2020, p. 49)

6.3.4. RateMyProfessors.com as a Locus of Collective Individuation

Yuki and Luke rely on Ratemyprofessors.com to anticipate and exert some influence over their academic journey, particularly in selecting and succeeding in their desired courses. The website functions as an empowering tool for them within a selection and registration process where they frequently experience feelings of isolation and powerlessness. This is further compounded by the institution's expectation that they bear sole responsibility for their academic success.

To alleviate this tension, the website "Ratemyprofessors.com" can provide a sense of presence in the present and a feeling of "being together," which Gilbert Simondon refers to as a collective. Simondon (2007) explains that a collective is not defined solely by sociological membership but rather emerges through processes of individuation. In this context, the temporary collective formed on Ratemyprofessors.com arises as a momentary solution to the incompatibility between existing institutional structures (which involve power relationships and the requirement for students to choose courses and instructors for their degrees or diplomas) and the potentialities that individuating individuals possess or share among themselves.

This collective formation allows students to navigate the complexities of course selection and find guidance in Yuki and Luke’s pursuit of academic success. It acts as a bridging mechanism between the existing institutional structures and the individual potentials, providing a space where students can gather, share knowledge, and support each other in their academic journeys.

Furthermore, the website and the collective sense it creates provide an opportunity for Luke to modulate her affectivity, as she expresses being stressed regarding this process, into emotions. As explained by Simondon (2007), the transformation of affectivity into emotion enables individuals to actively participate in collective individuation.

As observed previously, not all technical objects enable collective individuation the same way, as seen in the case of TikTok’s personalization which does not allow the presence of other individuals in the present. Similarly, certain objects and systems used in post-secondary institutions, such as the registration process or video-conferencing systems, may not foster or facilitate collective individuation, as they fail to enable the transformation of affectivity into emotions. Consequently, these objects and systems may not directly address or resolve the tensions experienced by students.

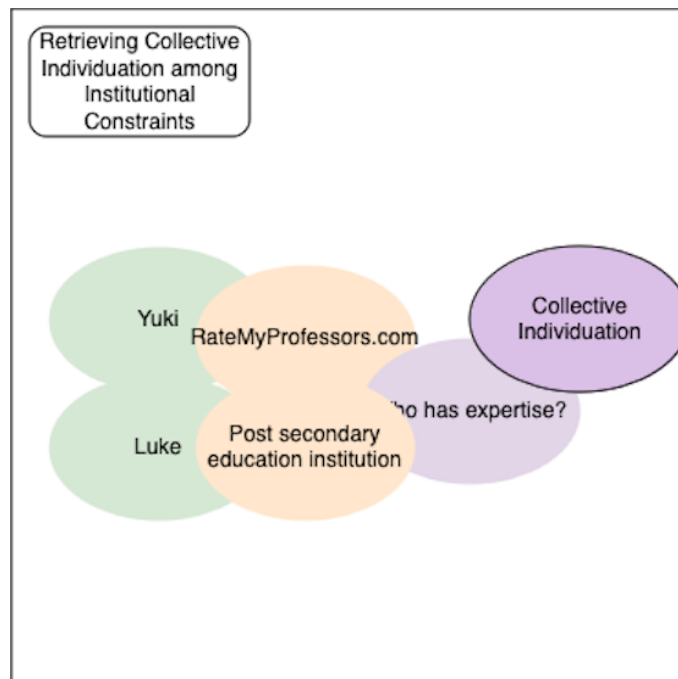


Figure 15: What emerges from these relations in Vignette 5

6.4. Conclusion

The dynamics illustrated in these various vignettes are multifaceted. Participants are entangled in and productive of a shared social, cultural, economic, and political dynamic. These agencements encompass diverse elements, including humans, digital subjects, affectivities, processes of individuation, material devices, technical objects such as data or algorithms, and traditional institutions like governments, schools, and private companies from both North America and China.

"The political dimension of the cyborg" describes what Donna Haraway (1985) defines as a "cyborg" acknowledging both the porous boundaries of humans and more-than-humans and the vital necessity of digital in human life. All the participants acknowledge the ubiquity of technical objects in their life, reshaping mundane activities, such as searching for the optimal travel route. However, these transformations are not devoid of influence and are shaped by narratives and values that align with governmental or corporate interests. Furthermore, the vignette underscores the persistent polarization of the digital realm between China and the United States, which are the primary sources of the majority of digital applications.

"Retrieving collective individuation among institutional constraints" centres on the tripartite relationship between individuals, technical objects, and institutions. This vignette explores the interaction between Yuki, Luke, and a post-secondary education institution, where the acquisition of digital skills becomes imperative during the registration process. Despite the institutional requirements, the participants navigate and discover a sense of collective individuation, agency, and empowerment through a website. Contrasting with the vignette "Learning through technical objects: encounter with algorithms", this particular vignette challenges and deepens our understanding of the relationship between technical objects and the process of collective individuation.

Each vignette provides a glimpse into narratives where technical objects and individuals, and collectives are intertwined within power dynamics, ultimately shaping the very technicity of the society in which we live. These vignettes highlight the significant influence of technology on our lives, illustrating the need for renewed digital literacy frameworks that closely examine these social, cultural, political entanglements.

Engaging with these thresholds and vignettes enables a nuanced approach in this research. As Jackson and Mazzei (2013) point out, thresholds serve as both entry points and exits for various elements such as data and theories in our research. It offers a diffractive approach to what emerges from the encounters between individuals and technical objects, revealing sometimes diverse outcomes. This plurality of outcomes must not be seen as contradiction but rather as the importance of the agencements in which these relationships unfold.

Furthermore, these thresholds encourage us to reconsider not only the relationship between technical objects and individuals, but to consider both individuals and technical objects. As Deleuze and Guattari (1987) emphasize, through relational dynamics, both individuals and technical objects becomes.

The subsequent chapter will provide a more comprehensive exploration of these findings, delving deeper into the dynamic nature of individuals and technical objects in their processes of becoming. It will also examine the social, cultural, and political dimensions that shape and are shaped by these relationships. The aim is to reflect upon these complexities and use them as a basis for informing the development of a comprehensive digital literacy framework.

Chapter 7. Returning to Digital Literacy Frameworks

7.1. Introduction

In this chapter, insights from the two thresholds will be considered through the lens of the over-arching question this thesis addresses: What are the relationships between individuals and digital devices or applications? How can we approach digital literacies to consider both individuals and digital technologies in their multiple dimensions?

In the first section, the implications of these thresholds as a whole will be outlined in relation to the understandings derived from the conceptual framework outlined in chapters 2 and 3.

Indeed, these thresholds reveal that every participant, whether an individual or a technical object, is intricately woven into a complex network of social, cultural, economic, and political dynamics. In these multifaceted and interconnected domains, it becomes imperative to comprehend the positioning and definition of these individuals before delving into the potential impact of digital literacy practices and pedagogical frameworks.

Each vignette recognizes the significance of power dynamics, which exert a fundamental influence on shaping the stories and collective individuation of the participants. These power dynamics, as described by Simondon (1958), also impact what he refers to as "technicity." Therefore, it is crucial to identify the multiple agencies that are intertwined within these power dynamics and technicity. This identification allows for the exploration of diverse approaches to instigating changes in these dynamics. The first part of the discussion, "Defining Digital Objects, Individuals, Technicity Through Relations", relies on the five vignettes, locating different agencies and exploring their interconnections with broader social, cultural, and political systems. By doing so, I hope to demonstrate how power structures shape participants' positioning and perspectives in relation to technical objects. The second section of this chapter, "Toward a Diffractive and Speculative Approach to Digital Literacies" delves deeper into the potential levers of change that can be harnessed to transform these power dynamics and promote more equitable and inclusive digital literacy practices.

7.2. Defining Digital Objects, Individuals, Technicity Through Relations

7.2.1. How are Technical Objects Defined in These Relations?

Through the five vignettes, different aspects of applications or digital devices as technical objects have been considered: how the design of the technical object is directed toward 'the average user,' and its discriminating effect on those who fall outside of that category; how data generated through the relationship between technical objects and individuals are aggregated; the algorithms enabling and constraining the individual in the use of the technical objects.

Design, Datafication, Algorithms as Processes of the Digital Object

This thesis argues that processes of Design, Datafication, and Algorithmic processes, specific to the digital realm, must be accounted for in any reshaping of digital literacy frameworks. While digital literacy is often perceived as the capacity to read and critically engage with digital texts, an awareness of these diverse processes allows for a more nuanced understanding of digital literacy.

Design, as examined in the vignette featuring Dave and Miles, involves the conception of objects that hold significance for the individuals whom the creators identify as "users." This process encompasses various aspects, including the shape of the technical object, its icons, and the display of text or media that are perceptible. Design processes are inherently relational, relying on the effectiveness of receiving and providing feedback.

Datafication refers to the process of converting human characteristics into computable and frequently quantifiable information. Sefton-Green and Pangrazio (2021) define it as the translation of social and institutional interactions into a digital code that enables real-time tracking and predictive analytics. As exemplified in Gary's individuation and the concretization of Instagram, the process of datafication initiates through the interaction between individuals and technical objects. Similarly, in Kevin's encounter with Google Maps, data undergoes multiple transformations after its collection, often involving aggregation with other data sets. The collection of data often occurs from

diverse sources and may undergo substantial modifications before it becomes valuable for analysis or other purposes.

The third feature, algorithms, as defined by Tarleton Gillespie (2014), is a process encompassing three main steps: collection; categorization, also called discrimination by Louise Amoore (2020), and anticipation. As David Beer (2017) contends, algorithms are always produced from a social context and are woven into practices and outcomes. The main goal of algorithms is to solve a problem that their creators identified. However, as exemplified by Abel and his use of TikTok, individuals are not necessarily confined to using the technical object solely for its primary goal.

These processes also generate representations of the individual, whether it is through the concept of the "average user" or the emergence of the "digital subject" (Goriunova, 2019). Following these findings, if the technical object as defined by Gilbert Simondon (1958) remains useful to inscribe the vitality and the values of the object in its mode of existence and its process of concretization, it is possible to complete this approach with three other characteristics to define what could be named as the digital object. These three features, the design, algorithms and datafication, are intertwined and interdependent processes that mutually shape and influence each other. They all should be considered as entangled and relational processes as they are productive of each other. Henceforth, this dissertation employs the term "digital object" to specifically refer to any technical object that encompasses these three fundamental processes of design, datafication, and algorithms.

The Digital Object as a Geopolitical Object

As highlighted by D'Ignazio and Klein (2020), the development of what can be referred to as a digital object is a privilege held by only a few institutions. These entities possess the power and resources to harness the various processes embedded within digital devices or applications for their own benefits. In their analysis, the scholars identify three main actors that have the capacity and motivation to invest in this realm: large universities, governments, and corporations.

Furthermore, the fourth vignette provides a vivid illustration of a prominent trend in the digital landscape, namely the concentration of digital objects originating from California, U.S.A., and China. This trend extends beyond technical considerations and

reflects the intricate interplay of social, political, and ideological dynamics that shape the digital world. The dominance of digital content emanating from these two regions is a manifestation of the prevailing cultural narratives, values, and power structures that influence the global digital ecosystem.

As seen in the second vignette, this concentration and polarization of digital content have significant implications for the diversity of digital storytelling and the representation of various perspectives within the digital sphere. As digital technologies increasingly shape our modes of communication, information access, and engagement with the world, it becomes crucial to acknowledge and address this imbalance.

7.2.2. How are Individuals Defined in These Relations?

This section examines the impact of power dynamics and technicity on individual positioning, stories, collective individuation, and agency. Such analysis is essential for identifying potential avenues for change.

The vignettes shed light on the diverse positions held by young individuals within these agencements and how agency emerges from the intricate relationships described. The following analysis focuses on two key aspects: the sociogenic principles that are acknowledged and the potential for collective individuation within these agencements.

The Unheard Stories

Across all the vignettes, questions surrounding power dynamics and agency are of the utmost significance. The use of digital objects allows individuals to gain insights into the various stories that shape economic, social, cultural, and political domains. However, participants in these narratives often have limited influence over the creation and shaping of these stories. Whether it is Miles, Dave, Kevin, Yuki, or Luke, participants find themselves positioned by both digital objects and institutions as recipients of these narratives that, nevertheless, have a profound impact on their everyday lives.

However, this positioning does not mean that they are passive and uncritical of these stories. The interviews and observations highlight their awareness of the dominant stories pervading even mundane activities. They even display some tactics such as

limiting the amount of time spent on digital objects, tweaking privacy settings or using alternative solutions to several apps.

The positioning of individuals as recipients or users is not limited to personal interactions with digital objects, but also extends to encounters with institutions such as post-secondary school registration processes, as experienced by Yuki and Luke. In such situations, young individuals are often positioned as users, relying on digital objects such as websites or applications to retrieve a sense of power and agency. These tools serve as a means of support and training, enabling them to navigate complex systems and processes with greater ease.

Regardless of their personal stories or backgrounds, the use of digital objects of their choosing plays a critical role in giving a sense of power to these individuals and enabling them to make sense of their experiences as is the case for Gary in vignette two.

In many cases, whether it is digital objects or institutions, the multiple stories and individuations of participants are often overlooked or ignored. This failure to recognize the unique perspectives and experiences of individuation can lead to a homogenization of individuals and a disregard for their differences-in-themselves. In so doing, digital objects and institutions impose their own story while often being oblivious to other stories circulating.

The (often) Unheard Collective Individuation

This homogenization of individuals by digital objects, as seen above, plays an ambiguous role in their collective individuation between what digital objects are enabled to do and how individuals are represented through these relationships. In Amy's case, the role of digital objects in her social network relation is even more critical during the pandemic. Indeed, during the health crisis, schools, work settings, social relationships relied heavily on the ability of digital objects to maintain relations. Also, Abel and Gary use social media platforms to increase and diversify the size of their social network by following friends but also influencers. In these conditions, it would be easy to believe that using digital objects in maintaining or expanding social relationships favours the development of collective individuation. Simondon (2005) conceives the individuation as both psychic and collective in a relation always changing and productive.

The point here is that this conception of relation as productive, always changing and sometimes unpredictable is barely considered in the design, datafication and algorithmic processes of digital objects. Indeed, as Yuk Hui (2011) explains, social media platforms are based on a model of relation as linking two nodes whose evolutions and potential changes are not considered. On social media platforms, the node is the user or more precisely what Olga Goriunova (2019) calls the digital subject. In Gary's vignette for example, the digital subject is created from his interaction with Instagram and evolves according to the aggregating data.

Here, a disjunction is at play with the individuating individual. While Gary pursues his individuation in a metastable milieu, Instagram displays existing and linear relations between stable nodes. Indeed, even if data aggregates, they are the accumulation of past actions that do not allow for uncertainty because the data collected are chosen by the creators and processed to fit into categories. In other words, data do not become but aggregate. Envisioning the individual as a social atom implies as Yuk Hui (2011) explains, an extreme form of individualism:

When the users are considered as social atoms which can then be superimposed onto a technological network, the spontaneity and innovation within the collective is given to control of the networks, which is mainly driven by intensive marketing and consumerism aimed at individuals.

Being positioned as a non-evolving node impacts the collective individuation of users of social media platforms. Indeed, the algorithmic processes do not only decide what or who to display, what or who to make visible, they also define, and sometimes statistically stabilize, the digital subject with the aggregation of data of their choosing in which the individual has little say. As digital objects are now ubiquitous even in mundane activities, as the vignettes showed, they heavily shape the collective individuation of users.

It is even more pivotal that the "young user" category appears to be most often an afterthought of the designers and developers of these apps. As Lenhart and Owens (2021) describe, this type of user, defined only by age, is only mobilised when a dramatic event involving a young person is mediatized or when private companies communicate about the security of their applications. Similarly, young participants who recall receiving information about digital devices often mention classes, workshops, or

conversations with their caregivers, which focus primarily on online safety. In these circumstances, whether it is in John Horgan's discourse or in the discourse of private companies, young people appear to be either a category of users to be protected or a category to be protected from, and at times, they are simply hidden.

As several vignettes underline, relations between digital objects, participants and institutions are complex and multi-scaled. These relations play diverse role in the type of collective individuations they are becoming. For example, in the vignette in which Abel learns about financial skills, TikTok's algorithms curate and display selected videos and information based on Abel's interactions, such as likes or followed accounts. In this intricate web of power relations, knowledge assumes multiple roles, as explained by Michel Foucault's theory (1979). However, it is important to recognize that this relationship is far from being symmetrical, despite Abel gaining knowledge in his area of interest. The flow of content is not controlled by him, but rather by unfamiliar algorithms meticulously designed and shaped by specific narratives, utilizing undisclosed data and reflecting the values of the company ByteDance. Consequently, the content that Abel encounters may not necessarily align with his interests or values; it is instead a product of intricate and often opaque algorithms that prioritize certain types of content over others.

In the meantime, in Yuki and Luke's vignette, using a website such as "RateMyProfessor.com", which is also controlled by unknown algorithms retrieving unknown data, can be seen by some students as recovering a bit of power when they need to enroll in courses at their post-secondary institutions. In this case, the power here is not only coupled with knowledge but with visibility, by determining which comments are visible on the screen are more prevalent than the topics taught in these courses for example. This visibility is always constrained and enabled by the values and objectives of digital objects (Bishop, 2019; Noble, 2018). These types of technologies, such as review sites, pave the way for what Gilles Deleuze (1992) refers to as technologies of control. In this case, the focus shifts from the post-secondary institution itself to the individuals involved, namely the instructors of these courses, who are subjected to evaluations by the students. The ability of laypersons to publicly comment, without necessarily possessing expertise in assessing the quality of the course, raises concerns. These evaluations of teachers' abilities could potentially be used as a basis for decision-making. Consequently, knowledge and expertise are undermined in these

circumstances, replaced by what Darmody and Zwick (2020) term 'hyper-relevance'—a concept borrowed from the vocabulary of digital marketers. According to this concept, content provided on the internet should prioritize being meaningful and personalized to the consumer, rather than being strictly accurate. This hyper-relevance undermines the traditional notion of expertise and reshapes the perception of which forms of knowledges hold importance.

7.2.3. Defining Technicity

In these circumstances and illustrated by these vignettes, it would be risky to definitively establish the roles and powers associated with digital objects, as well as the capabilities and limitations they offer. Additionally, positioning oneself as a user in both situations, whether with social media platforms or within institutional contexts, symbolizes the technicity of the society in which we reside.

Gilbert Simondon (1958) defines technicity as the mode of relation between humans and the world. In this conception, each object “functions to interlace social, political, economic, and cultural dimensions. As such, technicity is crucial for a rigorous understanding of the possibilities of collective life – the political task par excellence” (Coté & Pybus, 2016, pp. 86–87).

Technicity spreads transductively at the intersection of different realities as is visible through the different vignettes, whether it be corporeal with the cyborg (Haraway, 1985), social with the renewal of the collective individuation, cultural, political, and geopolitical. This transductive technicity unveils new dynamics of power as seen in the collusion of private companies and governments and is productive of new ones such as what Gilles Deleuze (1992) calls societies of control.

To develop the concept of the society of control, Deleuze draws upon Michel Foucault's work in *Discipline and Punish* (1975). This essay acknowledges the transformation of power in society, transitioning from its visible and overt manifestations to its invisibility and pervasiveness in our minds and bodies. Foucault defines discipline as a mode of power that allows a rigorous control of bodies.

(...) a 'mechanics of power' was being born; it defined how one may have a hold over others' bodies, not only so that they may do what one wishes,

but so that they may operate as one wishes, with the techniques, the speed and the efficiency that one determines. (Foucault, 1975, p. 323)

The main function of discipline is to produce what society determines as “useful” individuals. In his brief essay, *Postscript on the Societies of Control* (1992), Gilles Deleuze explains that we are transitioning away from societies of discipline and toward societies of control. These new societal forms are no longer solely focused on producing useful individuals; instead, individuals have become "dividuals" and are treated as samples, data, markets, and banks (Deleuze, 1992, p. 5). In other words, the society of control places greater importance on individuals' data than on the individuals themselves (Smythe, 2018). Indeed, this society of control is not only encompassed in digital objects but also in laws and policies, economic, cultural, educational and social domains. Mbembe (2021) goes further explaining that:

More and more, statistical thought, regimes of assessment of the natural world, modes of prediction, and analysis treat matter and life itself as finite and computable objects. The idea that life might be an open, nonlinear, and exponentially chaotic system is increasingly behind us. (p. 18)

Consequently, technicity carries a normative aspect, which is clear in the presented vignettes. Both digital objects and institutions tend to overlook the processes of individuation that participants are currently undergoing. Whether it is through design, data retrieval, or algorithms, participants find themselves constrained by the expectations imposed by these digital objects or institutions. Additionally, distinguishing between private companies and public institutions becomes increasingly challenging, particularly in areas such as the school registration process. The collaboration between private and public sectors in these domains is not a novel occurrence. Williamson and Eynon (2020) remind us that:

AI in education is not just a pursuit of educational data scientists and learning science specialists. It is also a major commercial concern of educational technology (edtech) companies, which have sought to bring multiple forms of AI-based products to market, and of powerful philanthropic and investment actors that support Aled startups as part of the development of adaptive personalized learning software enacted by machine learning (Selwyn 2019). (p. 226)

Nonetheless, if these transductive technicities shape participants' individuation, indeterminacies, and unpredictabilities embedded in metastability, they also enable us to

not be deterministic and to retrieve some power, some margins of agency. Indeed, as Mbembe (2021) explains:

Power, detection, and surveillance are nevertheless not all. Algorithms are interwoven with a multiplicity of relations and heterogeneous things, be they data, bodies, or objects (Amoore 2020). In this sense, they are in themselves a negotiated process. Their power derives from their capacity to dynamically combine and recombine them and in so doing to reconfigure different social and material heterogeneities (Burke 2019; Lee and Björklund Larsen 2017). How they fold and unfold these relations, and with what effects, is an open-ended matter. (pp. 18-19)

When a domain undergoes transduction, it takes on a particular structure, but this structure is always a partial and incomplete solution to a relational problem (Mackenzie, 2003). In other words, as Simondon's philosophy emphasizes, everything exists within a temporary, metastable, and relational system. As Kitchin and Dodge (2011) explain regarding space: "The nature and transduction of code/space is never fixed, shifting with place, time, and context (social, political, and economic relations and situations). Code/spaces are relational, emergent, and peopled" (p.75).

In these conditions and acknowledging this transductive technicity, it becomes critical to locate how agency is distributed.

Locating Agencies

Whether it is through Gilbert Simondon's perception of individuation or his understanding of the mode of existence of technical objects, the core catalyst for the processes he describes always exists within the realms of indeterminacy and unpredictability for both humans and more-than-humans. Simondon (1958) asserts that it is precisely within these margins of indeterminacy that technical objects become actualized, while humans assume the role of conductors between different machines. While this perspective recognizes the relationships between humans and digital objects, it positions the human at the focal point of these relationships. Therefore, we must return to Karen Barad's concept of agency introduced at the outset of this dissertation and explore how these relationships can be articulated in digital literacy frameworks and pedagogies. For Karen Barad (2006), agency does not only belong to humans and should not be considered as a binary proposition, whether entities have agency or not.

Agency is the space of possibilities opened up by the indeterminacies entailed in exclusions. And agency, in this account, is a much larger space of possibilities than that generally considered. The reworking of exclusions entails possibilities for (discontinuous) changes in the topology of the world's becoming. But not everything is possible at every moment. Interior and exterior, past, present, and future, are iteratively enfolded and reworked, but never eliminated (and never fixed). (p. 182)

This perspective allows for the repositioning of human participants as components within agencements, without necessarily placing them at the centre. It becomes apparent, through various vignettes, that agency must be reconceptualized as a relational phenomenon rather than solely a human characteristic. It encompasses the entangled techno-human agency that emerges from these interactions. For instance, in the scenario where Kevin navigates from point A to point B, Google Maps actively shapes the possibilities of this trajectory by suggesting what it deems the "best" route through automated decision-making. Kevin, Google Maps, as well as other entities such as the car and the roads, all contribute to making this movement possible. In this case, these agencies are not in opposition to one another; rather, they collectively enable something new to emerge.

Agencies can sometimes conflict, as demonstrated when Luke and Yuki attempt to enroll in their courses. The constraints they face are not directly imposed by individuals but by the registration portal, which dictates their eligibility for desired courses. In these circumstances, Yuki and Luke's agency is limited by the technical operator. Confronted with a situation where they feel they have little control, participants conveyed a sense of isolation as they were obligated to follow a process dictated by both the educational institution and the technical operator. Yuki and Luke recognize that, in this specific scenario, the educational institution does not appear to exert agency either. When asked who could assist them with technical issues, Yuki responded, "Not on a Saturday, and even at the university, they don't know." In light of these circumstances, it is essential to map the flows of agency and power within any context involving digital literacy practices. These flows play a significant role in determining what is possible and what is not, or, as Karen Barad would put it, they shape the possibilities for change. Moreover, recognizing that human participants are not the sole bearers of agency necessitates a digital literacy framework that considers the location and positioning of humans within relational systems of power. Developing strategies to

account for and map the circulation of power within these systems becomes an important aspect of digital literacy.

Locating the Importance of Digital Literacies in Technicity

Technicity encourages us to reconsider digital literacies not as the individual's ability to navigate the digital world, but to recognize the permeability and transductivity across various domains of practice and research. Several scholars have already recognized the necessity of adopting a holistic approach to digital literacies and education. Garcia and de Roock (2021) advocate for an approach that integrates media, civic, and literacy education. They argue that:

when we consider how individuals interact, communicate, and exert power across digital and analog spaces, civic action is inextricably fused to the literacy acts that support it. Historically, the threads that weave civics to literacies have been present for a long time; literacy is inextricably linked to centralized modes of domination but also liberation. (p. 189)

These authors also acknowledge that literacy research has encountered difficulties in evolving as a theory that challenges, opposes, and redefines the possibilities for civic life in the era of participation. Consequently, when integrated with civic education, digital literacies can provide pathways for resistance.

Emejulu and McGregor (2019) observe that the role of politics in shaping social and cultural relations has often been neglected in digital education. They advocate for a concept they refer to as radical digital education, which aims to emphasize the interconnectedness of politics and the digital realm.

Analyzing datafication, Pangrazio and Sefton-Green (2022) explain that:

In general terms, educational responses posit the idea that people should have knowledge about the way that datafication works. However, the actual mechanisms by which that knowledge might be acquired, what it might consist of, and how the possession of it would affect a whole range of behaviours, is often vague (p. 6).

Consequently, these educational responses are often distilled in the term "literacy" describing an individual's capacity to understand information and to demonstrate knowledge through their practices. But beyond developing these skills, the authors call for a critical reflection on how datafication is changing the way we live, learn and work (Sefton-Green & Pangrazio, 2021). Indeed, reflecting on the impact of the process of

datafication including their aggregation of data, Pangrazio and Sefton-Green (2022) explain:

Only when data is understood as having consequences will we be able to resist, reimagine and rearticulate datafication processes. While the kind of harms – lack of privacy, surveillance and misrecognition – are self-evidently brutal and unfair we need not let only forms of exception define acceptable norms. The fact that the effects of datafication are significantly socially unequal only compounds this challenge. (p.206)

Building upon the insights of these authors, this dissertation advocates for an approach to digital literacies that considers not only the individual human as individuating but also the digital object and its processes of concretization, design, datafication, and algorithms. Individuation, in this context, is understood as an ongoing process of temporarily resolving tensions emerging through relations. As illustrated in vignette two with Gary, his individuation and the concretization of Instagram are entangled processes, giving rise to temporary resolutions of tensions and distributed agency. In these conditions, it is not always obvious who are the doers and who are the deeds.

This perspective challenges the human-centric notion that digital literacies are produced and learned by humans and that literacies can be neatly categorized into specific domains such as data literacy or algorithmic literacy. Instead, I argue for a holistic understanding of digital literacies that can only be achieved through the examination of these processes in their entirety. Such an approach requires a cross-disciplinary perspective that transcends the boundaries of any single academic or educational field.

7.3. Toward a Diffractive and Speculative Approach to Digital Literacies

Understanding agency as a nonbinary concept that does not reside solely within individuals, creates opportunities to explore alternative spaces for action and education in the context of digital literacies. This perspective invites us to reconsider what aspects should be the focus of digital literacy initiatives.

The vignettes presented in the two threshold chapters offer insights into the everyday digital experiences of individuals and collectives. By bringing to light the power dynamics that both constrain and reshape sociogenic principles and the collective

individuation of participants, the mapping of technicity and emerging agencies becomes apparent. When recalling how they learnt to use digital objects, Miles and Dave acknowledge that these objects, by making them discover the “other world”, have impacted their sociogenic principles and individuation. Digital objects and learning how to use them, change their way of seeing their world, preparing them for their arrival in Canada. In this section, my exploration delves into the possibilities offered by digital literacy education and research that prioritize these powerful relationships and positions. Consequently, this thesis advocates for a diffractive and speculative approach recognizing that the phenomenon I seek to capture is multifaceted, and ever-changing. Moreover, this approach is future-oriented, recognizing the need to anticipate and adapt to the dynamic landscape of digital phenomena.

In this thesis, I have endeavoured to apply an approach that transcends conventional domains of expertise, including critical literacies, communication, sociology of races, computer science, philosophy, and geography, among others. This interdisciplinary perspective proves fruitful in revealing the numerous dimensions of technicity that permeate not only digital objects but also institutions, collectives, and individuals. It also aids in more precisely identifying the boundaries of indeterminacy and unpredictability. The adoption of a diffractive approach also facilitates a deeper understanding of the design, algorithmic, and datafication processes that play a pivotal role in shaping digital objects. By employing this approach, we can gain valuable insights into the intricate workings of these processes.

We come back to Amy, who expresses the need to listen to podcasts during her daily transit. A diffractive approach to digital literacy education considers Amy as an individuating being, in relation to her phone and headphones, the podcast platform, and the podcast she listens to as concretizing digital objects. There is also the transit mode as a public space and the timeframe in which this phenomenon unfolds (a weekday morning during the pandemic). From this specific agencement, it becomes possible to analyze what is produced in terms of emotions, collective experiences, datafication, as well as economic, political, and educational dimensions. For example, which values are shared? Which stories are audible? Which values or stories remain silent? In so doing, this diffractive approach does not “only” require reading several perspectives but also encourages us to look forward and question what could be possible otherwise.

Questioning both the present and the future provides a deeper understanding of what actions are possible and opens up the potential for new possibilities and relations. It is important to clarify that this awareness alone may not necessarily bring about significant changes in how private companies and governments handle our data, for instance. However, this perspective allows us to recognize that within every agencement, there are elements of indeterminacy, and therefore new possibilities.

This acknowledgement of indeterminacy and the distributed nature of agency highlights the complexity of power dynamics and the potential for transformative actions to arise from unexpected sources within the agencement.

The example of Twitter toward the end of 2022, serves as a significant illustration within this perspective. In response to Elon Musk's acquisition of the platform and his managerial decisions, numerous individuals closed their Twitter accounts and migrated to decentralized, open-source platforms. While Twitter is not the sole platform to witness user exodus (consider the cases of Myspace and Friendster, once popular in North America before being abandoned), this instance is noteworthy as it represents one of the earliest instances of users actively turning toward open-source and decentralized alternatives.

While acknowledging that the open-source platform is not without its own set of challenges, including issues related to discrimination and privacy (Stamos & Shah, 2023), it nonetheless demonstrates that alternatives can still thrive in these societies of control, as described by Gilles Deleuze (1992). This example highlights the potential for user agency to manifest in resistance against dominant platforms and the pursuit of alternative spaces that align more closely with individuals' values and desired modes of interaction.

Indeed, the differences between proprietary and open-source platforms carry significance, particularly in terms of raising awareness regarding data manipulation, which may not have been apparent during previous platform transitions. This recognition emphasizes the role of digital literacies as critical and a potential catalyst for change.

Lury and Wakeford (2012) argue that turning to speculative methods "require their user to reflect critically upon value, status and significance of knowledge today" (p. 3). This approach encourages shifting the focus from digital objects to broader social

issues and discrimination, while also questioning the role that digital objects play within these contexts. Instead of solely concentrating on the present state of affairs, this perspective invites us to explore the potential for what can emerge, particularly in the margins of indeterminacy as elucidated by Gilbert Simondon (1958, 2005, 2007).

7.3.1. The Becomings of Digital Literacies

In the current context, it becomes feasible to speculate about the potential impact on digital literacies when digital objects are seen as integral components of temporary, metastable, and relational systems. This perspective challenges the notion of digital objects as neutral devices and prompts us to consider them within the broader context of larger systems.

By considering the margins of indeterminacy, we recognize the capacity for transformation and change within complex systems. This shift in focus moves beyond a fixation on the current state of digital literacies and prompts us to envision alternative possibilities and potential futures.

Considering the vignette featuring Kevin, the focus would not be on utilizing Google Maps “wisely” or considering not using it anymore. Instead, speculative approaches prompt us to critically analyze the potential for discrimination against certain individuals when employing such digital tools and explore alternative courses of action.

Moreover, as illustrated in Yuki and Luke's vignette, the responsibility for digital literacy extends beyond individual agency alone. It becomes situated within agencements, encompassing various dynamics and interactions. This understanding highlights the contextual nature of digital literacies and the collective dimensions that shape them. Additionally, the productive role of digital objects needs to be recognized in educational practices as Abel's vignette shows.

As this research embraces the existence of indeterminacies and unpredictabilities, it recognizes that definitive answers or a rigid description of a singular, predetermined process may not be attainable. Instead, the following manifesto should be regarded not as rigid rules but as thresholds that concretize momentarily the sociopolitics of technologies, the technicity of this moment and possible pedagogical and policy responses.

7.3.2. Toward a Manifesto for Digital Literacies

To conclude this chapter, I propose a manifesto for a digital literacy framework that aims to articulate a position based on the investigative work conducted. It is important to note that this manifesto is not intended to be prescriptive, and its statements should be adjusted according to the specific agencements individuals find themselves in.

1. Each participant of the agencement has a story which informs them.

Within the considered agencement, participants are individuals including the researcher or the educator, the digital objects, and other elements that can arise, such as a worldwide pandemic. Each of them has stories and values that shape them. They can sometimes be contradictory. For example, the contrasting results obtained when comparing search engine queries in China and North America, as illustrated by Ani, underline the influence of cultural, political, and societal factors on these digital objects.

Additionally, if individuals, digital objects and institutions are well-known actors in these relationships, others can be less evident. For example, the vignette of Yuki and Luke reveals into visibility another actor, the company providing the portal for post-secondary education institutions. As Castañeda and Williamson (2021) explain, these new edtech actors can affect edtech discourses, practices and policies. Consequently, mapping all the participants of the agencements is crucial to acknowledge all the stories that are at play. Understanding them is the first step in recognizing the emerging power dynamics in the moment.

2. Individuals are made of stories and individuate collectively through emotions and relations.

Affectivities and emotions need to be acknowledged as levers of individuation. Too often silent in most of digital literacy frameworks, affectivities and the collective are nonetheless part of any processes of individuation. Yuki and Luke's vignette underlines the importance of emotion in the emergence of a collective when trying to gain a semblance of power during the frustrating and stressful online registration process for their courses.

3. Digital objects are never neutral: they share the stories and technicities of their creators.

Investigating the stories of each participant is crucial in identifying potential discrimination. Moreover, considering the stories and values of digital objects leads to a shift in focus, moving beyond their mere use toward an examination of how they shape our perception of the world. This is clear in the case of Google Maps, where the influence of the platform on the understanding of geographic spaces becomes apparent. As seen in different vignettes, audible and visible stories are often the dominant ones, thereby silencing stories of individuals who are members of oppressed groups. Recognizing this power imbalance might enable educative actions to mitigate potential discrimination.

4. Design, datafication, and algorithms should be analyzed together in terms of how they approach the world.

These three processes, design, datafication and algorithms, are part of the same digital literacy framework and should not be considered separately. Several scholars tend to focus on either datafication literacy or algorithmic literacy. This framework is a call to consider them together within the bigger umbrella of digital literacies as these processes cannot be conceived separately. Indeed, whether it is through the examples of Instagram, TikTok or even WeChat, the three processes are seen as complementary and interdependent in conveying their values and perceptions of the world.

5. Relations between individuals and digital objects are always productive.

As inherently non-neutral objects, digital practices play a significant role in shaping all participants within an agencement. It is crucial to acknowledge the reciprocal nature of this relationship, as exemplified in the vignette of Gary. In his experience, he did not only find social validation but also navigated through a critical phase of his individuation. This also highlights how the relationship between Gary and Instagram triggered the emergence of the digital subject, which is based on the aggregation of Gary's data used by, among others, the social media platform.

6. Shifting the focus from individual skills toward a collective approach.

This focus would support a collective individuation, critical for both individuating individuals and concretizing digital objects. As seen above in the different vignettes, digital objects can either overlook or deny collective individuation, as in Abel's experience or, conversely, enable the emergence of a collective, as in the case of Yuki and Luke. The key question then becomes how education or digital literacy practice can actively support and reintegrate the collective as an active participant in these relationships.

I follow Allan Luke (2018) when he contends:

How we can enlist and harness these media to learn to live together in diversity, mutual respect, and difference—addressing complex social, economic, and environmental problems while building convivial and welcoming, just and life-sustaining communities and societies—is the key educational problem facing this generation of young people and their teachers. This is an ethical vision and an ethical challenge. (p. 186)

Shifting the focus from individual ability to a collective approach does not aim to diminish or dilute responsibility in Barad's (2007) sense. Instead, it recognizes that responsibility is not solely borne by individuals but extends to collective entities, communities, and systems. It also allows and favors the existence of diverse stories, different-in-themselves. Embracing a collective approach allows for a more comprehensive understanding of the complex dynamics and interconnectedness involved in various issues and challenges.

Within a collective framework, responsibility becomes distributed and shared among different stakeholders, emphasizing the importance of collaborative efforts and collective decision-making.

7. Dealing with the not-yetness of digital

Dealing with indeterminacies, which encompass uncertainties and possibilities, necessitates a willingness to embrace risk-taking when designing what does not yet exist but holds potential. Collier and Ross (2017) emphasize the significance of maintaining a pedagogical space for uncertainty, recognizing that certain dimensions of technologies and practices are still unknown and subject to ongoing evolution. In such circumstances, conducting a thorough analysis of risks becomes crucial. As Jen Ross (2022) explains:

speculative methods, including in “live” learning contexts, must tread a fine line between risk-taking and responsibility. Speculative work can be wild and imaginative, but researchers must also take seriously its potential role in interrupting and reconfiguring learning futures, not only in theory, but in practice. (p. 178)

This analysis should consider various factors, including the types of risks worth taking and those that need to be avoided. It is essential to evaluate the potential impacts of these risks, not only in terms of their scope and magnitude but also in relation to specific stakeholders or communities who may be affected. By carefully assessing and understanding the risks involved, we can make informed decisions and navigate the uncertainties in a responsible manner.

8. Acknowledging who or what is at risk

As each participant is informed by their stories, it becomes important to think of who or what is at risk. Abeba Birhane (2021) suggests the use of a relational approach:

Given that harm is distributed disproportionately and that the most marginalized hold the epistemic privilege to recognize harm and injustice, relational ethics asks that for any solution that we seek, the starting point be the individuals and groups that are impacted the most. This means we seek to center the needs and welfare of those that are disproportionately impacted and not solutions that benefit the majority. (p.5)

Rather than focusing solely on the majority, it is crucial to pay particular attention to what or who is potentially left behind. By acknowledging these possible impacts and examining the impacts of algorithms, participants can reclaim agency and power. Initiatives, such as the one described by LaPensée & Lewis (2011), provide insights into the various dimensions of digital literacies from the perspective of specific communities. In this regard, it is important to recognize the positionality and stories of all actors involved, including researchers and educators. Research and education are inherently value-laden, and this non-neutrality must be acknowledged. In this research, as a white, educated, middle-aged woman, my positionality played a critical role, and another researcher with a different background would have approached the same topic differently. Recognizing the uniqueness of each research or educational practice ensures the necessary rigour in our endeavours.

9. Taking things in the middle: concretization and individuation started long before any digital literacy intervention.

These processes are equally important. Any digital literacy practice emerges from an individual who is already individuating and an object that is concretizing. The design of these objects is built on the mental model, which are the routines the “average user” has integrated. In these conditions, any intervention during these processes needs to acknowledge the temporality of the action and the needs emerging in this precise moment.

Recognizing that we take things in the middle also acknowledges that individuals utilize digital objects beyond the institutions or activities for which they were designed. Indeed, as David Buckingham (2020) explains, the use of technology in school or community settings, often fails to connect with what individuals are doing with technology outside these institutions. Consequently, individuals are rarely invited to reflect upon the technicity in which they live.

10. Embedding social, cultural, and political aspects of digital practices in digital literacy framework

Learning how to use a digital object is important but not sufficient on its own. There is an imperative to not stop there as the values and stories that shape the object can and will impact the individual, as Miles and Dave recognize when they explain that their use of digital technologies prepare them for the “other world.”

Various vignettes exemplify how the situated knowledges (Haraway, 1988) of participants and their sociogenic principle (Wynter, 2001) remain largely hidden within the realm of digital objects. These vignettes shed light on the hierarchical dynamics in the transmission and display of knowledge, where participants are often positioned as passive recipients of predetermined visible knowledge. In this context, individuals lack agency to determine which knowledge is made visible or concealed, further reinforcing the imbalance in the relationship between participants and digital objects. Recognizing and addressing these imbalances is crucial within digital literacy frameworks. For educators as well as researchers, this means an examination of digital objects and individuals that are actors of the digital practices: Which stories are present? Which are silent? What are the processes in action? Recently, scholars suggested frameworks to help educators ask these questions. For example, in the context of queer media Literacies, Van Leent and Mills (2018) provide a valuable framework enabling educators

to address gender normative and heteronormative assumptions within media texts. This framework allows educators to bring awareness on this topic and to question representations of sex and gender, rights, historical or cultural assumptions in different texts.

11. Reaching a collective understanding in terms of responsibility, agencement, becoming

The focus of the framework needs to be on the collective aspect of these practices. As demonstrated in each vignette in this thesis, even mundane practices on individual mobile phones impact several cultural, social, and political dimensions. A collective and holistic approach is then needed to enable the emancipation of the individuals and collectives. Understanding the broader implications of digital practices can help define educative priorities. For example, when TikTok forbids political content, what does that mean in terms of stories that are shared through the platform? What are the political, collective, and social implications? What can be done at the level of educators or scholars?

Trying to answer the question of what could be different requires some ethical considerations that, as reminds us Abeba Birhane (2021), are specific to each society:

What society deems fair and ethical changes over time and with context and culture. The concepts of fairness, justice, and ethical practice are continually shifting. It is possible that what is considered ethical currently and within certain domains for certain societies will not be perceived similarly at a different time, in another domain, or by a different society. (p. 6)

Diffraction and speculative methods require ethical considerations adjusted to the specific context of action. Jen Ross (2022) acknowledges that these methods imply, among others, balancing risk and responsibility and responding to unintended consequences.

7.4. Conclusion

This chapter aims to provide guidance for future digital literacy practices, frameworks, and research. The first section discusses the thesis findings in terms of power, sociogenic principles and collective individuations. It also recognizes that these

power relationships, arising from the interactions between individuals and digital objects, illuminate the technicity of our society. This understanding helps us to imagine digital literacy frameworks that account for distributed, human and nonhuman agencies.

Locating agencies enables the identification of potential levers of change that can be supported. The suggested approach is both diffractive and speculative. A diffractive approach is necessary to embrace a broader and renewed perspective on digital literacies. It encourages us to consider the interconnectedness and entanglements between various elements, including technologies, practices, and socio-cultural contexts. This approach moves beyond linear thinking and recognizes the complex and dynamic nature of digital environments.

Additionally, adopting a speculative approach allows us to rethink and reposition the issues at hand. By considering alternative possibilities and envisioning new futures, we can explore different pathways for addressing challenges and driving change. This speculative approach is grounded in the present reality while allowing us to imagine and explore potential solutions that may not yet exist. It encourages us to question established norms and practices, opening up space for innovative thinking and transformative action.

The aspects outlined in the manifesto for framing digital literacy interventions intentionally maintain a broad scope, as it is recognized that power relationships, technicities, and agencements vary and evolve depending on the specific context and time. Rather than being prescriptive, the manifesto emphasizes the need for contextualization and adjustment to align with the participants, users, and designers of digital literacy interventions.

For example, in this research, each participant is unique and is informed by a specific sociogenic principle that influences the perception of their worlds. Miles who arrived from the Philippines at the onset of the COVID-19 pandemic, remains in touch with her friends through Facebook while Gary, born in Canada to Sikh parents used Instagram to find some social validation. In these instances, digital objects allow them to temporarily resolve a tension that contributes to their psychic and collective individuations. Reading their words through theories such as individuation or sociogenic principles or digital objects taught us to approach each individual and digital object not

only in their specificity but also how this uniqueness is articulated through different collectives such as the community settings in which this research took place.

By acknowledging the contextual nature of power dynamics and technological practices, the manifesto allows for flexibility and adaptability in addressing the diverse needs and complexities of different situations. It emphasizes the importance of understanding the specific sociocultural, institutional, and technological contexts in which digital literacy interventions take place. Contextualization ensures that digital literacy practices are tailored to the unique characteristics, challenges, and aspirations of the individuals and communities involved. It encourages a responsive and nuanced approach, recognizing that what works in one context may not necessarily be applicable in another.

Chapter 8. Conclusion

Upon concluding this dissertation, it is time to reflect not only on the research process but also on how each theoretical and methodological foundation has made a distinct contribution. I also take time to reflect on the contribution of this study as well as its limitations.

The thesis began by acknowledging the limitations of current digital literacy frameworks in understanding the complex social, cultural, and political implications of the relationships between individuals and digital objects. Two main questions emerged: What are the daily relationships between young people and technical objects? And how can we approach digital literacies to consider both young people and technical objects as well as their social, cultural, and political dimensions?

Throughout the five-year investigation, the research questions have undergone a transformative evolution, guided by the concept of thinking with theories, as pioneered by Alecia Jackson and Lisa Mazzei (2013). Thinking with theories acknowledges that the theories we encounter are intricately woven into generations of thoughts and actions. Initially, the focus was on conceiving a different framework for digital literacy. However, as the study progressed, the scope expanded to encompass the transformative processes of both individuals and digital objects, and their implications experienced by the participants.

In the context of the global pandemic, this research was conducted with an awareness of the uncertainties prevailing during these times. In addressing the research questions, I have endeavoured to develop innovative theoretical and methodological frameworks for this study. By acknowledging the transductive nature of the technicity inherent in technical objects, these frameworks enable an examination of the multifaceted dimensions—individual, collective, social, cultural, and political—of the relationships between individuals and digital objects.

In my initial framework, I employed a flat ontology to gain a deeper understanding of the participants involved in these relationships. Drawing on the insights of Gilbert Simondon and other contemporary scholars, this thesis delved into the various processes that emerged from tensions within metastable milieus and examined how

these tensions are temporarily resolved. By considering these processes, the study sought to comprehensively explore the social, cultural, and political dimensions of the participants, encompassing both humans and more-than-humans. This approach enables a more nuanced examination of the nature and evolution of these relationships. Subsequently, the research transitioned from a flat ontology to a relational ontology, expanding the analytical lens and further enriching the understanding of these complex dynamics.

Indeed, in this research, each participant, human and more-than-human is seen as different-in-themselves. In this optic, even when study-participants I observed or interviewed shared similarities, such as their age (between 14 and 30 years old) or the experience of moving to a new country, viewing each participant as unique, with their distinct sociogenic principles, helped this study avoid potential generalizations. This approach allows for multiple readings of phenomena, fostering a nuanced understanding of the complexity and diversity of the relationships between individuals and digital objects. By embracing this approach, this thesis strives for an inclusive analysis of the digital phenomenon that considers the diverse perspectives and experiences of all participants.

Through the convergence of theories and ethnographic investigations conducted within two distinct community settings, namely DownTown and NewTown, as well as online, two significant thresholds, as conceptualized by Jackson and Mazzei (2013), have emerged. Within these thresholds, the thesis incorporates ethnographic vignettes that serve as rich, descriptive narratives exploring relationships between participants. Through in-depth analyzes, these vignettes introduced in Chapters 5 and 6, delve into the intricate dynamics among individuals, collectives, institutions, and technical objects. The vignettes offer detailed insights into the lived experiences and interactions of the participants, shedding light on the diverse perspectives and implications involved. The research acknowledges the various flows of power, knowledge, and affectivities that permeate and shape these relationships.

To acknowledge the differences-in-themselves of each participant, the thresholds are intentionally kaleidoscopic in their approach. The discussion section, Chapter 7, synthesizes and highlights different aspects, such as the position of individuals in these thresholds and the definition of digital objects as entangled processes of design,

algorithms, and datafication, as well as an analysis of their position in various situations. Drawing on the insights from the first part, the second section of this chapter outlines a manifesto of a digital literacy framework focusing on diffractive and speculative methods. This manifesto emphasizes the importance of developing digital literacies that enable both individuals and the collective to navigate the complex relationships between themselves and digital objects, while also taking into account the broader social, cultural, and political implications of these relationships.

Moreover, from the objective of conceiving how a digital literacy framework can help capture the realities of the relationships between individuals and digital objects, several key findings emerge. By linking thinking with theories about the different findings of this research, a definition of the digital object is outlined. Drawing from Gilbert Simondon's insights (1958) on the nature of technical objects and their modes of existence, three additional key processes have been identified that need to be analyzed together to fully understand the digital object: design, algorithms, and datafication.

These processes are intricately interconnected and continuously evolving within a metastable milieu, resulting in a state of perpetual indeterminacy. Consequently, it is imperative to perceive the digital object as a complex and dynamic system, susceptible to constant transformation and adjustment. Moreover, the digital object is not merely a passive entity but holds inherent values that shape its significance and influence within the broader context. By examining these three processes in concert, we can gain a more nuanced understanding of the digital object and its role in contemporary Western societies. However, it is important to recognize that this understanding is always provisional and subject to ongoing revision, as the digital object continues to concretize in response to changing social, cultural, and technological conditions.

By redefining the participants involved in these diverse agencements, it becomes possible to analyze the emergent phenomena resulting from their relations. This analysis encompasses various aspects, including affectivities, emotions, psychic and collective individuations, as well as sociogenic principles. Through this examination, a deeper understanding can be gained of the social, cultural, and political dimensions at play. By considering the circulation of power dynamics, the research aims to shed light on the intricate interplay between participants, their experiences, and the broader sociopolitical context. This stream of work linking the daily and often mundane activities of the

individual to the geopolitical sphere is critical in identifying where agency is emerging and what are the levers of potential education and power. Nonetheless, this study does not aim to limit itself to a reading of the world and instead, suggests several streams of action for educators and research that are gathered into the manifesto. Rather than being prescriptive, it should be seen as a guideline to be adjusted to the different agencements in which participants, humans and more-than-humans, evolve. Its eleven principles, outline elements to be taken into consideration for whomever wants to do research in the digital literacy stream or wants to expand potential existing digital literacy frameworks.

8.1. Implications for Educators, Policy-Makers, and Researchers

Conceptualizing digital literacies, ranging from individual practices to geopolitical contexts, carries significant implications for educators, policymakers, and researchers.

By reconceptualizing digital literacies as dynamic relationships between humans and more-than-human actors, educators can transcend individualistic perspectives and tap into the collective and distributed aspects of digital literacies. This shift moves away from viewing digital literacies as a static set of skills that individuals need to learn. Instead, it emphasizes the interconnectedness and interdependence of individuals, communities, and the digital environment.

Recognizing the collective and distributed aspects of digital literacies enables educators to acknowledge the social, cultural, and technological dimensions that shape these practices. It highlights the collaborative and networked nature of digital literacy development, emphasizing the interplay between various actors involved. This approach aligns with Akwugo Emejulu & Callum McGregor (2019) who call for a radical digital citizenship:

We define 'radical digital citizenship' as a process by which individuals and groups committed to social justice critically analyses the social, political and economic consequences of digital technologies in everyday life and collectively deliberate and take action to build alternative and emancipatory technologies and technological practices (p. 140).

To adopt this approach, educators, relying on their pedagogical and andragogical expertise, must embrace a relational view of digital literacies that acknowledges the complex interplay between humans, digital objects and flows whether it is of knowledges or powers. Furthermore, educators must recognize the importance of collective and distributed forms of digital literacies. This means acknowledging that digital skills are not solely individual attributes but are also shaped by broader societal forces such as power, inequality, and access. In so doing, they may foster spaces for resistance and enable levers of change for a more inclusive and equitable society.

By acknowledging the dynamics of power relationships and their impact on digital literacy practices in the present, policymakers can gain insight into the different sociogenic principles that are valued or silenced within digital objects.

Equipped with this understanding, they can design policies and curricula that are tailored to the specific needs of their communities, thus promoting social justice and preventing discrimination. Indeed, as Gangadharan and Niklas (2019) remind us: “systems powered by bad data, bad algorithmic models, or both lead to ‘high-tech’ discrimination – misclassifications, over targeting, disqualifications, and flawed predictions that affect some groups, such as historically marginalized ones, more than others” (p. 882). Another example was provided by Silas, in this dissertation, when he explained that:

There is really no escaping because I am pretty sure that Facebook knows not only who I am, but they know my race, my sexual orientation, because I do see ads that kind of apply to me, the same thing with Google. (Silas)

But, to tackle discrimination requires a comprehensive understanding of how technology intersects with social structures and inequalities. By focusing on what could be different, policymakers can identify and address gaps in digital access and skills and ensure that underrepresented groups are not left behind.

This approach depends upon ongoing engagement with community stakeholders, including educators, community members, learners, and technology experts, to ensure that policies and curricula are responsive to the needs of diverse communities. Through this collaborative and equitable approach, policymakers can promote digital literacies as a tool for empowerment and social change, rather than a source of further marginalization.

Ultimately, this study contributes to the growing body of literature on the relationships between individuals and digital objects, and how these interactions impact individual, collective, social, cultural, and ideological domains. By analyzing the complex dynamics that emerge from these relationships, this study responds to the call made by several scholars such as Luciana Pangrazio (2016) and Noah Golden (2017) to reconceptualize digital literacies.

One of the key contributions of this study is its rigorous analysis of the digital objects themselves and the processes that give rise to them. By taking these factors seriously, we can gain a more nuanced understanding of the role that digital objects play in shaping contemporary society. Through this analysis, we can identify how digital objects are designed, how they function, and the impact they have on individuals, collectives and broader social structures.

Moreover, this study also highlights the need for a critical approach to digital literacies that considers how digital objects shape our perceptions, behaviours, and values. By engaging with these issues, we can begin to develop more sophisticated and nuanced approaches to digital literacy frameworks.

8.2. What I have learned During this Process

As discussed earlier, this research has the potential not only to contribute to the complexification of perspectives but also to open new avenues for educators, policymakers, and researchers. Moreover, it has provided me, as a Ph.D. student, with the opportunity to embrace complexities, discover novel interpretations of the world, and cultivate mindfulness regarding daily instances of discrimination.

As an educator, the temptation to simplify realities for learners is understandable. However, the relationships with digital objects are inherently intricate, demanding a deeper exploration beyond mere technicalities to comprehend their impact on social, cultural, and political levels. Throughout this research, while I had already acknowledged that digital realms are never free of discrimination, the process allowed me to discern the nature of these discriminations, be they social, racial, gendered, or political. This awareness was undoubtedly informed by various theories I encountered, but it became more vivid and complex during the ethnographic study when I engaged directly with

participants. Being in a relationship with participants in Canada provided me with the means to navigate certain tensions I encountered as a European newcomer. This included grappling with perceptions of racism and the enduring effects of colonization. Moreover, as an integral aspect of this relationship, I became acutely aware of my ongoing responsibility in understanding and addressing how these forms of discrimination unfold. This progressive understanding of my positionality and responsibility is reflected in this dissertation and was made possible through the methodology I used.

Upon embarking on my Ph.D. journey, I had extensive experience in qualitative research, predominantly within the socio-constructivist paradigm, employing methods such as interviews and observations. Nevertheless, guided by various courses, extensive readings, and insights from my supervision committee, this research marks a distinct shift toward sociomaterialism. This paradigm de-centres the human from inquiries, acknowledging the agency of both human and more-than-human entities.

While this shift may not have been immediately apparent at the outset of this research and continues to provoke questions, it has allowed me to diversify my engagement with scientific theories. I now incorporate perspectives from Black and Feminist theories, as well as Indigenous scholarship, contributing to a more nuanced and complex understanding of my research topic.

Certainly, this evolving awareness does not lead to clarity but rather steers me away from the pursuit of simplicity. If readers encounter what is perceived as the final version of this research, it essentially represents a metastable stage in the writing—before the emergence of the next tension and its temporary resolution. As I mention below, there are potential future directions of research outlined in this dissertation.

8.3. Limitations and Future Research

This study is characterized as exploratory, aiming to investigate and gain insights into a particular research topic. As with any exploratory study, this research encountered various unexpected events and challenges throughout the research process. For instance, the worldwide pandemic had an impact on the study, altering the planned methodology and access to research participants. Additionally, difficulties arose in

finding suitable community settings that were open and welcoming to young people, limiting the diversity of observations and experiences.

Given the circumstances described, I acknowledge that the research could have greatly benefited from additional observations in different settings. Expanding the range of community settings would have provided a more comprehensive perspective on the experiences and practices of participants, allowing for a broader understanding of the phenomena under investigation. By encountering a wider variety of contexts, the study could have gained deeper insights and identified unique aspects that are relevant to the research questions.

In particular, it is important to tailor further investigations to specific communities and acknowledge the specificities of diverse sociogenic principles. Recognizing and understanding the sociogenic principles at play within different communities would have enabled a more nuanced analysis of the relationships and dynamics involved in the research topic. This approach acknowledges that different individuals may have their own unique social, cultural, and political factors that shape their interactions with digital objects. By tailoring investigations to specific communities, the research would have been able to capture these specificities and provide more contextually grounded insights.

It is important to acknowledge that this study also has limitations and that its theoretical and methodological framework may need to be extended and refined depending on who is using it. While efforts were made to diversify the sources of theoretical knowledge and include scholars of different gender identifications, races, and backgrounds, it is worth noting that the majority of the authors relied upon in this study are still rooted in Western culture. Therefore, an openness to different ontologies and epistemologies is crucial to ensure that this reflection is inclusive and representative of diverse perspectives. This is particularly important as there is a risk of reproducing power dynamics that have historically marginalized and undermined non-dominant knowledges.

Moving forward, it is necessary to expand the scope of inquiry to include a wider range of voices and perspectives. This could involve engaging with scholars and practitioners from non-Western cultures, as well as incorporating interdisciplinary

perspectives that bridge the social sciences, humanities, and natural sciences. Such an approach would not only enrich our understanding of the relationship between individuals and digital objects, but also foster a more inclusive and equitable approach to digital literacy education.

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