UNIVERSITY OF CALIFORNIA

Los Angeles

Reading the Machine:

Digital Reading Practices and the Contemporary U.S. Novel

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in English

by

Chelsea Alexandra Kern

2021

ABSTRACT OF THE DISSERTATION

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University of California, Los Angeles, 2021

Professor Allison Carruth, Co-Chair

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"Reading the Machine: Digital Reading Practices and the Contemporary U.S. Novel," investigates how emerging information technologies—networked devices, software programs, and algorithmic protocols—redefine cultural forms of textual production and reception. Focusing on the longstanding literary form of the novel as a point of entry, "Reading the Machine" develops a new account of the social, material, and aesthetic processes that constitute reading in concert with smart machines and social networks. At stake is an examination of how reading in the digital age has evolved within the larger political and technological systems of digital society. The project thus attends to pressing issues ranging from democratic participation to the racialized and unequal structure of cyberculture itself.

"Reading the Machine" demonstrates how contemporary fictions build pathways for creative, dynamic digital reading on the part of human and nonhuman readers, even as the economic and political infrastructures of digital technologies seek to limit that potential. The four body chapters of the dissertation juxtapose fictional narratives with case studies on hardware engineering, social networks, digital campaign analytics, and artificial intelligence. Central to the argument are novels and short stories about these technologies by prominent U.S. writers: among them, Jennifer Egan's *A Visit from the Goon Squad* (2010) and "Black Box" (2012), Ruth Ozeki's *A Tale for the Time Being* (2013), Gary Shteyngart's *Super Sad True Love Story* (2010), and Jeff VanderMeer's *Borne* (2017).

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University of California, Los Angeles

2021

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ACKNOWLEDGMENTS

Thank you to the members of my committee for their invaluable guidance and support. Allison, thank you for making me a better writer and thinker, and providing a model for everything this project could be. Danny, without your endless suggestions of new internet content, incredible memory for sources, and bank of PDFs, this project would not have been possible. Louise, thank you for asking the right questions, keeping me human, and a healthy dose of tech skepticism. And thank you to Rachel for the conversation that began this project, and many more ideas since.

I owe many more thanks to many more people. Namely:

To Kristen Cardon, for reading every part of this dissertation almost as many times as I have.

To Elizabeth Crawford, for tea at all the right times.

To Comfort Udah, for sanity.

To the *Finnegans Wake* group, for reminding me each week that reading is supposed to be fun.

And to Nicholas, for everything else.

A version of Chapter 3 appears in *Arizona Quarterly*, vol 76 (2020).

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Introduction

In October 1969, just three months after a human being first stepped onto the surface of the moon, a graduate student at UCLA pressed a series of keys on his Sigma 7 mainframe computer, sending the cryptic message, "LO," to a computer at the Stanford Research Institute nearly 400 miles away. The message technically represented a failure: Charley Kline had intended to send "LOGIN," but the system crashed after the first two letters were transmitted. On another level, however, it was a breakthrough: the first message sent via the ARPANET, the early precursor to the now-ubiquitous internet. This first message is a technological marvel, an origin point that marks the beginning of a radical transformation in how humans communicate, conduct business, learn, teach, and think. It is also significant because of the failure that is concurrent with this great success. Because of the specific limitations and parameters of the technology that Kline used to send his message, that message became distorted. The word that the researchers at Stanford read was not the same word that Kline wanted to send. But we might ask, who really sent this message, and what was its content? Was it Kline, for whom the transmission represented an incomplete version of his text? Was it the Sigma 7 computer, which received, as far as it could know, a complete message before shutting off? Was it the cables that carried a 01001100 (L) and a 01001111 (O) faithfully for 400 miles in the form of rapid electrical pulses? And who read this message? Was it, again, Kline's terminal, which interpreted the keystrokes and transformed them into binary code? Was it the Stanford computer, which received a signal representing that binary code, and translated it into letters? Or was it, finally, the human researchers who received an "L" and an "O," either aware or unaware of the message's incompleteness? We can think of each of these nodes as instances of digital reading and writing—the subject of this dissertation. Decades before the internet and digital technologies

became commonplace features of daily life in the United States, the first network message involved many of the ambiguities and contradictions that attend to producing and reading text today, when texts arise out of complex relationships between humans, nonhuman technologies, and the symbiotic configurations that they form together.

The rise of fully networked, always-on computing in the first decades of the twenty-first century has initiated massive changes in the way that humans within these systems interact with each other and our environment. In many places in the world, digital network infrastructures now underpin the workings of telecommunications, entertainment, transportation, business, and other crucial fields. The widespread use of mobile devices embeds everyday human life within a digital, networked environment of social media, entertainment, news, etc., and the "Internet of Things," in which everyday objects such as thermostats, doorbells, and water bottles use "smart" technology to provide extra services, multiplies our access points to this global digital network and introduces new, nonhuman actors into everyday spaces.

Encounters with text in this post-digital world happen more quickly, more frequently, from more sources, and in more diverse forms than ever before.[1] Although the emergence of network computing and machine reading over the last half century is not the first such revolution in textual and reading technologies, it represents a crisis point—or, alternatively, a quantum leap—for reading practices and their sociocultural, cognitive, and affective functions. In 2008, Roger Bohn and James Short estimated that an individual in the United States consumed roughly 100,000 words per day, excluding words encountered for work or school—a 140% increase from 1980 (12). Although consumption of print media declined from 26% of daily words encountered

[1] I use post-digital here and throughout as a temporal marker to indicate, with Florian Cramer "the state of affairs after the initial upheaval caused by the computerisation and global digital networking of communication, technical infrastructures, markets and geopolitics" (13).

in 1960 to just 9% in 2008, digital sources of text, such as the internet and text messaging more than made up the difference, and in 2008 accounted for 26% of daily words encountered, such that Bohn and Short insist that reading words as a percentage of total media consumption in the U.S. actually increased in the last few decades (18). As opportunities for reading multiply, they also diversify: text comes to us through social media posts, text messages, news headlines, user interface menus, emails, street signs, bus schedules, and, occasionally, print books. It is difficult to define reading as an isolated activity, as reading text reveals itself to be, as it has long been, integrated with the fabric of everyday life. At the same time, reading is also becoming less mundanely human—or at least human in more complicated ways. Much of the text that appears in digital environments is algorithmically or automatically produced: think of package shipment notifications, "personalized" news and social media feeds, or search engine results. Each of these examples relies on technology that "reads" human user input and data and produces text to be read by both humans and further iterations of nonhuman reading technology.

"Reading the Machine" asks what it means, and what it will mean, to read under the conditions of modern technology that render human experience distributed, networked, mediated, and surveilled. The project takes up and pushes back against conversations about reading that worry about reading's imminent demise. The kind of reading that Bohn and Short measured in 2008 (and especially the kind measured in their latest 2013 report, when print media was not deemed significant enough to include in media consumption data) is not the kind of reading whose obituary appears in the *Atlantic*'s "The Decline of the American Book Lover" (2014) or the *Washington Post*'s even more ominous "The Death of Reading Is Threatening the Soul" (2017). For these writers, reading is a particular kind of activity, limited in scope, and with very specific cultural value. As the titles suggest, they position reading as something accessed

through books, which can be loved, which can die, and which is somehow connected to the soul. As early as 1991, in "The Death of Reading: Will a Nation that Stops Reading Stop Thinking?" Mitchell Stephens lamented the decline of a "force that, according to a growing consensus of historians, established our patterns of thought and, in an important sense, made our civilization." For Stephens and these other writers, reading goes hand in hand with being human.

Yet, as the opening anecdote suggests, reading and being human are both made more complicated by the growing presence of nonhuman mediators in our relationship to text and to the world. Reading alongside and with digital technologies often occurs in concert with nonhuman devices that mediate and even direct or co-opt the reading experience. In this project, I ask what kinds of historical, social, neurological, and literary processes constitute the act of reading under such conditions? Thinking about post-digital reading entails thinking about the relations, interactions, and oppositions between human and nonhuman readers, each of which approaches reading with set of affordances and assumptions about what reading is and can be. The ramifications of this reading extend to all sectors in which reading is done—that is, all of them. As literary critic Sam Cutting explains, reading practices "engender the contestation of material shapes and meaning which condition social relations—they are practices with constantly changing ethical consequences" (n.p.). Emerging reading practices affect what is considered legible for readers, and how that material will be interpreted through the organs of reading, whether human or algorithmic.

From the screens that increasingly demand our visual attention, to the text-based interactions that dominate our online life, to the intelligent machines that every day perform reading more quickly, accurately, and extensively than human beings ever could, reading in the twenty-first century takes many forms. And yet, in defiance of handwringing about the death of

reading, contemporary novels still serve as one of the primary staging areas for thinking about reading and digital practices. Studies in digital reception have often looked at resources such as Goodreads, Twitter, and other forums for literary discussion as important locations of literary engagement online, to explore how traditional reading practices continue in digital spaces.[2] In this project, I focus instead on how literary works respond to and illuminate the new reading practices that are native to digital culture. In *Network Aesthetics* (2016), Patrick Jagoda parses the network as the dominant model for technological, social, and epistemological relationships, noting the complex ways in which human and nonhuman actors are always entwined together in material and immaterial network arrangements. For Jagoda, "Aesthetics serve as one critical interface between the nonhuman and human aspects of networks. Even as nonhuman entities and processes play an increasingly important role in our world—through network protocols, algorithmic stock trading programs, and web systems that change with real-time big-data processing—aesthetic encounters offer human beings a way of speculating about and intervening in such systems" (32). Like Jagoda, I see art, and particularly the novel, with its history of representing human behavior, consciousness, and society, as an important tool for mapping the new textual landscape that emerges through digital technologies. Novels that describe or take cues from contemporary technological conditions render networked forms in the logic of the codex. To read such a novel is to encounter digitality removed from its native environment, made visible through defamiliarization. In this way, novels theorize digital reading as we read them.

Literary fiction of the twenty-first century, however, has been slow to take up contemporary digital technologies as subjects, or even as pervasive elements of the fictional

[2] See Sedo, "Reading Reception in the Digital Era."

worlds that they describe. Alexander Manshel's survey of information technology in recent fiction reveals a lag in engagement with contemporary information technology in literary prize-winning books (49). In literary fiction that does engage with such technologies, Manshel argues, authors tend to lean into the mysticism of new technologies, rather than their banal functions in everyday life. Don DeLillo's *Zero K*, for example, features network technologies that are the conduit for a mind-breaking onslaught of content—"the digital wilderness"—that is more conceptual than actual (DeLillo 269). As far as practical use, the characters' smartphones seem only to facilitate voice calls. In *Control and Freedom: Power and Paranoia in the Fiber Optic Age* (2005), Wendy Hui Kyong Chun implores artists and scholars alike to attend to the particularities of network systems rather than subscribe to myths of technological omnipotence that stifle useful analysis. Chun's precise devotion to the actual workings of the systems she writes about is indeed necessary for this kind of critique. But there is also a place for the totalizing technological sublime that prevails in some literary work. Balanced with attention to the realities of networked systems, devices, and their functioning, the imaginative mode of this fiction allows for larger reimaginations of the relations between humans and our technologies. With Jerome McGann (*Radiant Textuality*, 2000), I am interested in the ways that traditional texts already display some of the qualities that we associated with digital textuality, and how reading these texts can help us to illuminate the new strategies of reading that digitality requires. The texts that form the backbone of the project are concerned with how the increasing capabilities of nonhuman technology threaten human agency and coherency. They wonder about the effects of digitality and the internet on the human capacity to read and process information. And they describe an array of new conditions, behaviors, practices, and questions that attend to the intersections between human and nonhuman reading.

My dissertation moves between the human and nonhuman, the digital and analog, the literary and the technical. The first half of the project describe encounters between human readers and the screen-based devices and uncertain conditions that they face in digital and networked environments. In the second half, I focus on the nonhuman actors that move over and through human reading: surveillance networks and artificial intelligences. In all of these reading environments—from scrolling on a touchscreen device, to navigating online archives, being farmed for data, or collaborating with Artificial Intelligences—human readers use reading to create narratives of their experience that make sense of rapidly evolving digital worlds. They are creative and active readers, as are the nonhuman actors who read alongside them and whose capabilities are transforming the very definition of reading and writing.

1. Reading

Andrew Elfenbein points out that every instance of reading, whether of a novel or a text message, is a complicated process, as a reader must simultaneously be "moving eyes to perceive symbols, assembling symbols in words, parsing words as sentences, translating sentences into a mental language, creating a mental model of what has been read, supplementing it with inferences drawn from semantic memory (typically, general factual knowledge) and episodic memory (memory for events that we have seen or experienced), finding appropriate emotional reactions to that model, reasoning or making decisions about what has been read, and much more" (17). In a confident reader, these operations occur effortlessly and beneath notice, but are a significant investment of cognitive energy. As Maryanne Wolf explains, the human brain is not specifically adapted for reading, so the brain processes that govern reading must be forged, slowly and painstakingly, as a human learns to read for the first time (19). As an interaction

between a reader and a text, the process of reading is a demanding, holistic experience that draws on physical, psychological, and social competencies. This is the definition of reading that this project takes up to describe reading activities that range far beyond the reading of literature. By these criteria, reading is everywhere, all the time, for many people: as of 2013, 91.9% of adults in the United States demonstrated basic literacy in their native language, though this number does not account for systemic literacy divides between socioeconomic, racial, and ethnic groups (OECD 237).[3]

It is important to note these divides, as experiences with reading are uneven across geographic, racial, class, and cultural communities, both in the sense of basic literacy and in its social functions. Many colloquial definitions of reading use reading as a shorthand for familiarity with a corpus of shared texts with specific cultural capital (or at least, investment in performing such familiarity). This is the kind of reading that Stephens and others lament in their opinion pieces, where they equate reading with the reading of novels and long-form nonfiction. While various kinds of textual literacy are necessary for different situations, the history of reading in the United States elevates certain, narrow forms of literacy above others. Consider, for example, the way that standardized tests and English syllabi systematically privilege white, Anglo-American cultural touchstones and practices over other categories of reading ability. [4] To use

[3] Data from the 2013 Survey of Adult Skills, a product of the Programme for the International Assessment of Adult Competencies (PIAAC), indicates that 91.9% of U.S. adults read at literacy Level 1 or higher, meaning that they are able to read and understand short texts in order to find specific information. 78.3% read at Level 2, which requires synthesizing two or more ideas and skillfully navigating longer texts. 4.2% of those surveyed did not complete the literacy assessments due to language barriers or disability, but may be literate where other metrics are available. Since the 2013 report did not include data on race, class, or ethnicity, these numbers do not reflect the respectively higher or lower literacy rates for different advantaged and disadvantaged groups.

[4] Standardized tests that assume familiarity with institutions, cuisine, public figures, etc. that are in fact specific to white, middle-class culture discount the considerable textual literacies of

Stanley Fish's terms, the institutions that govern entry into financial, educational and political success in the United States require readers to conform to the reading expectations of narrowly defined interpretive communities in order to navigate the various reading tasks that are required for public life. In practice, however, readers come to texts armed with the textual skills and traditions that circulate in their own communities, whether that means familiarity with the major works of the English canon, knowledge of legal vocabularies, or how to navigate and interpret the affects traded in a Twitter thread. As used in this project, reading is also a culturally vexed activity that is inflected with histories of class and racialized inequality.[5] Thinking about reading in the present and near-future digital environments, therefore, requires attention to the ways in which these historical reading practices and received cultural ideas about those practices change or remain the same as our technologies do.

In fact, as I explore in chapters three and four, the perception of reading as a particular kind of textual literacy that has close ties to cultural identity is the basis for many fears about the advent of new and nonhuman reading. In order to keep pace with evolving technologies, readers must develop new forms of literacy. Digital literacy is a particular kind of textual literacy, in which readers must be familiar with the textual forms that are abundant in digital and networked

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students of color and working-class students. For more, see Eric Grodsky, et al. "Testing and Social Stratification in American Education."

[5] As studies in reception have shown, reading is not merely an interaction between a reader and a text, but also involves the social context in which reading occurs, and in which reading constitutes a social, political act. Richard Hoggart's *The Uses of Literacy* (1957) was a pioneering ethnography of literacy and reading in working class Britain, in which he traced the effects of mass media on working class cultures. In *Reading the Romance* (1984), Janice Radway charted how reading romance novels serves important personal and communal functions for the women in her study. Elizabeth McHenry (*Forgotten Readers,* 2002) demonstrates how African American literary societies provided key services and opportunities for their members, including initiation into public and national discourse. Studies like these demonstrate the far-reaching impact of literacy, reading, and reading communities.

environments (text messages, emails, online forms, PDFs, search results, Wikipedia articles, social media posts of various kinds), and also with the operation of web browsers, apps, social networking interfaces, audio and visual media, and perhaps even markup and programming languages. Reading in digital networks is categorically different from reading in print or other non-networked environments. In *Reading Writing Interface*, Lori Emerson argues that interacting with texts online is "a practice not just of experimenting with the limits and possibilities of writing interfaces but rather of *readingwriting*: the practice of writing through the network, which as it tracks, indexes, and algorithmizes every click and every bit of text we enter into the network, is itself constantly reading our writing and writing our reading." (xiv). Digital networks put readers into contact with other readers, human and nonhuman, all of whom read and write one another. How these new readers, reading contexts, and reading communities navigate the physical, psychological, and social demands of reading is the subject of this project.

2. Digital Textuality

Digitization is certainly not the first radical transformation of text-related technologies. As scholars of book history have long known, and as Marshall McLuhan famously pronounced, "the medium is the message" (*Understanding Media* 7). Successive textual technologies—parchment, the quill pen, the codex, illuminated manuscripts, the printing press, stereotypes, industrialized printing, phototypesetting, and so on—have shaped the possible interactions, practices, and meanings that readers can derive from texts in their various media forms. McLuhan's contention that the printing press with its movable type instantiated a worldwide visual logic of homogeneity, and Johanna Drucker's analysis of the effects of mass-produced books on education, class mobility, and art offer just a few perspectives on the broad material,

epistemological, and affective consequences of changing media technologies throughout human history (McLuhan, *Gutenberg Galaxy* 125; Drucker, *History of the Book* 13-14).

Digital texts, too, generate unique representational forms and contributions to reading histories. The potential to display text through digital devices and using the logic of information technology promises similarly revolutionary transformations in the ways that humans can read and relate to written material. On a visual level, Hayles points out that electronic screens disrupt the stability of letter and word forms, such that these shapes become "flickering signifiers" whose presence, in addition to literally flickering due to the rapid refresh rate of electronic displays, is also flickering in the sense that they exist not as static marks on a page, but as "a flexible chain of markers bound together by the arbitrary relations specified by the relevant codes" (*How We Became Posthuman* 31). Even printed texts, because they are now produced through digital methods, "flicker" in this way. While, as Johanna Drucker argues, letter forms have never been stable markers,[6] digital display technologies render this instability more obvious, as each letter must simultaneously be "understood graphically as a preexisting shape or model, a ductal form created by a sequence of strokes with varying pressures, an arbitrary sign, an image fraught and resonant with history and reference, an arrangement of vectors or pixels on a screen, [and] a digital file capable of being manipulated as an image or algorithm" ("From A to Screen" 93). Letters are simultaneously ideal shapes, traced and traceable forms, symbols of meaning, historical objects, and packets of data. This data, in turn, is composed of the various alphanumerical codes that determine how it appears in its final display, and, as Matthew

[6] Drucker explains that letters are slippery concepts. Because of the infinite potential for variation in the shape of each letter, it is difficult to describe a letter algorithmically, through a set of instructions or parameters: "no single essential *a* exists. A swash letter majuscule *A* in a wildly excessive script face will have elements that could never be predicted from an algorithm responsible for the minimal stroke forms of a three-stroke sans serif *A*" ("From A to Screen" 85).

Kirschenbaum explains, includes the minuscule material traces that digital inscription leaves on its physical substrates (Kirschenbaum 10).[7] To read such a text, either on a screen or on a page, is to enter into a relationship with the technologies, materials, codes, and protocols that, together with the human reader, produce a text as read.[8] Post-digital reading emerges from this relationship, which requires new methods for relating to text and language.

In addition to this visual intervention, digital technologies also open up new formal possibilities unavailable to previous, print-based media. The early days of digital technology were flush with high hopes for the future of electronic literature and hypertext narratives, electronic books that would embrace the branching possibilities of hyperlinking and electronic display technologies. Important examples of these kinds of texts include Michael Joyce's *afternoon, a story* (1990), Stuart Moulthrop's *Victory Garden* (1992), and Shelley Jackson's *Patchwork Girl* (1995). Writers and artists have continued to experiment with electronic texts, as in *Pry*, a 2016 "novel" that requires readers to pinch, swipe, and rotate the mobile device on which they can read the text, or in the works of Young-hae Chang Heavy Industries, an artist group that produces audio-visual-textual works available through their website. However, despite the obvious artistic value of such innovative works, the wider field of narrative fiction, especially where published by a traditional imprint, has not taken up the new formal opportunities afforded by hypertext, digital, electronic technologies. Even with the near ubiquity of digital devices that would allow for readers to access electronic literature, the majority of fiction available for

[7] For more on the material basis of digital data, see Jean-François Blanchette, "A Material History of Bits."

[8] Of course, these different senses of the letter may not come into play all at once for every reader. Nevertheless, the multiple modes in which digital technologies render text make themselves felt in unexpected ways. Consider the effects of screens on reading comprehension and eye strain (Mangen et al., Köpper et al.), or the jarring experience of reading a corrupted or incorrectly encoded text file.

purchase, national bestsellers, the contents of school syllabi, and the winners of international literary prizes are still traditionally formatted narrative texts, whether displayed on a screen or on a physical page (and they are overwhelmingly in print, as the National Endowment for the Arts 2019 Survey of Public Participation in the Arts shows. In 2017, 53% of adults in the United States read a work of literature within the last year, but only 23% reported doing so on a digital device) (44, 55).[9]

While both Hayles and Drucker, among many other scholars of digital culture, have made electronic and hypertext literature their primary objects of study, the continued popularity of print books is why this project takes up the contemporary, conventional novel. These texts can flexibly move across different media, but were always primarily destined for print, and, for the most part, subscribe to the familiar logic of the codex in their layout, if not in their thematic concerns. Novels are far from the most common reading material that contemporary readers encounter, as Bohn and Short's data suggests. However, in our contemporary moment, the institution of the printed novel as a specific media form often serves as a repository for ideas of reading itself. Jessica Pressman argues for the importance of "bookishness" in the era of digital texts, an aesthetic of the book that she says is emergent in contemporary literature that feels threatened (and, paradoxically, reinvigorated) by the rise of digital technologies. As avenues for consuming information proliferate across media and devices, literary texts, Pressman argues, reaffirm their centrality as vehicles for the *literary*:

> Works that adopt an aesthetic of bookishness respond to their contemporary, digital moment by showing how literature retains a central role in our emergent

[9] The 2017 numbers reflect an increase over the 2012 survey, which reported that 47% of adults had read a book in the last 12 months (26).

> technoculture as a space for aesthetic expression and cultural critique. They harness the power and potential, as well as the fears and frustrations, of new media *into* print and *onto* paper. ("Aesthetic of Bookishness")

Pressman's "bookishness" reveals the important role that novels can play in helping us to understand how texts and our reading of them are evolving and will continue to evolve along with the information and digital technologies that threaten their cultural role. Contemporary print texts "exploit the power of the print page in ways that draw attention to the book as a multimedia format, one informed by and connected to digital technologies. They define the book as an aesthetic form whose power has been purposefully employed by literature for centuries and will continue to be far into the digital age" ("Aesthetic of Bookishness"). Texts like *House of Leaves* (2000), which draws attention to its print form by importing the flexibility and branching narratives of digital space, or *Tropic of Orange* (1997), which offers up an alternative, hypertext logic through which to read its characters, bring the aesthetics and possibilities of digital technology into contact with print, thereby rendering the contours of those technologies more visible. In the context of the ever-expanding media landscape, books remain the symbols for reading and literature as cultural values. Novels that imagine our present and near future are especially concerned with their own existence as text objects—crucially as *books*—in this changing technological environment, and so offer abundant examples of reflection on reading, readers, and texts. For this reason, the contemporary novel is the starting point for my project on the broader question of how modern technologies have and will affect reading practices across multiple mediums and environments.

3. Human and Nonhuman Readers

Until the advent of intelligent machines, only human beings had ever used written marks to convey meaning. Reading is a uniquely human skill. Digital technologies, however, present new challenges to conceptualizing readers in the networked, distributed, multiple-actor systems in which humans increasingly find ourselves enmeshed. As Pressman notes, when reading a digital text object, human readers are only one component in the process of producing and interpreting meaning. Whether we are reading text messages, e-books, or online news articles, reading is now "a posthuman activity of technological distribution that involves human and machinic readers in the production and reception of literature" ("The Posthuman Reader" 66). Sending the first networked message between two humans in 1969, for example, required the mediation of two room-sized computers and 400 miles of cables, and such communication would have been nearly impossible without the intervention of transportation or communication technologies at any point in human history.

Hayles follows Donna Haraway's *A Cyborg Manifesto* (1984) in asserting that the conditions of modern life have transformed and to a great extent eliminated the boundaries between human, animal, and machine. With reference to technology, the posthuman emerges for Hayles when humans become linked to intelligent machines to such an extent that "it is no longer possible to distinguish meaningfully between the biological organism and the informational circuits in which the organism is enmeshed" (Hayles 1999, 35). Examples of such coupling include wonders as cybernetic enhancement, the creation of Artificial Intelligences, and advanced medical prosthetics, but also involve modern banalities such as the ubiquitous mobile computer, invisible networks of capital and credit, and social media, each of which extends the boundaries of human experience into new spatial and temporal configurations. Hayles identifies the rise of the posthuman experience as one that troubles, but optimistically extends, the bounds

of the human beyond the physical body without discarding embodiment as a fundamental reality. This project uses posthuman theory as a departure point for thinking about how human relationships with technology demand new articulations of human behavior and identity, without committing to the idea that there is or should be a "post" to the human. Concurrently, I recognize that continuing to insist on the centrality of a concept of humanness for human experience is crucial to understanding how to read, think, and live alongside digital and nondigital nonhumans.

Doing so also ensures that issues of race, class, gender, etc., that have always inflected the different reading experiences available to different readers, continue to be centered in the understanding new reading experiences. Because the effects of digital technologies are felt unevenly between different demographics, applying a theory of posthumanism to human experience in this context more broadly is neither effective nor accurate. Even the question of whether or not someone has access to these technologies is complicated. As Lisa Nakamura contends in *Digitizing Race,* "Rather than a 'digital divide' that definitively separates information haves from have-nots, the Internet has occasioned a wide range of access to digital visual capital, conditioned by factors such as skill and experience in using basic Internet functions such as 'search'" (18). Furthermore, even among users whose access to the internet and its technologies is relatively equal, disparity remains for women, people of color, and other marginalized groups for whom offline experiences of marginalization carry over into digital spaces in various ways. Due to existing histories of visual and textual cultures, these users are already "both subjects and objects of interactivity" as they encounter interactive technologies (Nakamura 16). Necessarily, then, the relationships that grow between users and their technology is shaped by these preexisting offline cultural positions.

Where this project discusses the human as a concept, I acknowledge the posthuman inflection as articulated by Hayles and others, but also place that human-posthuman concept in relation to new nonhuman readers whose reading capabilities are distinct from those of traditionally understood human individual readers. These nonhuman readers range from individual instances of Natural Language Processing programs to the vast and soft-edged apparatus of data surveillance operated by the United States government. James Hodge's assertion that "Digital inscription largely operates beyond human perception and cognition" and that therefore "digital media are in many ways *not for us*" gets at this crucial shift in the weight of postdigital reading and textual practices (72). Hodge is referring to the fact that the vast majority of text that is produced and read every day—including both code and plain text—is read first or exclusively by these nonhuman devices, programs, and systems. Understanding nonhuman reading is therefore essential to any discussion of what it means to read and write with digital technology. New technologies threaten the boundaries of human bodies and self-conception while also solidifying human readers in contrast to emerging nonhuman ones. I am most interested in the ways in which human interface with technology both extends and troubles human capability to process and produce information. Under these conditions, human readers continue to employ reading practices that are grounded in the strengths of reading traditions from the pre-digital world.

"Reading the Machine" explores how humans read and are read by the nonhuman world of digital network technologies. It begins at the surface of the screen, the interface between humans and the digital world, in order to examine how reading on screens and in print engages the body of the reader as they interact with immaterial and material texts. It next explores the

relationships between readers and what they have read, to illuminate how readers forge their own digital memories through narrative. From there, I turn away from the individual reader and towards the nonhuman systems of surveillance that they encounter as they read and are read on the internet and through their devices. Finally, I examine the nonhuman readers who use machine learning and natural language processing to appear iteratively more human every day in their interactions with text. In order to understand the contacts between contemporary literature and the technological narratives that it takes up and in some cases influences, this project pairs analysis of novels with analysis of texts that describe or are affiliated with the technologies and digital practices that motivate each chapter. These texts, whether technical documents, artifacts of social media engagement, or forms of digital art, provide historical context and technical information in addition to serving as fruitful ground for understanding the way that narratives about digitality operate in the contemporary moment. By bringing together these literary and technological texts, and human, posthuman, and nonhuman entities, I read our reading in the highly networked environments where texts now live.

In the first chapter, "Screen Reading," narratives of technological advancement in Jennifer Egan's *A Visit from the Goon Squad* (2010) and "Black Box" (2012) reveal the hidden forms of digitality by placing those forms within familiar print contexts. Compared to neurological and cognitive science accounts of reading, Egan's stories turn on the embodied, intimate character of both digital and print reading. Contra the trope of "virtual" environments, the multivalent interfaces between human bodies and technological objects—touchscreens, handheld devices, LED displays—activate new modes of reading within and through bodies. The second chapter, "Reading and Remembering," takes up Ruth Ozeki's *A Tale for the Time Being* (2013) as a novel in which a central quest for knowledge casts doubt on the reliability of digital

memory systems**.** My analysis here argues that narrative fiction and the form of the Internet Novel, in particular, offers a unique method for capturing and preserving digital experiences. The third chapter, "Reading Data," zeroes in on cultures of reading and being read online via a critical account of Gary Shteyngart's *Super Sad True Love Story* (2010) and the novel's political occasion of big data surveillance networks. Opening with an account of the Cambridge Analytica Facebook data mining story that broke after the 2016 U.S. Presidential election, the chapter identifies forms of human reading in Shteyngart's character of Eunice Park that offer provisional and partial resistance to the regimes of pervasive data collection. In the fourth and final chapter, "Artificial Imaginations," fictional artificial intelligences in Jeff VanderMeer's *Borne* (2016), which present uncanny reading subjects, open onto the question of how human-made algorithms that "learn" to interpret and produce text will shape human experiences of reading in the present and near future. Through this discussion of VanderMeer's speculative narratives, I argue that literary reading in particular has a crucial role to play in preserving difference, surprise, and estrangement as part of the experience of reading, while machine reading ever seeks to assimilate the familiar.

By placing these diverse texts in conversation, I create opportunities to think about reading as our interfaces with technology become ever more complex. The many nonhuman mediators and actors that both subtly shape and overtly intrude into experience of reading in digital environments have precipitated a crisis in the practice of human reading. In order to understand how this situation will or should unfold, my dissertation describes the imbrication between digital textuality and human life that threatens to redraw the boundaries of both. Digital networked forms and logic are most fruitfully displayed, questioned, and transformed in print texts that bring together these new technologies with the older forms that human reading finds

most familiar. Human readers can still play important and fulfilling roles in digital and networked spaces full faster, smarter, and more competent nonhuman reading. My work makes the claim that today's world—structured and maintained by a vast network of digital technologies written in various languages of code—is a fundamentally textual one in quite a literal way. Literary studies, which has made the study of reading and writing its business, is therefore central to understanding the rapidly expanding landscape of textual behavior alongside its political and social implications. I argue throughout that contemporary fictions build pathways for creative, dynamic digital reading on the part of human and nonhuman readers, even as the economic and political infrastructures of digital technologies seek to limit that potential.

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1. Reading Screens: Haptic Narratives on Touchscreen

On January 9, 2007, Apple founder Steve Jobs stood in front of a packed audience at the Macworld convention in San Francisco and announced that Apple had produced a "revolutionary" product, one that, like the Macintosh computer and iPod before it, would transform an entire industry (28:13). He was right—the iPhone was a revolution in the mobile phone industry. Its capabilities and its form continue to define what a smartphone *is*: a slim rectangle with a large touchscreen that takes up the entire front surface of the device. By touchscreen is how many people in the twenty-first century work, play, and communicate with one another. Most importantly for the purposes of this project, by touchscreen is how twenty-first-century readers read.

But in 2007, the idea of a touchscreen interface was still new. How would users, accustomed to the physical buttons and full keyboards of existing smartphones, interact with such a surface? Jobs explained: "We're going to use the best pointing device in the world. We're going to use a pointing device that we're all born with. We're born with ten of 'em. We're going to use our fingers—we're going to touch this with our fingers" (33:18-33:20). On the large screen behind him, a giant hand appeared, index finger outstretched to tap at the iPhone's blank surface. Much of the keynote involved Jobs teaching the audience about touchscreen—the presentation aimed to offer an introductory short course on this brand-new modality of computing. Navigating the iTunes app, he asked, "I'm in my list of artists, how do I do this?" The answer—"I just take my finger and I scroll"—was met with cheers from the crowd (42:31). For an hour, Jobs stood in front of the auditorium and demoed the device, tapping and scrolling on an iPhone in his hand as the display was replicated on the big screen. The motions of his

fingers astounded the audience as he manipulated the screen to play music, make calls, send and receive emails, and browse the internet.

Figure 1: A giant hand appears to tap the iPhone's screen (33:18)

The breakthrough of the iPhone was its use of a capacitive multi-touch screen—a technology that Apple patented—to produce ostensibly individual and yet highly circumscribed touch experiences with digital technology.[10] As opposed to other touchscreen mechanisms that rely on pressure, optical disruption, or even acoustic sensing, capacitive touchscreens work by sensing the electric current conducted through human skin. While special styli or other objects can be used to interact with the screen, it is primarily designed for human fingers. The multi-touch component adds functionality for more sophisticated gestures involving more than one point of contact, such as pinch-to-zoom, dragging, or typing, that use the specific capabilities of the hand. The story of the iPhone is thus a story of human touch. This kind of touch, however, is

[10] During the keynote, Jobs claimed that Apple had invented multi-touch, and remarked "Boy, have we patented it!" (33:54). In reality, multi-touch technology had been in development by multiple groups since the 1980s, and Apple's patent was later challenged and limited in scope (O'Connell 16). See Lee et al. for an example of earlier multi-touch research.

very specific, as Jobs' tutorial on the iPhone's acceptable gestures suggests. iPhone and other smartphones like them have inaugurated a new category of activities: scrolling on social media, checking app notifications, text messaging, and more. As Jobs demonstrated during his keynote, the touch gestures that enable these functions are themselves integral to the construction of those functions. These repetitive, limited motions (tapping, "pull down to refresh," scrolling continuously with the thumb, swiping left or right) are part of the experience of reading on a digital device through which readers access the texts that make up social media, email, and other communications tools. Such interactions with digital devices are *haptic* in that they combine tactile (sensations on the skin) and kinesthetic (sensations in the muscles) sensory experiences. The surfaces of the phone provide tactile information in addition to the kinesthetic perceptions of weight and dimension. The haptic experiences of any given user with any given device will, of course, vary, but the iPhone's industry-defining form creates certain constants across these devices: the experience of reading on a smartphone is one of holding a slim rectangular object that responds to sliding motions across its glass screen. What does that context do to reading? How does clutching a $1000 text as you navigate a busy sidewalk change the reading experience? How do we interpret the texts that slide across our vision as we reflexively twitch our thumbs to scroll down a Twitter feed? What can the textures, motions, and objects of digital reading tell us about how reading is changing—or how it always was?

Figure 2: "This is the size of it. It fits beautifully in the palm of your hand" (40:28).

To answer these questions, I turn to a creative form that has long interrogated the status of reading: the novel. Jennifer Egan's 2010 novel *A Visit from the Goon Squad* was published just three years after the iPhone's debut. *Goon Squad* follows the intertwined narratives of its many characters through multiple decades and literary genres, into a projected future much like our present in which a text message lexicon is ubiquitous and babies who use tablets are a prime market demographic. As its narrative moves through time, the novel experiments with the evolving technologies and representational modes that its characters use to communicate with one another, including forms of digital textuality. In the novel's final chapter, "Pure Language," Alex, an out-of-work music producer, uses his smartphone-like "handset" to do just about everything. His work and social life both require him to "stare . . . goggle-eyed at his handset screen" to accomplish mundane and profound tasks of communication, organization, and leisure (316). The handsets are the last in a series of technological and textual nodes that structure the novel and its exploration of evolving media habits. In the section of the narrative set in the

1980s, for example, a graduate student named Bix spends his time "typing messages to other graduate students they that'll read on their computers, and reading messages they send back" (190). The narrator is skeptical, but Bix believes that "this computer-message-sending is going to be *huge*—way beyond the telephone" (190). The novel's chapters alternate between such punctuated moments in time from the 1970s to 2020s that Egan demarcates partly by way of iconic technologies—digital recording software, the internet, PowerPoint presentations, solar panels, smartphones (or "handsets"), and so on. As these examples suggest, new technologies represented in the novel often represent new reading practices as well. Instances of readers and reading media in *Goon Squad* are plentiful: not only Bix, but also an anthropology graduate student in the 1970s who "unpack[s] her many books, realizing that in weeks of lugging them through Africa, she's read virtually nothing," and a scholar working in the 2020s on a book about "word casings" that have been "drained of life by their Web usage" (81, 324). The novel thus tracks an evolution of reading practices alongside a parallel gamut of reading technologies. Its anxieties about these changes are consistent with other early twenty-first-century narratives of digital technology, in which technology both threatens and promises to revolutionize the relationships between readers, content, and media.

The peak of technological development in the novel finds characters using handheld touchscreen computers—fictionalized iPhones—to communicate, work, and play. In this chapter, I examine the haptic experience of reading on touchscreen mobile devices (e.g., an iPhone or other smartphone) through readings of *Goon Squad* and Egan's Twitter short story "Black Box" (2012), texts in which evolving reading technologies produce tension around not only the emergent cognitive, but also touch-based implications of digital reading. In their engagements with digital platforms in print and as a medium of publication, *Goon Squad* and "Black Box"

bring the aesthetic, cognitive, and social ramifications of touchscreen reading into sharp focus. In line with the larger arc of this project, my argument here is that contemporary print fiction—and Egan's fiction in particular—that centrally and critically addresses digital screens and digital texts render those forms more visible. “Black Box” was first released over the course of nine days on the *New Yorker’s* fiction Twitter account (@nyerfiction) in May–June 2012 and was later published in the *New Yorker* print magazine. Understood both as a standalone story and as an extension of *Goon Squad*, “Black Box” is a hybrid digital-print text that invites questions about the status of its own digital publication life and what it means to encounter texts in new formats. Both “Black Box” and *Goon Squad* present confrontations between traditional narrative forms and new media technologies. In so doing, they illuminate the contours of digital reading aesthetics to outline the complex haptic engagements that readers make with their digital texts.

More pointedly, Egan's fiction suggests that digital reading on mobile devices stages a system of interactions with texts that are often smooth, impenetrable, and minimally manipulable. In this chapter, I first explore how consumer touchscreen technologies produce haptic experiences with reading that are conceptually and physically limited. These experiences demonstrate how slippery digital text is: sequestered behind a glass screen over which fingertips can only slide, and also slippery in time, always updating and interrupted. The process of grasping a digital text is about contending with that slipperiness to take control of the time of digital reading. My analysis of *Goon Squad* investigates, by extension, how the taken-for-granted motions of fingers and hands with relation to a reading device create personalized narratives out of the myriad, slippery digital texts that are temporarily housed and accessed there. The novel’s form is an asset for illustrating how and why this is necessary: its fidelity to the traditional print narrative (read page by page, from front to back) reminds us that readers read texts in succession,

no matter how often they switch back and forth between sections, apps, or time periods. The path of movement between texts—mapped in swipes and taps—is the story that readers create as they read on digital devices. Finally, I turn to "Black Box" to show how these narratives are read and put to use by the tech companies and other entities that create the conditions for those narratives in the first place. While digital readers have responded to the haptic demands and affordances of reading on mobile devices with the creativity that human touch allows, they have also found themselves conscripted into the development of data stories with implications far beyond the individual reader and their device.

1. Constructing Digital Touch

The haptic affordances of touchscreen reading technologies and the interpretive work of reading are intertwined. However, both analog reading and digital screen experiences have been conceived as touchless or disembodied, and fantasies of escape from physical reality have defined cultural discourses about both novels and digital culture. Reading, especially the reading of fiction, supposedly "transports" readers, provides a portal for "escapism," puts readers in someone else's shoes, and creates flights of experience beyond geographical limits. Recent scholarship reminds us, however, that touch must always anchor and structure these embodied behaviors, from eye strain to the anatomy of the page turn. Rather than simply supporting the visual and cognitive aspects of reading, these kinetic and haptic actions actually constitute reading in tandem with the visual, cognitive, and other sensory requirements of accessing a text. Literary critic Karin Littau points out that reading is not only an "occasion for interpretation" but also "an occasion for feeling" both affectively and tangibly with the skin, eyes, and muscles (3). Any act of reading will of course require the coordination of the body to facilitate that reading,

whether that means holding a book and turning its pages, or moving the eyes across a screen. In addition to these many familiar ways in which reading necessitates bodily engagement, reading often demands the participation of the entire body. Reading silently produces tiny movements of the larynx and tongue that correspond to the words being read.[11] These barely detectable motions, research suggests, are important to aiding reading comprehension and memory. Furthermore, the supposedly immaterial experiences that reading produces have their own material reactions. Reading about bodily action words, for example, activates the corresponding motor and conceptual areas of the brain (Hauk and Pulvermüller).[12]

Research like this confirms that reading is never merely a visual activity, though vision may seem central to interpreting printed or pixelated marks on a surface. But in fact, the haptic interactions between a reader and a text may not be so separate from the visual faculties that allow us to perceive words on a page. Anthropologist Tim Ingold, drawing from Maurice Merleau-Ponty's phenomenological philosophy, argues that the Western tradition of dividing the senses into five discrete categories belies how all human perceptual faculties work together as one to produce experience. Humans learn how to perceive the world "not by acquiring programmes or conceptual schemata for organising sensory data into higher-order representations, but by 'hands-on' training in everyday tasks whose successful fulfilment requires a practised ability to notice and to respond fluently to salient aspects of the environment," he writes (166-167). In other words, perception is not a process of knitting together different sensory channels, but a holistic encounter informed by all of the body's faculties.

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[11] See Daneman and Newson, Eiter and Inhoff, and Slowiaczek and Clifton.
[12] See also Mukamel et al. for discussions of the controversial mirror neuron theory, which suggests that specialized neurons activate for both observed and performed actions.

It is the whole of this holistic encounter that matters to reading's effectiveness and meaning-making procedures. In *Reading and the Body* (2015), Thomas Mc Laughlin writes that the motions of reading that "seem to be merely procedural processes are in fact an embodied set of precognitive activities that shape the interpretive work of reading . . . they implicate the reading body in social processes and disciplinary regimes" (21). Readers learn how to orient their bodies while reading, a process of socialization that also shapes their ability to read the content of a physical text. Mc Laughlin gives the examples of readers who may sit still at a desk, lounge on a sofa, balance a book on their knees, or lay on the floor to best approach the occasion or subject of reading. When a reader chooses to hold a book in a certain way, use their fingers to reverently or irreverently turn the pages, or run their hands along the spine, they are "processing the materiality of the text, creating precognitive architectures that affect and reflect the cognitive work of textual analysis" (Mc Laughlin 83). Touching reading is thus an interpretive act of its own, both as a mode of perceiving and as an act of manipulation (an act of the hands) that shapes the text physically and cognitively.

Haptic senses are tools of orientation that provide information about shape, size, distance, and other dimensional qualities. One avenue of scholarship around touch and reading views haptic engagement with the reading material as a method of geographical orientation. Ingold calls reading an act of "wayfaring," wherein readers must both literally and conceptually find a way through the text, such that "pages are inhabited landscapes with paths or trails through them" (Moores 203). Such an understanding of reading is similar to film theorist Laura Marks' concept of "haptic visuality," in which the qualities of a particular film may give viewers the experience of "touching" the film and being immersed in it (162). Rather than positioning the viewer as a detached observer, haptic visuality pulls the viewer into the experience and dissolves

the viewer-viewed relationship.[13] For reading, the entwined use of touch and sight together produce a feeling of being surrounded by the text, of understanding it in relation to the body, and of being able to move around inside of it. In a more empirical sense, research from Anne Mangen has repeatedly shown that in print media, readers use the physical cues of the object (book, newspaper, etc.) to create mental maps of the content as they use touch to anchor conceptual material to the physical boundaries of the text. Readers use the look and feel of pages to mark distance, to understand content in its relation to the whole, and to aid recall in the geographic space of the text (Mangen and Kuiken 164). This haptic engagement, Mangen has demonstrated, is essential to reading comprehension in print.

Mangen additionally argues that these haptic markers cannot exist in a digital text, because the digital text is not commensurate with the object of reading—it exists inside a multi-purpose device rather than having its own dedicated form. A scroll bar on the side of a displayed digital text is a visual clue to the relation of the part to the whole, but every "page" of a digital text exists in the same way with relation to the machine—the machine which provides the haptic experience of it. Likewise, every text encountered on a single digital device (and many of us access hundreds of these every day) feels exactly the same because the device does not change no matter what text is being read. Touching the screen cannot fundamentally manipulate or alter the shape of the digital device. Users can only hope, futilely, to summon new material from an object that itself never responds to manipulation. Therefore, "phenomenologically speaking and in terms of the underlying technical operations, user experiences online are temporally rather than spatially organized," in that online experiences cannot use spatial cues to orient the process,

[13] Similarly, John Berger writes that "to touch something is to situate oneself in relation to it" in the same space (8).

but rather only unfold in time (Wu et al. 5). Unlike interactions with analog objects that yield new haptic experiences corresponding to user input (turning the pages of a book changes the shape and heft of the book in the hands), moving through a digital text on a digital device produces no such tangible results. Instead, these actions all occur outside of the text, in the body of the reader, here functioning as an exterior part of the reading machine. In this sense, readers can never touch a digital text in the same way that they would touch a print one.

When reading on a smartphone, readers use a single device to access every text, so no individual text has a unique physical form. How can digital reading then produce the kinds of constitutive haptic experiences that are so essential in print reading? The specific haptic experiences of users of digital technology have only recently emerged as topics of study, partially because narratives of digital life have previously relied on fantasies of disembodiment. Indeed, digital technologies historically have been associated with disembodiment rather than materiality, and linked to fantasies of escape from mundane, bodily realities like disease, pain, boredom, and loneliness, as well as from social and political structures that exert power over bodies.[14] Utopian visions of the immaterial world of digital technology finds their counterpart in literary representations of digital technologies, as in William Gibson's Neuromancer, where the

[14] Fred Turner tracks the origins of cybercultural utopian communities and platforms like Stewart Brand's Whole Earth Network, which positioned emerging technologies, from graphing calculators to the early Internet, as tools for building more democratic and more communitarian worlds, free from the constraints of both legal systems and human bodies. In 1996, John Perry Barlow wrote "A Declaration of the Independence of Cyberspace" in response to the U.S. Telecommunications Act, which sought to limit pornography on the internet. Cyberspace, Barlow claimed, was a space apart from the physical world where laws are enacted: "Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are all based on matter, and there is no matter here. . . . Our identities have no bodies." As Barlow suggests, digital technologies seem to separate acts of cognition from the body that houses them, since virtual spaces encourage users to operate independently of their bodies in many venues (networked communication, remote financial transaction, virtual reality, etc.).

characters have access to "the bodiless exultation of cyberspace" where they escape the "meat" of physical bodies in favor of "disembodied consciousness" (6). Even in *Goon Squad*, where Egan displays a general unease with digital technologies, one character looks forward to the day when, aided by emergent networked technologies, "We'll rise up out of our bodies and find each other again in spirit form. We'll meet in that new place, all of us together" (203).

As N. Katherine Hayles and others have shown, however, experiences with the digital are instead extensively embodied. In Hayles' version of an optimistic digital future, the human is understood to encompass not only the delimited human body but also the ways in which patterns of human cognition and action extend through and beyond other objects, including intelligent machines.[15] More pointedly, Andrew Piper asserts that embodiment, and specifically touch, is at the center of digital technologies: nothing can be digital without reference to the human digits, fingers, that enable interactions with the objects of digital life (9). The field of Haptic Media Studies, pioneered by David Parisi, Mark Paterson, and Jason Edward Archer in a special issue of *New Media & Society*, aims to focus on the actions and experiences of human fingers (and bodies more generally) with the surfaces of digital media. The impetus for the issue arose out of their observation that the rapid development of new modes and capabilities for touching with digital technology has precipitated "a change in our orientation to tactility . . . the collective sensorium has been cumulatively altered through the technologies of touch" (1515). In other

[15] Moreover, the fantasy of digital disembodiment is only possible, Hayles claims, in a liberal humanist framework that dismisses or excludes bodily difference: "only because the body is not identified with the self is it possible to claim for the liberal subject its notorious universality, a claim that depends on erasing markers of bodily difference" (4-5). Reclaiming the materiality of digital space, then, is a matter of re-centering the body in human life. And, of course, digital experiences are not free from the influence of non-digital materialities like race, gender, or geographic location. See also the work of Simone Brown, Ruha Benjamin, and Wendy Hui Kyong Chun.

words, the technologies that deliver new media experiences do so through forms of touch that themselves shape what touch is and can be. A central pillar of the HMS issue is exploration of "the historical precedents of our haptic moment, recognizing that touch has existed as a contested object throughout its genesis" (1516). If the forms of touch have been changing under the direction of tech development and alongside the social transformations attendant to new media technology, and if, as theorists of reading have demonstrated, touch is central to how readers read, then how readers haptically engage with their digital reading technologies is important at once to their individual reading experiences and to the social function of reading with digital technology.

Though the haptic interfaces between users and digital technologies are both diverse and unique, the meaning of "touch," especially in relation to touchscreens, has come to have a circumscribed meaning. In fact, "The effect of the worldwide profusion of touchscreens is to correspondingly undervalue, and underestimate, the complexity of our everyday haptic interactions with them" (Parisi, Paterson, and Archer 1515).[16] As Parisi explains in *Archaeologies of Touch* (2018), this limited sense of touch was engineered alongside the devices in which it was enacted. Parisi argues that marketing for touchscreen technologies redefined technological touch to mean only the one-way touch of fingertip to glass screen. The degree of haptic engagement with these objects is limited, because their contours and intrusion into physical life are deliberately constrained. Parisi notes the 2004 "Touching is Good" advertising campaign from Nintendo for their new Nintendo DS gaming device, which featured a touch

[16] In the context of widespread mobile digital technologies, Zara Dinnen refers to the ever-disappearing experience of digital novelty—our awareness of its newness, its uniqueness, its separation from other parts of life—as the digital banal, the condition in which users of digital technology cannot feel the affective dimensions of "becoming-with" technology.

screen for the first time. This campaign, in addition to others in the early 2000s, like Apple's "Touching is Believing" campaign for the first iPhone and iPod Touch, featured fingers reaching out to touch screens, prominently staging the relationship between hand, device, and the digital content delivered through these platforms. Recall, for example, the giant hands that accompanied the first images of the iPhone in Jobs' keynote speech. Parisi argues that these early images of touchscreens established the protocols for engagement with later iterations of digital touchscreen devices, with the meteoric rise of the iPhone and other smartphones and tablets. These early advertisements, Parisi argues, were about "the construction of what qualifies—and fails to qualify—as technologized touch" (270). Through their efforts, "touch interface and haptics technology were made legible to their prospective audiences" for the first time (270). At the same time that the finger and screen images produced screens as "object[s] of tactile knowledge," they also "reduced the whole of the tactile system to the single point of contact between finger and screen," such that "the nimble index finger embodied the essential totality of touch" (280, 275). The result was a reduced version of touching, one in which the touching body manipulates the content behind the glass, but is protected by the smoothness of the screen, and can interact with digital content "without fear of sensation" (279). The experience of scrolling, swiping, and tapping on a touchscreen is thus an experience of touching, but not an experience of feeling. The body that feels is eliminated, and interacting with digital content is reduced to a one-way relationship between a fingertip and glass. Users can use this limited form of touch to interact with the device, but cannot "feel" (in the sense of meaningful haptic feedback) the thing that they touch. As a result, the texture and heft of digital texts go unfelt behind the slippery glass while users are told that they can and are touching the digital.

When the constrained touch of taps and glides is the only option available to users of digital reading technologies, the digital content behind the glass becomes difficult to touch—its surface is slippery and hard to grasp. Digital haptic qualities are reliant on this constrained and limited form of touch. The haptic interaction that a user produces with the device therefore fails to "reach" the content within—an angry tap produces the same response as a gentle one. While the user taps on the screen, the digital text they are interacting with continually slips away from their haptic grasp. Likewise, in their explanation of Reality-Based Interaction interfaces—digital interfaces that mimic real-life physics (drag and drop capabilities, pinch to zoom, swiping etc.) Ingrid Richardson and Larissa Hjorth identify the gap between the expectation of control (based on a user's innate familiarity with physics in daily life) and the capabilities afforded by the digital interface. While the device's interface promises to respond with lifelike accuracy, the behaviors that are actually available are severely limited. You can drag and drop an icon, but you can't bend, caress, turn, or tear it. In her study of buttons, Rachel Plotnick argues that touchscreen buttons are not buttons at all, because they do not protrude and do not depress, and therefore cannot register the analog variations in user input (1634). She uncovers how older technologies of the button such as the typewriter used "marketing strategies [that] associated tactile behaviors with the very core of one's personhood, portraying touch—and variable application of force or pressure—as an act of intimacy with one's machine" (1641). On the contrary, all input to touchscreen buttons is the same, with individual variation in force or style of touch making no difference whatsoever to the device.[17] Users literally cannot "grasp" digital

[17] Features like haptic force feedback (the tiny vibrations that sometimes accompany taps on a touchscreen) and force-sensitive touchscreens only partially remedy this problem, expanding technologized touch to include a limited set of other options without providing access to a larger sensorium of haptic experience.

content in a satisfactory way, but rather must make do with a "a temporary and incomplete simulation of real-world physics" (1661).

Côme Martin argues that "one doesn't navigate *through* but *on* a digital work: in contrast with print content, which one can touch, digital content remains protected behind a screen whose surface can only be brushed" (Martin 13). In this conception, a digital document is always inaccessible, sequestered behind a smooth, two-dimensional glass. Between 2011–2013, the shift to "flat design" in consumer technologies codified this version of digital haptics. Within this brief period, Apple, Google, and Microsoft led the shift away from a skeuomorphic principle of design (in which digital icons and objects resemble the three-dimensional objects that they metaphorically represent) and towards a "flat" aesthetic in which digital icons and interfaces use two dimensional, solid-color shapes to communicate form (Graphéine). In tandem with the limited forms of physical engagement, this shift away from depicting lifelike objects indicates how digital content remains something to be tapped rather than grasped or manipulated.

Figure 3 Skeuomorphic vs. flat design in iOS (Graphéine).

2. Slippery Reading

The difficulty of digital text(ing) is thus built into our touchscreen protocols. As a further example, the "Sent from my iPhone" email signature serves as both a not-so-subtle status marker, and also an implicit apology for typos, brevity, and clumsy fingers on a small, smooth screen. A 2012 study showed that email recipients were more likely to forgive grammatical errors in emails from senders who included this message (Carr and Stefaniak 417). The difficulty of interacting with the iPhone as a physical object with its own specific forms of haptic feedback

produces the difficulties of interpreting text on another digital device, which includes its own haptic demands as well. As media theorist Mika Elo points out, the metaphorical use of "grasp" to mean "fully understand" indicates how important touch is to the concept of interpretation and understanding (2). The limited forms of haptic engagement available to touchscreen readers that produce slippery surfaces are thus causally connected to the "slippery" nature of digital texts, which are hard to grasp in multiple senses of the word.

This slipperiness is a core feature of natively digital genres and forms, as in Egan's Twitter story, "Black Box," where the status of the text shifts owing to its release on the social media platform. "Black Box" was published first as a series of tweets on the @NYerFiction Twitter account in May–June 2012 and then in print and online in the *New Yorker* magazine. Though the protagonist is unnamed, it becomes clear through references to other characters and events that the unnamed protagonist of "Black Box" is a character from Goon Squad: Lulu, several years after the last chapter of the novel.[18] Lulu appears here as a volunteer undercover agent doing a mission in the Mediterranean. Aided by numerous technological implants and enhancements, Lulu integrates herself into her target's social life as a "beauty," gathers information on him and his plans, and must make a sudden escape when she is discovered and injured. The text of the story takes the form of short missives from the field, Lulu's transmitted thoughts formatted as advice to future recruits.

I will discuss the thematic content of the story later in this chapter, but for now would like to take a moment to read the text's hybrid digital-print format in order to illustrate how slippery digital texts can be from their position within a glass rectangle. Now, readers can find "Black Box" collated in magazine article form on the New Yorker's web archive, or in print. But

[18] Egan also refers to the character as Lulu in interviews ("This is all artificial").

the first readers of "Black Box" encountered the text on Twitter, through the smooth, glass screen of a digital reading device. As a Twitter text, "Black Box" mirrors the forms of reading that are familiar to users of digital devices and makes clear the effects that the "black box" of the reading device have on reading texts. In its original form as a temporally-delimited, Twitter reading event, "Black Box" illustrates the particular temporal qualities of online texts that manifest as specific haptic demands. For the duration of its ten-night run, "Black Box" appeared one tweet at a time for one hour each evening. Like previous serialized fiction and narratives, these staggered releases limited readerly control over the temporal unfolding of the text. In many interactions with the texts that digital devices provide access to, readers have little control over when new texts may appear. The device releases new material seemingly on its own inscrutable schedule.

In this sense "Black Box" actually fails to capture the sporadic, tantalizing nature of digital temporalities, which are less predictable than the nightly "Black Box" updates. "@I_Bombadil" (2015), a Twitter story by British author David Mitchell, may illustrate this phenomenon more accurately. For several months in fall 2015, the fake @I_Bombadil Twitter account documented a first-person narrative of reading: Bombadil finds records, archives, clues, etc., related to Mitchell's novel *Slade House* (2015). Bombadil posted tweets in "real time," as if he were a real person using Twitter to document his adventures. Followers, near one thousand at the end of the several-month performance, interacted with Bombadil's tweets as if he were real, and David Mitchell sometimes piped in as himself from his own Twitter account. Just as Bombadil's story advanced without predictable rhythm, and as a combination of "Bombadil," Mitchell, and the participating readers, the social media platforms that readers access through their phones and laptops are made up of texts from multiple sources that arrive on schedules that do not track to any established rhythm. The suspense generated from these inconsistent updates

produced, “an immersive real-time experience where readers get the sense that they partake in Bombadil’s ongoing adventures without knowing the outcome in advance” (Andersen and Linkis 90). The suspense of waiting, and checking Twitter, was part of the game.

One effect of these conditions is that the experience of each digital text is not a discrete one, but rather crammed into the device with other texts, many of which the reader will encounter in between the updates, or even, in the case of long-form, non-serialized narratives, as interruptions into the reading. Because, as above, the frenzied motions of the hands and body do not produce any demonstrable difference in the experience of touching/feeling a text, these texts—like the body of the reader and the device—begin to blur together. On Twitter’s main interface, “Black Box” and other Twitter fictions are intertwined with other tweets from other accounts. “Black Box” models this confusion of texts to be read in its narrative style. The multiple voices that seem to be present within Lulu’s dispatches, from her own intimate feelings about being coerced into sex, to the disembodied voice of the government that she represents (“We can’t tell you…We can only reassure you” [par. 43]) also hint at this interchangeability as each appears, equally, as a tweet on the same device, but hints at the presence of different perspectives, motivations, and positions than are not detectable/tangible within the reading experience. As Tore Rye Andersen points out, “The rhetorical register of the story spans from poetry and jokes to philosophical observations and neutral descriptions, and most of the pieces in this stylistic mosaic manage to have their own payoff in accordance with the logic of the Twitter format, even while they contribute in various ways to the unfolding story of Lulu’s adventures” (39). Andersen notes that the tweets that received the most individual interactions were those that could stand on their own as aphorisms, jokes, or nuggets of internet wisdom. These texts are understood as detachable from the whole, versatile enough to mix with whatever other genres of

tweet adorn a user's feed. The difficulty of retrieving the entirety of the original "Black Box" also reinforces its status as composed of individual, stand-alone texts that may or may not be assembled into a recognizable literary object versus other texts on the same platform and in the same device. While you can search @nyerfiction for the time period in which the "Black Box" appeared, some parts of the story are mysteriously missing, and others are interspersed with tweets from the account that were released outside of the one-hour nightly "Black Box" appearances. Reading on a networked, touchscreen device means reading multiple texts in quick succession, overlapping and interrupting one another. These texts by necessity must bleed into one another, partially because of the singular, smooth device that contains them all, frustrating a reader's ability to haptically gauge the geography of the text.

Teju Cole's 2014 Twitter short story, "Hafiz" perhaps even more clearly illustrates this blurring effect. Cole wrote the entirety of "Hafiz" in advance, but then distributed the story in pieces to friends and Twitter followers who volunteered to post one 140-character snippet each. Cole then retweeted these tweets in chronological order on his own account to produce the comprehensive text of the story. As a result, one reader notes, encountering the tweets individually produces a strange dislocation, an encounter with literature that remains unannounced as such. Twitter readers who read any of the individual tweets from users they follow might never recognize that tweet as part of a larger story, but "if one of those sentences happened to sink its hooks into you, as Delaney's did to me, it led you to a collective whole, an island of context in Twitter's vast chaotic sea" (Vecsey). Just as the reading brain must cobble together meaning from marks that may or may not be recognized as letters and words, so Egan's, Mitchell's, and Cole's Twitter works ask users to distinguish their writing from other kinds of writing—or not. In fact, on Twitter, who is to say what is not part of "Black Box"? Is this tweet,

released part-way through the "Black Box" run—written in the same if/then, second-person perspective as the rest of "Black Box"—part of the story?: "If you're just tuning in, you can also read this installment of Jennifer Egan's "Black Box," in its entirety here: http://nyr.kr/KeO4Uf" (@nyerfiction). Arguably, yes. Or perhaps not. But the device itself yields few clues. Perhaps the ordinary experience of Twitter or digital and online reading more generally is an experience of being addressed, apostrophized, conscripted into a grand narrative in which readers may or may not recognize themselves as playing a part. Once again, the experience of reading on a digital device, the smooth, impenetrable surface of which provides no feedback as to the individual nature of the texts encountered within, obfuscates the status of the texts read and the bodies of the readers and devices involved.

3. Reading Digital Time

"Black Box" leans in to the formal ramifications of digital textuality and digital haptics, sitting uneasily between the poles of digital and print culture. In *Goon Squad*, Egan stages a more thematic confrontation between analog and digital modes of reading that highlights the textures of both. The novel is a hodgepodge of textual forms and genres, from third-person narration, newspaper articles, footnotes, first-person accounts, song lyrics, and academic texts, to PowerPoint slides, text messages, emails and poetry. Though most of the novel takes place in the latter half of the twentieth century, the final two chapters flash forward into speculative futures where digital texts are the norm: characters read and write using PowerPoint, or—a few years later and more pointedly—using "handsets" that are Egan's version of smartphones. Their communications and most intimate thoughts are sent as text messages on these mobile devices. The trajectory of the novel therefore leads up to and is retrospectively structured by the

appearance of these digital, touchscreen technologies that cast all previous textual experimentation within the context of emergent digital media. The forms and genres represented throughout the novel are thus each transitional texts that point to the growing presence of digital forms and aesthetics. As in "Black Box," the narrative and thematic exploration of digital reading in *Goon Squad* thematically and formally links digital textuality to *time*, in that both digital text and time are slippery, moving targets that must be grasped in order to be understood.

Concurrent with the transition to the digital in the novel is an increasing concern, and even anxiety, about the physical experiences that accompany analog and digital technologies. Egan herself is notorious for her technological skepticism and digital amateurism: she writes her novels by hand and did not know how to use PowerPoint prior to writing *Goon Squad'*s chapter that uses the medium ("This Is All Artificial").[19] And so on one hand, the novel espouses luddite fears about the losses that digital technology might produce. During Google's Authors@Google series, Egan discussed her simultaneous fear and fascination with technology, both personally ("Oh my god, maybe I won't know how to use it" [8:10]) and on a larger scale ("There's always the fear that somehow it will make the world worse" [8:15]). On the other hand, as Egan conveyed in the same Google forum, the novel seems intrigued by "new forms and genres that become possible through technology," and how they might reinvigorate the novel, which has always been "a very flexible, elastic, open form" (11:10, 11:17).

Despite this ambivalence, on the surface, *Goon Squad* seems to reflect Egan's earlier skepticism toward new media technologies, in part advancing a popular narrative of digitization

[19] All this despite the fact that Egan dated Steve Jobs while she was a student at the University of Pennsylvania, during which time he installed an early Macintosh computer in her dorm room (Schuessler).

that is misleading about the haptic and cultural dimensions of digital reading and communication. Digital content in the novel, as in "Black Box," is slippery. The novel's most infamous chapter is the 76-page PowerPoint presentation, "Great Rock and Roll Pauses," an experiment in displaying a digital text (the slide) in print (the page). Coming about two-thirds of the way through the novel, the PowerPoint is an interruption of an otherwise familiar, if generically and formally varied, literary and print form. The slides' author is Alison Blake, the young daughter of another major character, Sasha. We do not know what kind of device Alison uses to produce or view the PowerPoint—perhaps a desktop computer, perhaps a tablet of some kind. In their liminal state, the slides are an interaction, regardless, with smooth surface over which the eyes and hands "slide." For Alison's mother Sasha, the surfaces produce confusion about the status of the text. She urges Alison to "try writing for a change," specifically "writing a paper," a suggestion that Alison meets with disgust (253). Sasha, however, simply cannot understand the digital text of the slide: "I see a lot of white. Where does the writing come in?" (253). She doesn't know where the digital text is. In contrast, Sasha's preferred method of storytelling relies on a definitively tangible process. She collects "found objects," mostly "little papers" like shopping lists, notes, receipts, and reminders, "glues them onto boards and shellacs them" into place as a collage (265). Unlike the shifting, sliding digital text, these print objects can be grabbed by the "handful," and then affixed to a tangible surface, forever and ever, so that "they tell the whole story" (264). Sasha has no trouble understanding how bits and pieces of text, arranged in strange patterns on a rectangular surface, can come together to tell a story. Her understanding fails, however, when print turns to digital aesthetics, where the contours are less clear. The slides slide because it is in their nature as digital texts accessed through a digital

device to do so. Sasha finds the situation unsettling, as do many characters in the novel, specifically through the comparison to print or more tangible objects.

Goon Squad repeatedly returns to this tension between the text that can be grasped, and the text that cannot because it resides behind the "surface that can only be brushed" (Martin 13). Media and literary critic James Hodge explains that digital text now is "animated:" mostly produced and read by nonhuman agents that manipulate it behind the scenes (81). One user's visit to their Twitter feed, for example, relies on Twitter's "Highlights" algorithm to choose and order the individual tweets that appear on the screen. New tweets published by other humans or by nonhuman agents may cause this feed to update in real time, without the reader's consent. The trending hashtags, advertisements, and other automatically generated components scattered around the interface are called up and changed by invisible calculations within the page's source code. Refreshing or reloading the feed may result in a new view entirely, so that it may be impossible to ever regenerate the same text again. Hodge asks, "When the text moves on its own through varying states of legibility, however, what does it mean to call the act of sitting in front of my laptop 'reading'? . . . What if we can't get hold of the text? Everything hinges on the animation of the text in its expression of the possible entrainment of human experience with the time of computational processes" (81). Whatever the human experience of time of digital reading, the "time of computational processes" continues at its own, often breakneck, pace. Human readers cannot control how digital text emerges, disappears, is edited, reproduced, and therefore cannot "get hold" of it. In this way digital text is like time: it moves on without you.

In Egan's work, time and digital text come together most clearly in the "hum" that many *Goon Squad* characters can hear when they listen closely. The hum is both time itself, passing all the time without notice, and the drone of technologies, especially in the outdoor concert in "Pure

Language." As Alex approaches the concert site with his family, he becomes aware of "a sound just out of earshot, the vibration of an old disturbance. Now it seemed more insistent than ever: a low, deep thrum that felt primally familiar, as if it had been whirring inside all the sounds that Alex had made and collected over the years: their hidden pulse" (331). It is the same sound that Sasha hears in the first chapter, marking time with "the faint hum that was always there when she listened" (18). This soundless hum is both time, as the characters repeatedly note, but also, for Alex, the sound of helicopters and "visual scanning devices affixed to cornices, lampposts, and trees:" a technological sound (331). Alison and her family hear the same sound out in the desert: as they walk, "Suddenly There's A Whirring Noise Around Us" as "Thousands of solar panels lift and tilt at the same time, in the same way" (293). As she walks back towards their dark house, Alison fears that "the solar panels were a time machine," and that her old way of life is gone, even though "it felt like it would never end" (299). *Goon Squad* links together the passage of time and the always-on vibrations of technology through the hum that reappears throughout the text—that in fact hums along on each page.

The hum's constant presence demands constant attention, just as digital network devices do. On an individual level, the hum of time and technology is replicated by the "constant chatter of handset beeps and burps" that accompany all of the characters in the final chapter (317). Hodge calls notifications like these the "soft, insistent demands" of digital network devices (*TOUCH* 3:09). Using smartphones results in a "Mild low-level libidinal hum that courses through our days," Hodge says, a bodily orientation towards potential notifications that produce a constant state of anxiety for users of these devices (2:50). This is because, as media theorist James Gilmore explains, always-on computing transforms every moment into a moment of attention to the device, which needs to be tended and cared for. In terms of what is actually

encountered on the device, these constant moments of attention are also moments of reading: notifications are texts to be read and acted upon. All moments are potential moments of reading. The haptic feedback of such devices—their soft, insistent demands—are designed to "direct the body toward not only the device but also a subsequent response to the information displayed (Gilmore 192). Gilmore sees these directions as part of the "disciplinary capacities of this ongoing touch" which "inform a body that must always be aware of, if not able to respond to, the information pushed to the body" (198). Mc Laughlin, likewise, argues that reading behaviors are disciplined behaviors: readers learn how to position themselves appropriately to complete certain reading tasks in certain contexts. "Wherever there is print literacy," he explains, "there is a pedagogy of physical stillness—how to adopt and sustain a stable stance that brings the eyes and the text into effective range for whatever time the text demands" (79). The characteristics of the printed page require certain orientations of the body—the same is also true for the digital text that is expressed through an always-on, needy device. Like the goon of time in Egan's novel, the insistent demands of always-on computing push around the body as they push notifications through buzzing, beeping devices. What then are the postures and motions that digital readers must conform to in order to keep up with the haptic demands of digital texts?

Digital reading requires a commitment to repetitive motion over time, to the "mundane frictions" of interaction with touchscreens that tend to the device's needs (Fors 1). The needs of the digital text become our needs, too, through the logic of tech development that insists that there is always more to be read. On an endless feed like Twitter's or Facebook's, one more refresh, one more swipe or scroll might produce something truly worth reading. For this reason, the feelings generated by these conditions have been compared to the logic of gambling.[20]

[20] In *Addiction by Design: Machine Gambling in Las Vegas* (2012), Natasha Schüll analyzes the

Tristan Harris, who long worked as Google's "Design Ethicist," warns that companies like Apple and Google have a moral imperative to transform their design practices now that "several billion people have a slot machine their pocket."[21]

As with slot machines, however, interactions with digital reading technologies produce not only psychological effects, but also embodied or haptic ones. Haptic touchscreen interactions ("pull down to refresh," scrolling continuously with the thumb, swiping left or right) are part of the experience of reading on a digital device through which readers access the texts that make up social media, email, and other communications tools. Each pull, scroll, or swipe puts the hand in contact with the screen in hopes of producing a change in the data displayed there. These behaviors are not entirely voluntary, but responses to a demanding, habit-forming medium. In *Goon Squad*'s final chapter, Alex finds his handset "vibrating . . . almost constantly" and worries that his daughter can "feel the vibrations through his body" (Egan 322). This haptic sensation produces a rabid need in Cara-Ann: she demands to be allowed to hold it again despite Alex's efforts to conceal the device. But Alex's feeling is similar: as soon as his hands are free, he

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causes and effects of slot machine addiction. As one gambler reports, "I'm almost hypnotized into being that machine. It's like playing against yourself: You are the machine; the machine is you" (Schüll 173). The logic of the slot machine draws in the body to the machine. Like the anticipatory temporality of variable rewards on digital platforms, it demands mental and physical attention. Schüll's work catalyzed an interest in gambling-like addiction from Silicon Valley designers and developers. Nir Eyal's influential *Hooked: How to Build Habit-Forming Products* (2014) drew extensively from Schüll's work and casts her disturbing findings as a how-to guide for tech designers. It became a bestseller in Silicon Valley and has influenced development strategy in companies large and small.

[21] Harris also claims that "No one profits when millions check their email and nothing's there. Neither did Apple and Google's designers want phones to work like slot machines. It emerged by accident." I find this unlikely. As the very existence of Eyal's book suggests, addiction is the goal, and very profitable. Media theorist Scott C. Richmond argues that the "vulgar boredom" of interacting with digital media is a surrender to capital: "They are frankly and explicitly the expropriation of our attention, monetizing even those small moments of boredom where I might be released from desire. Capitalism ruins everything" (35).

"swiftly check[s] his handset" for updates that bring on "an alloy of emotions" (324). Hodge refers to the "twin dynamic of anxiety and pleasure" that smartphones engender, both demanding and rewarding attention through touch (*TOUCH* 3:08). These small motions of the hands—taps, scrolls, swipes—are, as Hodge suggests, required to relieve the tension that radiates from the device. We sense that there is always something we might be missing, and so we just keep reading, keep touching, to keep up with the digital text. [22]

4. Building Haptic Narratives

In response to these demands on attention and bodies, digital readers must constantly "adjust" digital texts as they change over time and behind the screen by touching the device itself. I argue here that these adjustments are not only reflexive responses to the overwhelming conditions of digital reading, but also play a pivotal role in the interpretive reading processes of digital readers. Touching digital reading is an attempt at creating a narrative where one might not otherwise exist, and of reclaiming digital time such that it coheres into a manageable flow. The slight motions of tapping, scrolling, and swiping are what allow individual readers to order the multiple, slippery texts that flicker through a touchscreen device at speeds and paces that they cannot keep up with. Mc Laughlin points out that all reading motions (in print and digitally) are skilled responses to the technologies and environments of reading. Each reader adopts the reading postures and motions that work most effectively for them; these movements "are often efficient, improvised solutions to the physical challenges of reading. And like all improvisations, they are generated by unique individuals who operate out of a tacit understanding of their own

[22] While anxiety and pleasure are both present in interactions with digital devices, these emotional demands remain "soft" or minimal, and might also be expressed through Richmond's "vulgar boredom" or even Sianne Ngai's "stuplimity" (Richmond 32, Ngai 36).

capabilities and challenges" (83). While these behaviors are solicited by the device itself, and arise from the demands of monetized digital content, they are also part of reader's strategies for understanding digital texts.

Goon Squad's depiction of digital reading technologies centers haptic experiences of human readers as they rely on their devices to communicate, though the novel often reflects Egan's distrust of the rapidly emerging digital world. The last chapter, "Pure Language," which features the handsets that stand in for smartphones in the novel, is particularly attentive to hands and the way that they facilitate interaction with digital text—and are or are not able to grasp it. The aforementioned handsets are the central conceit of the final chapter, and the characters' abilities to touch and hold these objects feature prominently in the chapter's language. Excluding references to the *hand*sets, descriptions of hands and fingers appear more than forty times in "Pure Language."

Most directly, there are the "pointers:" the babies and toddlers who have become a target market demographic for digital content because they have mastered the one skill necessary for interacting with that content: using their fingers to manipulate a touchscreen (313). "Any child who could point" is fair game for content producers, even though these children are often "preverbal" (313). The chapter's protagonist, Alex, and his wife, Rebecca, are worried about the effect so much screen time will have on their pointer-age daughter, and so "Cara Ann ha[s] never touched one" (313). Nevertheless, at her first opportunity to interact with a touchscreen, Cara-Ann unleashes "the blender whir of [her] pointing fingers" on the device, "pound[ing] keys with the hectic fervor of a starving dog" to manipulate the screen with expertise, "as if she'd been doing this since birth" (322). In this digitally-saturated future, Cara-Ann has passively absorbed the necessary skills that allows her to expertly navigate the touchscreen with her fingers.

Merleau-Ponty writes about "knowledge in the hands:" a practical knowledge that is "bred of familiarity ... which is forthcoming only when bodily effort is made" (166). Essential to Merleau-Ponty's concept is the idea that "knowledge in the hands" is inaccessible to conscious effort—it is located in the hands and nowhere else. It is therefore an expression of knowledge that is produced in tandem with an object. *Goon Squad* focuses on these hand-based interactions as a knowledge that exists in the hands and which facilitates an essential way of interacting with the object.

The emphasis on pointing fingers does not end with these non-readers. Rather, the chapter charts the centrality of hands to the adult handset users who manipulate these devices to communicate with one another via text. Alex and the other characters "jostle," "type," "squeez[e]," "clutch," "hold," smash," "touch," "reach," and "fiddl[e]" as they negotiate between digital and nondigital objects (Egan 321, 330, 331, 334, 336, 337, 340). They grab each other's hands in expressions of affection, anxiety, and anger. Hands appear in metaphorical roles too: Bennie loves Scotty's music because the reclusive musician is "untouched" by popular culture (313). Alex panics about leaving his meeting with Bennie "empty-handed" (314). Marketing is all about "reach," not content (312). The chapter's anxieties might be summed up in the following questions: what can you grab hold of? Who can you touch?

Through repeatedly touching on hands and how they labor to control the device, this chapter suggests that as much as these behaviors are solicited by anxiety about the device, they are also productive for the user. At multiple points in the chapter, Egan refers to characters using their touchscreen device as "working" the handset, as when Bennie keeps "frenetically working his handset" at Scotty's concert (336). I find "work" evocative here. It is a way of conceiving the hands' relationship to the device as one of productive effort. Despite the fact that the touchscreen

is a "surface that can only be brushed," that its buttons do not depress, and that forceful action makes no difference to the glass, the tapping and scrolling of fingers on screen *are* work, and they have effects on the relationship to the device. Eli Pariser tracks the transformation of media in the early digital era from "push" to "pull" models, in which the flow of an audience's movement through content is no longer pushed to them by content producers (as in television programming), but rather pulled from among possible options by the audience itself. Early on, pull models were lauded as returning agency to audiences who had become subject to the whims of broadcast producers. The problem is "that pull is actually a lot of work," Pariser writes, "It requires you to be constantly on your feet, curating your own media experience" (40). The work that digital readers do is part of this demand to curate from among the millions of possible texts and behaviors that digital network devices make available. The work of manipulating a touchscreen, as Mc Laughlin might put it, is a skilled response to the demands and affordances of digital texts.

This skilled work is essential to the textual behaviors of digital readers. When readers brush at the surface of their screen, opening up texts, switching between them, returning to old tabs, sending links to one another, they are charting a narrative geography that adheres neither to the physical contours of the device itself, nor to the narrative arc of a single text, but to the individual path of reading that a reader creates through their taps and swipes. The "mundane frictions" of these behaviors, as media anthropologist Vaike Fors argues, "plays a role in the process of everyday sensory emplacement in contemporary media practices" (10-11). The minimal haptic experiences of touchscreens, that is, help users become sensorially embedded within the content they access. I additionally suggest that users/readers are not only *em*placed

into media, but also are engaging in physical acts of *placement*: they move the texts around in order to place them in order, thereby creating a narrative arc that is unique to their reading session. Hands craft narratives out of the non-narrative flow of digital texts that those hands read—they are tools for grasping that which cannot be grasped in the time of digital reading.

By narrative, I mean a particular representational form that has a distinct relationship to time. Perhaps the most generous definition of narrative comes from H. Porter Abbott: "a narrative is the representation of an event or a series of events" (12). In this sense, narrative is capacious, can encompass anything (and, as Abbott argues, is omnipresent in human experience), but Abbott's point here makes a distinction between non-narrative events that are not yet linked together through description, and the secondary collation of those events into a representational form. Narrative is what binds events together in causal or other relational links that do not otherwise exist. Abbott describes narrative as the primary method that humans use to organize time, as forging a connection between moments divides time into meaningful arcs (3). Following literary critic Frank Kermode, narratives thus produce an expectation of closure, or at least an ending, as events are curated into a discrete set in the attempt to divide time into units of beginning, middle, and end. While this is increasingly difficult in a complex world, Kermode maintains that "in 'making sense' of the world we still feel a need . . . to experience that concordance of beginning, middle, and end which is the essence of our explanatory fictions" (35). Likewise, Paul Ricoeur writes that "Time becomes human time to the extent that it is organized after the manner of a narrative" (3). For these theorists, narrative is a tool for understanding time, and making it play by human rules. Digital readers encounter a dizzying variety of non-narrative texts that slip around behind the glass of their screen in the rush of digital time. I argue here that the work of their reading hands is to curate these non-narrative

moments into the manageable form of a narrative, to control those texts and the digital time they exist within.

Digital narratives, however, are a contested form. In his seminal *The Language of New Media* (2002), Lev Manovich established the database (the form of digital information) and narrative (the form of analog media) as "natural enemies," with the database overtaking narrative as a dominant form with the introduction of digital technologies (228). In the age of new media, databases are the substance out of which narratives are made, Manovich says (227). He is careful to note, however, that narratives do not arise out of non-narrative texts (i.e., databases) simply through the act of reading them in a particular order: "if the user simply access different elements, one after another, in a usually random order, there is no reason to assume that these elements will form a narrative at all" (228). This is a reasonable statement. But what *Goon Squad* and haptic media studies reveal is that readers nevertheless desire to narrativize their media experience, and they attempt to do so by grasping at the slippery texts and surfaces of their reading devices. Their efforts, then, become narratives by force. Moreover, as both Hayles and narrative theorist Abbott point out, narrative is fundamental to human experience. As a form, it is ubiquitous in the way that humans speak to one another, rationalize events, objects, and images, and understand information. Because narrative is so fundamental, Hayles revises Manovich's gloomy pronouncement to clarify that databases and narratives are symbiotic forms that complement one another in the presentation of information, digital and otherwise *(How We Think* 171). Where databases are expansive and inclusive, narrative is selective and discerning. Narrative is a way of organizing digital soup into human time and wresting meaning from the meandering path of digital reading.

In *Goon Squad*, the characters sense that something like this narrative control is necessary for capturing both the information and time that tries to slip past them. Scotty spends hours watching television each night, but switches between channels rapidly, and as a result "couldn't identify" most of the shows that pass his screen (Egan 96). Instead, he explains, "You might say I created my own show out of all those other shows, which I suspected was actually better than the shows themselves" (96). Scotty's impulse to narrativize the gamut of media he experiences is a necessary response to the overwhelming amount of information he consumes. He thinks of humans as "*information processing machines*, reading X's and O's and translating that information [into] 'experience,'" (96). He has "not only the information but the artistry to *shape* that information using the computer inside my brain" (96-97). Scotty's acts of "reading" the "X's and O's" that make up these disparate media relies on the "artistry" of a brain that exists in relation to computational technologies. His comment forges a relationship between himself, his brain, the text of life, and the computer where the end result is a story, a narrative.

Where the sequence of texts encountered in a session of digital reading does not have a narrative time—as diverse texts linked in no particular causal or other relational order—narrative becomes a way of linking them together. Accordingly, in *Goon Squad*, Alex uses his handset to create narratives in the final chapter that help him to make sense of "what happened to [him]" over the years (339). Alex and Lulu collaborate to lead a blind team of "parrots" who will create marketing buzz around Scotty's concert. His text conversations with Lulu "could meander for indefinitely, and in the pauses Alex monitored his blind parrots: checking their pages and streams" (Egan 327). In the "indefinite" time of digital reading—a behavior that involves text messages, social media, and websites—Alex uses his handset to organize a narrative of his success through the concatenation of his relationship with Lulu and his perusal of the fifty online

presences of his friends. Through these efforts he "places" Lulu, now "a person who lived in his pocket, whom he'd ascribed her own special vibration" (327). Lulu has her own haptic signature, one that both prompts Alex to respond and that enables him to order his experience. Whereas for Alex the time of these behaviors is "indefinite," his narrative appears to readers of the novel in the form of a linear narrative. The result is a discrete, meaningful representation of events that makes sense of the slippery motions of time and digital text.

The relationship between digital reading and time means that efforts to control time are also efforts to control narrative. In an attempt to cure her habit of stealing from others, Sasha sees a therapist, Coz, with whom she is, in her mind, "writing a story whose end had already been determined: she would get well" (Egan 6). Sasha's desire to write a story that has a predetermined ending is a desire for reassurance that her actions now are part of a narrative arc that promises closure. This is what may be missing from digital reading. The endless scroll (or the indeterminate meander of Alex and Lulu's conversation), which by definition can have no narrative resolution, produces entwined anxiety and pleasure: anxiety to keep reading, and pleasure when that reading can coalesce into something worthwhile. Sasha embodies the determination digital reading requires, as well as the strain on the body. By tensing her body and waiting, Sasha feels that she is "claiming the couch, her spot in this room, her view of the windows and the walls, the faint hum that was always there when she listened" (18). Her control over her body translates into control of time, until the moments line up neatly for her "another, then another, then one more" (18). Sasha may be successful: she appears throughout the story, from the first to the last page, structuring the entire novel through her presence and relationship to the "hum" of time. Perhaps it is worth noting that Sasha's problem is that she has "sticky fingers:" she steals, but she also creates narratives out of the piles of objects she steals, the

papers that she sticks together as collages, the "trash" she combines to make sculptures (338, 242). Sasha's sticky fingers, we might say, allow her to grasp what can't be touched.

Sasha's narrativizing impulse is almost universal. *Goon Squad's* characters want to take the disorientation of time, which is also a disorientation of accelerating technological development, and make it into a story. This is of course what *Goon Squad* does formally. The novel unfolds as a series of short stories or chapters, each focused on a different character at a different time, not necessarily in chronological order. Time slips and slides within the chapters as well, in frequent moments of flashback, premonition, or pause. These slippages match the disorientation of digital reading. Nevertheless, other contemporary texts that appear more formally experimental suited to illustrating the aesthetics of digital reading. Mark Danielewski's *House of Leaves* (2000), for example, with its unique typographical style and layout, simultaneous and competing narratives, and crises of reliability, has often been cited in studies of digital textuality. Steven Hall's *Raw Shark Texts* (2007) contains multimedia elements and experimental print design to capture the form of hyperlinked and multimedia reading and has also been hailed as a representation of digital aesthetics (Hayles, *How We Think* 199). The branching structures and animated features of electronic literature eschew the staid printed page entirely to embrace the possibilities of digital platforms. But *Goon Squad's* overall fidelity to the form of the print narrative is actually an asset for thinking about digital reading in that it recovers an essential characteristic of the individual reading experience: we can never actually read two things at once, but only in succession. The process of reading digital texts on digital devices is then a necessary process of narrativization on the part of the reader. To shape *Goon Squad* as a novel, Egan "pieces together bits and pieces of narrative" into a whole that nevertheless jumps around in time, space and topic (Cowart 252). In fact, many of the chapters were published as

standalone stories in other venues first, and "Black Box," which Egan has referred to as a potential chapter (Treisman), still exists separate from the novel itself, in multiple formats. The form of *Goon Squad* as a novel then requires both Egan and its readers to create coherence out of multiplicity—and reflects the work the reader must do with digital text to maintain coherence.

The work required to narrativize *Goon Squad* appears in a more literal form with the notorious PowerPoint chapter, which reminds us that hands play a crucial role in this process. The 76-page (or slide) PowerPoint presentation, "Great Rock and Roll Pauses," comes about two-thirds of the way through the novel. Its format—slides printed in landscape on the page—is an interruption of an otherwise familiar, if generically and formally varied, literary and print form. Many reviewers have engaged with the chapter merely as a clever gimmick [cite]. To characterize it this way, however, misses the important function of the PowerPoint slides to "register the affective novelty of becoming-with media" (Dinnen 151). The chapter's very gimmick-ness, Dinnen suggests, alerts readers to the ways in which digital technologies should be unfamiliar even as they increasingly register as banal and unremarkable. As a reading technology, the PowerPoint is a serious intervention into conventional print reading practices that has the effect of drawing into relief the essential bodily orientations of reading for both digital and nondigital texts.

As Allison Carruth points out, the aesthetic form and features of Egan's PowerPoint slides do not match the supposed speculative future (the 2020s) in which a fictional character produces them. As a first-time PowerPoint-user, Egan relied on the stodgy, preset corporate diagrams that come included with PowerPoint to structure her slides. The blocky flowcharts and black-and-white design belong to the earlier era of corporate presentations for which PowerPoint was originally developed. As a result, the chapter presents PowerPoint as a "retro" technology

even as it represents an innovation in the print layout of the novel (Carruth 14). Through the strangeness of the juxtaposition, both print and digital text become strange as well. The PowerPoint is neither a conventional/familiar print object, nor a clearly digital one. Ingrid Richardson argues that with habitual use of a mobile device, users incorporate the shape of the device "into our hands and the space of our bodies, such that we come to 'know' its model-specific characteristics in the same way that we know the placement of our own limbs and fingers" (Richardson 209). Extended to print reading, I suspect that readers who are familiar with the shape of a trade paperback will find it difficult to turn the pages sideways. Reading and interacting with a device—a familiar one (like a trade paperback, for many readers of *Goon Squad*)—becomes one of intimate familiarity with the object. Its affordances become your own.

The PowerPoint chapter, however, upends the familiarity that many readers have with the standard trade paperback or hard cover book. If you are reading *Goon Squad* in a printed book, turning the page to view and parse the PowerPoint initiates a series of necessary physical reorientations. First, you have to turn the book sideways to read the landscape-oriented slides. Next, you must figure out how to turn the pages of a floppy, sideways object, as your usual methods—probably ingrained in muscle memory—will be awkward and insufficient. Third, your eyes and brain need to work together to decipher the sometimes-puzzling layouts of the flowcharts and diagrams that Egan uses to organize the text. The familiar left-to-right, top-to-bottom movements that work for a traditional print text in English simply will not work. If it sounds laborious—it is. The PowerPoint, like other recent experiments with print layouts of novels, makes a physical intervention into the reader's interaction with the print object of the novel, and thus makes the reading technology of the book itself tangible. Tangible, quite literally, because the PowerPoint exposes in quite a jarring way how reading demands touch—the use of

bodily faculties that enable an intellectual or affective engagement with text. These motions are what allow *Goon Squad*'s readers to make sense of the unusual formatting that is the result of printing a digital text on paper.

Furthermore, the slides themselves require active work of narrativization on the part of the reader. In creating the PowerPoint, Egan recalls, the "templates weren't specific enough for me, and I need to begin inventing my own. There were relationships that were subtler than the templates offered, elements that just coexisted, unrelated but together" ("This is all artificial"). The slides represent a jumble of information with "unrelated" elements clustered together in novel relations. Each slide's slippery components can often be read in any order, in any orientation, and it is up to the reader to decide how best to organize the material into the arc of the story. One such slide defies narrative order, slipping around in time and space like the digital text it is mimicking as it recounts a dialogue between Alison and her father. The slide consists of four text boxes, one in each quadrant of a Cartesian graph, with arrows pointing outward at the end of each axis. There are no units or labels. The text boxes read, in clockwise order from the top left: 1) "But it wasn't your fault, right?," 2) "'It was no one's fault,' Dad says," 3) "The girl from yesterday,' I say. 'With the sick heart,'" 4) "'She died this morning,' Dad says" (Egan 292). The boxes don't make much sense read in any order—perhaps the most sensical reads clockwise from box 3, beginning with the identification of the girl. But there is no reason to assume that the slide should be read this way, and doing so in fact violates all conventions of reading in English, from left to right and top to bottom. But reading from box 1, the situation for which Alison wants to assign fault is unclear: it may refer to the death of the girl—which is below box 1—or it may refer to the death of her father's friend Rob, which appears a few slides earlier (and elsewhere in *Goon Squad).* The sudden reference to the girl is then unmoored from the discussion of fault.

The slide's ambiguous layout, the arrow-tipped axes that suggest outward movement, and the references to ideas that appear elsewhere in the novel, the slide illustrates how this digital text rewards the work of narrative construction on the part of the reader, who can choose how to assign causality (fault), and meaning to the text by orienting that text physically in their reading space.

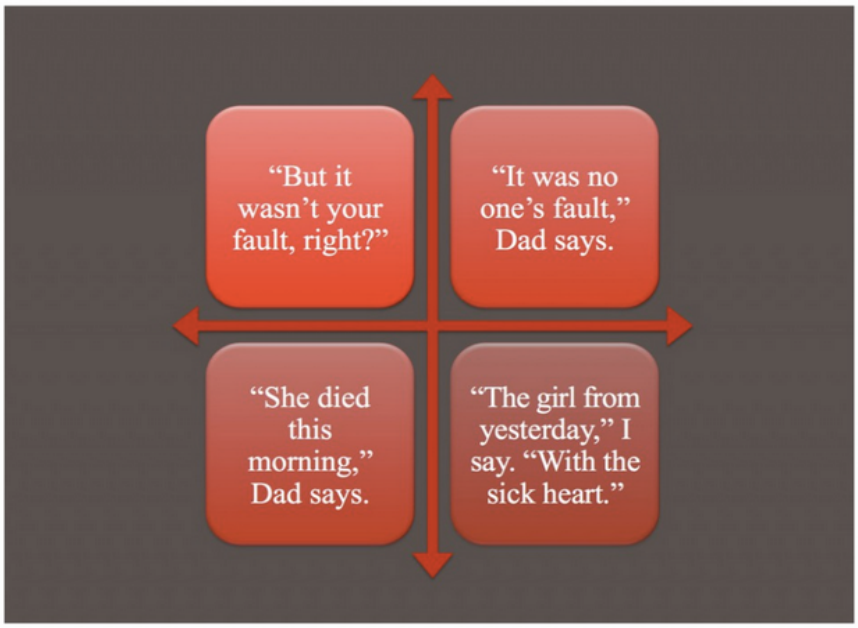

Figure 4: Slide, "But it wasn't your fault, right?"[23]

Through moments like these, the PowerPoint chapter and *Goon Squad* as a whole create opportunities for readers to engage in the haptic narrative work that digital reading requires. Digital reading solicits anxiety and pleasure through haptic engagement with the device that demand new forms of touch to suit the challenges of interpretation and comprehension on a digital touchscreen device. Organized around an advancing gamut of technological development

[23] This image of the slide appears on the archived version of Egan's website, which contains a slideshow, in color, of the black and white slides contained in the novel. The red colors here may further suggest a red heart with four ventricles and arteries carrying blood outward.

and the trope of unhinged time, the novel illuminates the affordances of reading digital texts on touchscreens, and the necessities and possibilities that emerge out of the haptic interactions with mobile devices. Putting its narrative together is the work of readers who must link the text's print form with the digital platforms the *Goon Squad* is oriented towards, and which have become salient fixtures in the lives of readers in a digital society.

The fiction suggests that it is possible to conceive of digital readers' haptic behaviors as physical narration, acts of organization and framing that string together disparate textual moments into a narrative in pursuit of satisfaction. "I Intend to Keep Scrolling Until I Feel Something," declared the title of a 2017 piece in the online humor magazine *McSweeney's Internet Tendency*. The article, by River Clegg, enters the mind of a digital reader scrolling aimlessly on unspecified social media sites. "Soon, I will feel something; I must. This can't go on forever," the reader says, yearning for the end of the "forever" time of scrolling through the "opaque, suffocating shroud of free online content." Yet in this miasma of digital media, "There's only one solution. Faster scrolling." Clegg's reader will find the end of this story, if only by the work of their thumbs moving faster and faster over the surface of the screen. Their hands, in contact with the smooth glass of a smartphone, are the only tools they have to make sense of digital reading.

5. Disciplined Reading

While these reading behaviors are skilled responses to the requirements of the text, they also remain *solicited* and *disciplined* actions. As Mc Laughlin points out, readers are taught how to behave when reading, in ways appropriate to various contexts. Furthermore, Mc Laughlin argues, these postures of reading also become postures towards state and social ideologies. The

learned behaviors of reading "implicate the reading body in social processes and disciplinary regimes," such as the injunction to remain still, silent, and receptive in school settings that then become office or factory settings (21). Readers of digital texts are taught to read by the haptic needs of their devices—haptic needs that have been engineered by profit-motivated developers with economic interest in our attention, activity, and data. The taps and swipes of digital readers become second nature, as responses to the shape of digital devices and the experience of reading moving, temporally unhinged texts. "What bodies 'tend to do,' are effects of histories rather than being originary," Sara Ahmed writes (553). The history of digital reading is being written now, in the early decades of the twenty-first century. Drawing from the work of Raymond Williams on television broadcasting in the mid-20th century, Angela Xiao Wu et al. point out that Williams' concept of "flow" is once again relevant to media consumption. Williams argued that broadcast producers curated a flow of content that kept audiences watching. These flows could then be analyzed as texts in their own right, that linked together separate elements into one sustained broadcast. Wu et al. contend that the digital architectures designed by institutions and platforms "nudge" users into flows designed to trap users into informational or financial ecosystems that provide continuous benefit to those institutions and platforms (15). These "nudges" (the haptic language is relevant here) are expressed as interface and layout choices that control a user's path through the digital textual landscape. These nudges and the flows that they create are part of the architecture of demanding, insistent devices that inspire the skilled innovation of narratives tapped out on a touchscreen. At the same time, they remain part of the strategies of commercial and governmental institutions with motivations of their own.

How, then, do the narrativizing taps and swipes of reading fingers serve the interests of the social and economic structure that solicits them in the first place? To answer this question

and by way of conclusion, I return to "Black Box" to explore how digital readers are disciplined into readers of value for the producers of digital devices and content. "Black Box" imagines a world in which reading technologies and reading humans are literally intertwined in ways that are yet unrealized in the real world. Lulu, acting as an undercover agent on an intelligence-gathering mission in the Mediterranean, must use her body and its digitally-enhanced capabilities to "read" the cues around her, and transmits that information back to be read by others. Lulu's cyborg body is itself a reading technology, both the tool through which she interprets data, and a record/platform of that data: the "black box" of the title. Her enhancements include a camera in her left eye, an audio recording device in her ear, a built-in data drive between her toes, an implant that records her thoughts, and an emergency geolocator/broadcast signal, hidden behind her knee. Lulu's purpose on this mission is to position herself to gather data—auditory, visual, and textual—about her target, then return her body, dead or alive, into U.S. custody so that it can be read and recorded. Since "Posing as a beauty means not reading what you would like to read on a rocky shore in the South of France" (par. 3), Lulu is continually reading other things: people, situations, maps, data. Guidelines on what various developments "may mean," "may communicate," "may sound like," or "may be a sign of" pepper the text (par. 18, 20, 4, 12). Her ability to interpret situations and gather data relies on a combination of her own intuition, bodily sensations, and the aid of the digital devices that are a part of that body. Egan here imagines a world in which the technologies that allow for reading are integrated with the human body, rather than accessories to it.

Lulu's experiences of reading the world therefore occur not in some liminal space between her eyes, fingertips, and the text, but within the inner workings of her own body and its

storage/interpreting devices.[24] Because the devices are embedded in Lulu's body and require her agency to operate, they also rely on the symbiotic relationship between human body and reading technology to carry out their processes. As she uploads a data cache into her toe port, Lulu advises, "You will feel the surge as the data flood your body. / The surge may contain feeling, memory, heat, cold, longing, pain, even joy" (par. 35). These affective and haptic experiences are directly related to the data—the text—that enters her body through the reading technology of the port.

Like digital readers, Lulu undergoes extensive training to take on her mission: training in the use of her implanted technology, training in perception, and training in stress response. This training is both explicit (as when Lulu recalls the instructions she has received), and implicit, as she adapts to the behavior of her body: "Your training is ongoing: you must learn from each step you take" (par. 15). At key moments, Lulu deploys the Dissociation Technique, the goal of which is to condition the body "to act and react without your participation" (par. 8). Crucially, it is only once she has successfully undergone this technique that she can "begin to gather information systematically" (par. 9). The training prepares her body and primes its information-gathering activities. Lulu's body, which is also her reading technology, must be continually disciplined into the proper orientations and behaviors in order to facilitate the reading actions that constitute her mission. In fact, the text of "Black Box" serves as a training manual of sorts for future readers: the second-person address takes the form of "Field Instructions," laying down codes of behavior for Lulu and others (par. 15). The short transmissions (each tweet) "serve as both a mission log

[24] And crucially, even though the technologies are incorporated into her own body, Lulu does not lose touch with their specific haptic contours either. She feels the "faint whine as recording begins" in her ear (par. 13), and is beset with a "bright, throbbing total blindness" after incorrectly deploying the flash in her eye camera (par. 28).

and guidance for others undertaking this work" (par. 15). In this case, the readers of "Black Box" serve as these others, as their reading practices are disciplined through the slippery form of the Twitter story.

The double nature of Lulu's Field Instructions gets at a key element of her work: she is always reading, like the users of digital technology, but also always being read, recording her thoughts for herself, but also for others. The capabilities of Lulu's new body and the demands of her mission transform her into an interface through which text can be read. All of her haptic interactions with her technologies and her material are designed to be tools to facilitate others' reading. As Lulu's readability indicates, even as digital readers read, they are conversely read by the technologies that facilitate their reading. In "Black Box," Egan connects Lulu's circumstances to the way that women have always been reading technologies: texts to be read and interfaces to be looked through. After all, Lulu's first goal is to be "both irresistible and invisible" because "When you succeed, a certain sharpness will go out of his [the target's] eyes" (par. 1). For her mission, Lulu's body should attract interaction and display information without announcing itself as a body to be noticed. Lulu's advice counsels the reader both on how to read situations and be read in this way (as a body) to produce the best result.[25] Her enhanced body facilitates both her own reading and the reading of others. As a woman, she is mostly tasked with controlling how she is read: "If you're having trouble perceiving and projecting, focus on projecting," she warns, in recognition of the relative importance of *being* read versus reading (par. 1).

[25] Like Eunice in *Super Sad True Love Story*, Lulu recognizes that she exists to be read and interpreted, though Egan's cyborg inventions tie this more solidly to her actual, rather than data, body.

The circumstances of Lulu's reading remind us that she is doing this work not for herself, at the behest and with the aid of the agency that sent her, the same one that desires this information in the first place. In this case, her actions support the national security agenda of the United States. As Egan noted in an interview with Zara Dinnen: "All they need is her body." The reader's body thus becomes an agent of the entities that discipline reading behaviors. Lulu's handlers impart this truth to her and other recruits quite directly. It is imperative that she reach the retrieval point, dead or alive, because "Your physical person is our Black Box; without it, we have no record of what has happened on your mission" (par. 38). As she is dying in the bottom of a boat, Lulu comforts herself: "Remember that, should you die, your body will yield a crucial trove of information" (par. 43). Lulu's haptic interactions with her body/reading device are the behaviors that produce the "mission log" or narrative of her journey, but they also construct her as text to be consumed. That narrative does not belong to her, but to those who actually implanted the cyborg tech into her body. In these moments, she is the reader, the technology, and the text. And of course, through the convention of the story's second-person address, so are "Black Box"'s actual readers. On whatever digital device we use to access the text, we are conscripted just as Lulu is through the technological infrastructures of digital surveillance to read and be read. The text of "Black Box" makes itself felt in these moments of address that claim ownership over the bodies of their readers.

The reader's body is the black box of the title, the technology of surveillance and recording that reads in order to be read. Lulu's handlers' reassurance that "You will perform this service only once, after which you will return to your lives" (par. 5) may be true for Lulu, but is false for digital readers, whose reading is constant, scrolling is endless. The service that readers render to their devices is lifelong. This is the truth of digital reading, as *Goon Squad's* Alex

knows: “every byte of information he’d posted online . . . was stored in the databases of multinationals . . . that he was *owned*” (316). As readers learn to continue scrolling, pulling their thumbs over the smooth surface of the screen in an attempt to piece together the fleeting digital texts that simply will not stop moving, the entities that solicited these behaviors are just as interested in the narratives that emerge from these haptic interactions. In Chapter Two, I show how readers continue to employ narrative as a tool for reading with and against larger forces that far exceed their individual reading experiences.

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2. Reading and Remembering: The Internet Novel as Memory Narrative

As of July 9, 2021, at 1:31pm PST, the Wikipedia article for the September 11 attacks has been edited 19,573 times by 5,912 different editors. In 2021 alone, it has been viewed more than 2.5 million times, for an average of over 13,000 views per day. Spikes in visits to the page occur annually around the anniversary of the attacks as people all over the world feel prompted to learn anew, refresh their memory, or even contribute to the article's framing of this consequential world-historical event. The article thus serves as a significant source of information about the events, their context, and their aftermath. A version of the article appeared on Wikipedia as early as November 21, 2001, just one month after the attacks and just ten months after Wikipedia's initial launch on January 15 of that year. Its original form was short, written in a shocked, personal style, with empty headings intended to be filled in later for categories such as "Responsibility," "Casualties," and "US Governmental Response."[26] Since then, the article has grown to 230,722 words, and includes information on Al-Qaeda, detailed timelines of the attacks, domestic and international ramifications, the US invasion of Afghanistan, and conspiracy theories surrounding the events. Its tone and style have been revised thousands of times to comply with Wikipedia's standards for objective prose.

The article's web address has remained the same throughout its twenty-year history and its encounters with thousands of editors and edits, and the addition and deletion of information or

[26] The November 21, 2001, version reads: "what might well be the most devastating terrorist attack in the history of the world occurred concurrently in New York City, Washington, D.C. and near Pittsburgh . . . All together, these pages may serve as a memorial to those lost. Your help is welcome and needed." Older versions of the current article are available through the Wikipedia Page History tool. While this version is the earliest that is still accessible through this tool, it is possible that earlier versions existed and were not documented in this way.

vandalism.[27] It has always been the same page, but different. The ongoing life of this Wikipedia article is an example of what Wendy Hui Kyong Chun calls "the enduring ephemeral" of digital information: it is paradoxically permanent (able to be recalled and resuscitated at a moment's notice) and impermanent (perpetually rewritten, refreshed, reread, and reframed). The enduring ephemerality of digital documents, Chun argues, presents a crisis for any text-based society where shared understanding rests on the availability of cited documents (published articles, legal precedents, founding documents, financial records, etc.). When those documents are unstable, wobbly, refreshed, updated, duplicated, or edited, the protocols that govern their archiving and access must reflect the new challenges that digital systems and cultures present.

Wikipedia can be edited by anyone who accesses the site; information can be added, change, or deleted at any time. The site reflects the efforts, and motivations, of an enormous, diffuse, and anonymous community. The sensitive nature of the article's content, from the motivations of the hijackers, to backlash against the Muslim-American community, to the acceleration of state surveillance and counter-terrorism measures following 9/11, means that any attempt to adequately represent facts necessarily reflects competing agendas and leaves out key narratives and voices. As an early piece of vandalism on the 9/11 article notes, "Any part of this text could be utter propaganda. I'm testing this system because I have a goal. What goal do you have correcting me?"[28] The anonymous editor is not wrong, though their contribution disappeared from the article's public face soon after it was added in January 2002. Despite its stable web address, the 9/11 article is continually remade contra its illusion of permanence. Yet

[27] Wikipedia articles, especially those about contentious current events or figures, are often subject to vandalism from anonymous editors who add spurious or abusive material. In the case of high-profile articles like the one here, these instances of vandalism are quickly caught by other editors, who can restore earlier versions of the article.
[28] https://en.wikipedia.org/w/index.php?title=September_11_attacks&oldid=282337

Wikipedia, with its extensive changelog apparatus that allows anyone to view the editing history of an article, is actually better documented than most online texts, where changes may go unnoticed and untracked. Even on Wikipedia, however, the problems of data loss and change make themselves felt. The 459 citations that the various contributors have included to back up facts and claims in many cases link to news sources that may or may not still be online at their original URLs in one-, two-, or ten-years' time. And as the September 11 attacks stats page explains, "This page is very old. Some data may be inaccurate due to how revisions were stored in the early days of MediaWiki." What is not represented in the archive of this article?

Certainly much has been lost. But in the enduring history of the Wikipedia changelog, with its edits tied to user accounts and their IP addresses, another digital memory problem surfaces. Wiktor Mayer-Schönberg argues in *Delete* that digital memory is actually too long and too permanent; that digital memory allows old material to come back to continually haunt the present. He cites the example of an education student denied her teaching license because of an old MySpace photo that showed her consuming alcohol at a party (1-2). More common examples include "revenge porn" in which individuals (mostly men) post sexual or otherwise compromising photographs or videos of former intimate partners (mostly women) on the internet, where they circulate to traumatize and harm those whose images are published criminally and without their consent.[29] In this way, digital memory intrudes on the present in unexpected ways, transformed out of its original context.

So too can state or corporate actors use digital archives for paternalistic and nefarious purposes. The events of September 11 initiated a massive increase in data surveillance in the

[29] Issues like these are the basis for the "right to be forgotten" that is a component of the European General Data Protection Regulation (GDPR) that came into effect in 2016 (Mantalero 229).

United States and elsewhere, alongside a parallel effort to justify these extraordinary measures within a national security framework. The USA PATRIOT Act, for example, gave law enforcement agencies the "Authority to intercept wire, oral, and electronic communications" in the interest of preventing terrorism and fraud (Sec. 201). In practice, these expanded powers led to the collection of civilian telecommunications metadata *en masse* by government agencies and opened the door for corporate data surveillance on a similarly colossal scale. The ongoing effects of surveillance capitalism are the subject of Chapter Three. Here, I am more interested in how this story and others have been documented in digital memory. The history of this narrative and its various textual components continue to be recorded and disputed, edit by edit, on Wikipedia and in other documents that digital readers turn to in pursuit of information.

How do online readers apprehend digital memory, which presents as the dual problem of too little and too much information, and which can be exploited to continue or mask state violence that reverberates through communities and individuals? This chapter revisits the digital text to think about reading as memory. Users of digital technology encounter digital texts as memory in that digital texts both serve as enduring, ephemeral records, and are themselves in need of recording. Media studies scholar Muira McCammon calls these gaps in institutional digital history "memory holes," where digital texts like Tweets and other ephemeral government statements disappear from public view (4). McCammon is especially interested in the deleted Tweets and social media posts of politicians and federal agencies in the United States. The process of attempting to recover deleted or disappeared digital texts through Freedom of Information Act (FOIA) requests or other means produces "memory narratives"—from government social media managers and other officials—about why and how certain texts were deleted, retracted, or edited. These memory narratives, McCammon argues, can render "critiques

of current mnemonic practices and can offer imagined alternatives" to existing conditions on digital platforms and communications (4).

Here I posit that established modes of analog reading—especially the reading of novels—can shed light on how to encounter digital forms of memory. The term "memory holes" comes from George Orwell's novel *Nineteen Eighty-Four* (1949), where they are literal holes into which incriminating government documents are placed to be incinerated. In Orwell's novel, the only traces of these lost histories exist metafictionally in the novel itself. Likewise, this chapter argues that novels can serve as model archives for the encounter with digital instability. As fictional memory narratives, novels can open up moments of instability in order to dissect and reconstruct them. These reconstructions of lost texts and moments are not "faithful," but rather acknowledge their own impossibility and subjectivity.

Ruth Ozeki's *A Tale for the Time Being* (2013) is a novel that registers the tensions between two desires for digital memory: the need to remember everything and the desire to be forgotten. Ozeki weaves together a literary interest in reading with emerging concerns about digital technology. Ruth, a writer living on a remote island off the coast of British Columbia, finds a lunchbox of print material washed up on the shore. As she slowly reads through the flotsam, including a diary, old letters in formal Japanese, a journal in French, and an antique watch, she learns that these things once belonged to a Japanese-American teenager named Nao, who may have perished in the 2011 Tohoku tsunami. Her goal, to "investigate and verify" Nao's story, is a "forensic unpeeling" of the analog and digital texts that make up the narrative (Ozeki 29, 9). Ruth's difficulties are compounded because Nao's story may have been lost on purpose: from the beginning Nao asserts her desire to "drop out of time. Drop out. Time out. Exit my existence" (7). She is speaking literally of her plans to end her life, but later this self-destructive

impulse transforms into the desire to escape digital documentation: to disappear from internet and textual memory rather than life per se.

The novel documents a process of reading that seeks to recover disappearing, retreating, and incomplete texts, both printed and digital. *Time Being* dramatizes the moments of instability that inhere in the reading of digital documents and in interactions with digital space. The novel follows the entangled threads of lost personal narratives that gesture to larger patterns of state violence and suppression of information, including those following 9/11 and World War II. Preserving the memory of these narratives through the reading of print and digital documents is a central concern for the novel and its characters. In pursuit of this goal, the novel works through metaphor after metaphor for failures of informational stability, situating the emerging framework of digital memory among other analog and cultural phenomena. The modes of archiving that appear in these metaphors become opportunities to examine how things are lost, and how they might be recovered.

This chapter explores *Time Being* as a novel that models digital reading in the face of memory problems. I argue that, as an archive, Ozeki's novel allows for the reclamation of digital texts and reading moments that are unstable due to the material and political conditions of digital platforms. In the first part of the chapter, I argue that novels present their own archive protocols that lend themselves to capturing digital instability in a human-readable format: the fictional memory narrative. *A Tale for the Time Being* performs these archive protocols explicitly as it narrates Ruth's process of reading and shapes the reader's engagement with the text. Next, I turn to Ozeki's theorization of memory as a process of reading and rewriting that forages and transforms lost moments into new tools for constructing narratives about the future. Here too, narrative is central to the process of preserving and transforming memories through time.

1. Digital Memory Problems

Reading is a central component of the novel, both in the plot's diegetic unfolding and in the narrative's extensive metafictional play. Parts of Ruth's reading are decidedly analog and pre-digital, including moments when she examines biological specimens and analyzes handwriting. And yet, the novel is also suffused, if often indirectly and subtly, with contemporary digital technologies. In Tokyo, these include Nao's mobile phone, her family's shared desktop computer and the online worlds of cyberbullying, suicide clubs, and eBay. On the British Columbian coast, Ruth contends with her unreliable internet connection, inconclusive search engine results, and spotty email correspondence. These tools and platforms are the pathways through which both Nao and Ruth make sense of their experience. Furthermore, Silicon Valley competes with Tokyo, Japan and British Columbia, Canada as the geographic and spiritual center of the novel, the point around which the gyre of the narrative revolves. On the surface it seems that the narrative shuttles back and forth across the Pacific, from Nao's perspective in Tokyo to Ruth and Oliver's home in British Columbia. But the third geographic point is Silicon Valley: the place where Nao's father found first success (working for a startup to create drone control technology) and then failure (after losing his job over his ethical objections). It is the place that Nao considers her "real" home: "It was true. I was unreal and my life was unreal, and Sunnyvale, which was real, was a jillion miles away in time and space, like the beautiful Earth from outer space, and me and Dad were astronauts, living in a spaceship, orbiting in the cold blackness" (79).

It is also the location to which Ruth keeps reaching out to find information, the internet and tech center that keeps frustrating her efforts to locate Nao. Despite the many tools at her disposal, Ruth can never find the information she is looking for. Her Google searches for the

places and names mentioned in Nao's diary fizzle out every time, yielding no or irrelevant results. A brief success is foiled when, at the moment Ruth finds corroboration that "Nao and her diary were real and therefore traceable," the internet connection fails, confirming Ruth's impression that the digital "portal onto the world . . . was always slamming shut" (150, 147). When it flickers back to life, the result is gone. Ruth's problems with reading are compounded through lost emails, computer viruses, and a speculative quantum technology that erases digital data from the entirety of the multi-universe spacetime.

Perhaps in a too-accurate metaphor for the challenges of reading in a digital age, as Ruth nears the end of Nao's diary, she suddenly discovers that the remaining pages have gone blank. The story disappears before she can read it all. In light of these reading failures, the novel asks

> What is the half-life of information? Does its rate of decay correlate with the medium that conveys it? Pixels need power. Paper is unstable in fire and flood. Letters carved in stone are more durable, although not so easily distributed, but inertia can be a good thing. . . . Does the half-life of information correlate with the decay of our attention? Is the Internet a kind of temporal gyre, sucking up stories, like geodrift, into its orbit? What is its gyre memory? How do we measure the half-life of its drift? (114)

As a reader and writer wrestling with a raft of slippery texts in the twenty-first century, Ruth discovers that digital information is in fact not reliable: it decays, drifts, gets lost and forgotten. Her initial desire to find Nao online, and subsequent failure to do so, maps onto what Chun describes as a misplaced trust in digital memory as cultural archive ("Enduring Ephemeral" 22). The internet and digital media more generally cannot be repositories for the past, because the nature of digital memory on both architectural and cultural levels is a

"constantly regenerating and degenerating archive" (11). Matthew Kirschenbaum argues that digital memory is more permanent than we suppose: the tangible traces of digital activity remain accessible to digital forensics long after systems fail (17). But Chun convincingly points out that forensic processes of recovery are necessary because failure is inevitable—systems need constant updating and maintenance to continue functioning (*Programmed Visions* 133). Even as digitization becomes the preferred method for archiving analog materials, both the hardware and software protocols used for that digitization quickly become obsolete, so that any attempt at archiving is a constant race to reread and rewrite material into new formats that can degenerate in unexpected ways.[30]

Born-digital material, including the digital texts continually emerging from social media platforms, cannot escape these challenges either. On a larger scale, digital memory suffers from the pace and unreliability of information cycles on the internet. Take, for example, former President Donald Trump's efforts to overturn Joe Biden's definitive and legitimate win in the 2020 U.S. presidential election. Trump's efforts were aided by the numerous technical apparatuses at his disposal, such as Twitter, Facebook, 8chan, and Parler, that allowed him, his allies, and his followers continually to remake the textual landscape of election outcomes. Trump's claims ("I WON THE ELECTION IN A LANDSLIDE" [@realdonaldtrump]) dominated the available reading about the election in the media. His efforts depended on the availability of his own Tweets competing with the retreating availability of actual news and

[30] Furthermore, writing for the *Atlantic,* Kaitlyn Tiffany asks, "Even if every single website and every single online post were preserved somewhere for posterity, the feeling of the internet would still be missing—the petty arguments, the 3 a.m. rushes of inspiration, the thrills and heartbreaks and blue-light nausea. So how can we remember that?"

election results from mainstream sources, which by precedent had to cover Trump's claims alongside the facts of the election.

When Twitter banned Trump from the site after four years of erratic and inflammatory Tweets as president on January 8, 2021, his thousands of Tweets disappeared from the site (Twitter). In their place was the standard message: "This account has been deactivated." In this high-profile case, each of Trump's Tweets had already been replicated across the internet: retweeted, copied as screenshots, reposted, quoted, paraphrased, and so not totally lost. The original Tweets disappeared, but they persist in multiple mutated forms, each with their own contexts and presentations: enduring, but ephemeral.[31] The originals (to the extent that there can be "original" digital documents), however, are missing from public view. As the fallout from Trump's presidency and treasonous final months continues to unfold, these unstable digital texts and texts like them undermine the citational process that makes reading valuable to civic, cultural, and individual experience.[32]

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[31] An international project called Politiwoops (run by ProPublica in the United States) tracks and collects Tweets that were deleted by the author/user. Tweets deleted by Trump himself, for example, can be viewed on the site. The archive does not, however, include Tweets that were deleted via other mechanisms (i.e., removed by Twitter or lost when an account is deactivated). Similarly, The Trump Archive (http://thetrumparchive.com/) is a site that has documented all of Trump's Tweets since 2016. The site is regularly cited by news outlets. While all of Trump's Tweets are present, the links to the original Tweets no longer work.

[32] Twitter is not the only venue, of course, for this kind of memory hole. In the early days of the Trump administration, for example, the LGBT rights section of the White House website was quietly removed. Likewise, under Trump's administration the Environmental Protection Agency's available data and information were scrubbed entirely, or altered to exclude specific terms like "climate change" and "carbon" (Waldman). While changing the official information available on the White House website is not unique to the Trump administration, and is in fact expected as part of the transition to a new administration, these particular instances highlight the challenges of reading, remembering, and archiving digital information. If not for the close attention of individuals and organizations to this high-profile site (and the efforts of Internet archiving projects, as I will discuss later), the information simply would have disappeared as if it had never existed in the first place.

The memory holes that digital instability creates are especially harmful in cases like these, where the accessibility of government documents to the public are essential to preserving the narrative of Trump's crimes.[33] As digital platforms become more and more integral to public life, the texts they collect and display also become archives for the development of state violence, as in the example of Trump's tweets and the Wikipedia trail surrounding 9/11. As McCammon suggests, memory narratives of digital memory holes can attempt to recover the losses that digital instability produces. In the context of digital historiography, memory narratives about unstable digital information allow readers to "highlight and repair a web history marked by disruption and disappearance" (Yang and Wu 2108). Where there has been a pattern of deliberate censorship and obfuscation, "remembrances constitute forms of resistance against censorship and willful forgetting as well as activist critiques of the current censorship regime" (2108).

In *Time Being*, the targets of state censorship are both digital and pre-digital. The theme emerges most clearly through Haruki #1, Nao's great-uncle who fought as a kamikaze pilot in World War II, and who writes about the violent abuse he suffers in the military and his opposition to the war. Fearful of retribution toward his family, he records these thoughts in a secret journal that is included among the texts that wash up on Ruth's shoreline decades later. The translation, interpretation, and restoration of this censored text is crucial to understanding Haruki #2, Nao's father, who likewise abhors his role in perpetuating state violence via technologies of flight. The memory holes created by state censorship demonstrate the centrality of reading to remembering where texts have been lost or deliberately obfuscated. I suggest in

[33] In 2018, a district court in New York decided that Trump could not ban individuals from his Twitter account because the platform, when used by public officials, constitutes government speech. See *Knight First Amendment Institute at Columbia v. Trump.*

what follows that contemporary novels, and *Time Being* in particular, are especially apt as memory narratives that instantiate new forms of archiving for digital information.

2. Novel as Archive Protocol

Both digital and analog materials are now commonly stored digitally. For the most part, these digital archives are left in the care of computational systems, which alone have access to the inner workings of their protocols. These are visualized through interfaces like the feed, the folder, and search results pages. The user interface of digital tools are ways of organizing the internal mechanisms of computation into visual aesthetics that respond to human needs. Behind the scenes, however, human readers are always at the mercy of the algorithm, which is what creates, structures, and retrieves archives for us. David Berry takes up the example of the Amazon warehouse as an analog archive organized by algorithm. In this massive and iterable system, an optimization algorithm arranges goods to be as efficient as possible. Contrary to ordinary common sense, this might mean scattering 500 copies of the same book throughout the warehouse based on an optimization of empty shelf space, as Berry relates (110). Human warehouse workers must "pick" goods from their assigned places when prompted to do so. Even where human agency intervenes, it does so in a system designed and maintained by an automated system. Likewise, the dominant protocol for navigating digital archives, the search engine, reduces human readers to recipients of information, rather than navigators of an archive. Archives accessible only via digital search, Jane Winters and Andrew Prescott write, confirm existing biases (the searcher finds exactly what they were looking for) and hides contextualizing relations that would challenge assumptions, create new connections, or prevent spurious conclusions (395).

Algorithms organize archives for human eyes, but the internal organization of the system, hidden from sight, is what actually makes up the archive itself. Such is the position of media theorist Wolfgang Ernst, who writes that because digital archives do not include the original objects (analog or digital) that they purport to store, the "primary operations of the archive are no longer the contents of its files but rather their logistical interlinking" (84). For Ernst, what define an archive are its algorithms: its protocols for arranging and creating relations between data. These codes of an archive constitute its meaning. Thus, the function of the Wikipedia editing history page is not only to provide links to older versions of each article, but also to collect them together to represent the page's editing history, entwining editors with word counts, reading data, and external links that tell the story of its evolving cultural meaning. The protocols of a digital archive (as an analog one) define how its contents are ultimately accessed and read by both human and nonhuman readers. This is especially important because digital texts and objects that are stored in digital archives are often accessible in no other way. Because digital texts disappear and change so quickly, the archival systems in place for remembering and recalling them become all the more important.

If an archive is constituted by its protocols, and those protocols are for the most part opaque to human readers, then perhaps what we need to be able to store, remember, and read digital texts are protocols designed to be read by humans. To this end, I turn to literary critic H. Porter Abbott's proposition that narrative is a basic human instinct, present in every culture, in every form. And in fact, Porter writes, it is possible that "memory itself is dependent on the capacity for narrative," as the faculties for both emerge together in child development (3). While narrative is an expansive, capacious term in Abbott's sense, narrative fiction (and specifically the novel) is one of the most recognizable forms of narrative in the Western tradition. The form's

protocols are those of narrative convention: a system for the documentation of events with particular tropes that present its material in specific and recognizable ways, more or less experimental depending on the text itself. The conventions of narrative fiction are the archive protocols that constitute the novel's archiving functions. These protocols are particularly advantageous for human readers of digital material when they link together shifting moments into readable narrative form.

The genre of the "Internet Novel" encompasses contemporary novels that attempt to represent and engage with life online. Entrants in this category, in addition to those discussed elsewhere in this project, include Lauren Oyler's *Fake Accounts* (2021) and Tom McCarthy's *Satin Island* (2015), novels concerned with the glut and deceitfulness of digital information. Dexter Palmer's *Version Control* (2016) and Patricia Lockwood's *No One is Talking About This* (2021) attempt to capture the dizzying pace of unstable digital lives that move onward without stopping, losing bits and pieces along the way. Others imagine a world without the internet, in which all that it currently contains has already been lost, as in Tim Maughan's *Infinite Detail* (2019), where a global shutdown leaves the world reeling in a post-digital breakdown of world order. In her 2018 novel *Severance*, in which a global pandemic wipes out almost all civilization, Ling Ma writes that "the internet almost wholly consists of the past. It is the place we go to commune with the past" (114). And yet in this novel, the internet itself is already only a memory, inaccessible through the broken iPhone the protagonist carries with her. Despite their shared content, these Internet Novels are diverse in their presentation, from dystopian time travel narratives, to millennial autofiction, postmodern-style experimentation.

What each of these novels has in common, however, is the fact that they remain novels, invested in narrative fiction as the central mode through which to represent digital technologies.

Notably, these novels do not attempt to mimic the form of the internet because that is not where a novel's strength lies. As the metafictional narrator of Oyler's *Fake Accounts* explains, "Why would I want to make my book like Twitter . . . If I wanted a book that resembled Twitter, I wouldn't write a book; I would just spend even more time on Twitter" (191). As opposed to Twitter, with its supposedly fragmentary, fleeting texts, the novel does something all its own. Ryan Ruby writes that attempting to replicate the form of digital media in a novel merely "forfeits the realist novel's capacity for sustained description in exchange for a gimmicky caricature of digital media" (n.p.). This is where the strength of the novel lies: in sustained description, the ability to balloon a single moment into a paragraph or an entire book.[34] If capturing moments of instability is the goal, then perhaps the novel is the ideal archival tool. Novels can be memory narratives for digital worlds.

In *A Tale for the Time Being*, narrative fiction's strength lies in its ability to arrest and expand time. Noting the "slippage" between her time of reading and the ongoing march of time, Ruth muses that "Fiction ha[s] its own time and logic," which is a "problem" but also its "power" (313-314). The power of fiction for Ruth allows her to return to Nao's time, inhabiting it such that she is duped by the urgency of Nao's story unfolding in "real" time, despite the fact that it likely occurred at least ten years prior to her time of reading (314). For this reason, Hsiu-Chuan Lee writes, Ruth's reading and writing are "capable of flexing time and space into linguistic and epistemic plasticity" (45). Rather than leave Nao's story in the past where it has already slipped away beyond her help, Ruth instead reinvigorates these lost moments through the

[34] As I argue elsewhere in this project, even when novels incorporate some formal features of digital textuality (as in *A Visit from the Goon Squad* or *Super Sad True Love Story*, discussed in Chapters One and Three, respectively), these borrowings from the digital world serve to highlight their contrast with the conventions of the novel form.

act of reading about them. Ruth commits to reading Nao's diary at the pace she imagines it was written, in order to "more closely replicate Nao's experience" in her "search for lost time" (Ozeki 38). The act of reading thus slows and expands the time of Nao's disappearing narrative with its constitutive, enigmatic texts, so that it doesn't disappear too quickly.

In the context of Nao's suicidal thinking, Ruth's reading becomes an attempt to rescue Nao and her family from death and forgetting. Much of Ruth's rescue mission is an attempt to restore Nao's family's memories by uncovering, reading, and interpreting the materials she finds: the record Haruki #1's wartime experiences, which were lost under the eye of the Japanese imperial army, Haruki #2's attempts to avoid contributing to military violence via technologies of drone warfare, the internet history of Nao's trauma. In the novel, the "time-giving and lifesaving power of Ruth's reading and writing" (Lee 46) is bent towards recovering the textual traces of Nao and her family, for in the digital age is it these documents that ensure their continued existence. For Ruth, Nao is a text-person who exists within and because of the diary and its paratexts, both analog and digital. Even Nao recognizes the necessity of being read: when she realizes that no one has been reading her blog, and her friend stops answering her emails, she wonders, "Maybe this is what it's like when you die. Your inbox stays empty" (Ozeki 127). To be able to recover and spend time with Nao-as-text, then, is an attempt to save Nao's life in the sense of rescue, and also in the digital memory sense of "saving" as storing or preserving.

Ruth's intervention in Nao's digital death is to save Nao via the narrative she crafts around Nao's textual traces. For as Chun writes, "Digital media, if it 'saves' anything, does so by transforming storage into memory, by making what decays slowly decay more quickly, by proliferating what it reads" (*Programmed Visions* 138). Rather than storage, in which the stored object remains untouched as it slowly decays, digital media saves material through rapid cycles

of decay and reinvention—its memory is destructive even as it preserves. In the face of such annihilation of memory in digital media, humans must "respond constantly, to save actively, if we are to save at all" (140). As a textual being in the digital age, Nao must be read to be saved. Likewise, Nao's desire to write her great-grandmother Jiko's life story, too, is an attempt to save her from digital obscurity, because without an Amazon listing for her books, Jiko will not be remembered after she dies. Nao's, Ruth's, and the novel's tasks then are to archive these memories in such a way that they will be accessible to read again in the future. Their chosen tool is narrative fiction.

For the most part, *Time Being* looks like a conventional novel, only rarely including what might be considered elements of internet form. Regardless, it is deeply concerned with instability in reading. In Ruth's search for evidence of Nao, *A Tale for the Time Being* stages encounters with uncertainty in the reading of both print and digital texts. Formally, the novel invites feelings of instability that undermine the authority, authenticity, and fictional status of the text. The novel's chapters alternate between sections of Nao's diary (written in Nao's first-person voice) and a third-person account of Ruth's life as she reads the diary. Nao's sections are occasionally accompanied by footnotes that explain Japanese terms or cultural notes. At first they are straightforward, but soon a first-person "I" begins to appear in the footnotes, and it becomes clear that the writer of the footnotes is the fictional Ruth—distinct, of course, from the author Ruth Ozeki, who also lives in British Columbia with an artist husband named Oliver. This arrangement continues through most of the novel, in which Ruth's sections are presented as a relatively straightforward narrative of Ruth's reading of Nao's diary. Toward the end, however, footnotes begin appearing in Ruth's sections as well to dispense with the illusion that these parts of the novel are delivered by an impersonal omniscient narrator. Instead, even these sections

involve the fictional Ruth mediating her own narrative. Additionally, the main text of the novel is followed by a series of appendices, themselves referenced in the (fictional) narrative, footnoted by the fictional Ruth, and then followed again by a bibliography of real-life sources. Shuttling back and forth between texts, narrators, genres, formats, fiction, and nonfiction, Ruth's uncertainty over Nao's diary seeps into the readerly experience of the novel, which evokes the instability of digital reading in a printed form. The changing status of the text, as it slides between different registers of fictionality, voice, perspective, and genre, invites the kind of unstable rereading that persists in digital spaces, too.

3. *Time Being* and Memory

What does it mean to remember through narrative? What kind of memory is this? In the novel, human memory works in tandem with digital technologies that both frustrate and promise to aid the act of remembering. Through its adherence to and breaks with narrative convention, *Time Being* archives digital materials using protocols that make them legible to human readers, and that preserve them in a format that suits human memory. It continually teaches its readers how to navigate its archive of texts as it archives them by managing expectations around what can and cannot be stored, preserved, and recalled. The novel's model of memory, it turns out, is not about perfect storage, but rather imperfect impression. As a theory of reading and remembering, this model is useful for understanding how digital memory too, through its various limitations, can be remembered through impression and stored via narrative.

In pursuit of a theory of memory in reading, the novel works through metaphor after metaphor for failures of informational stability, situating the emerging framework of digital memory in relation to analog and cultural phenomena. These metaphors span the textual

(destruction and repurposing of printed books), biological (memory loss and Alzheimer's), quantum physical (Schrödinger's cat and theoretical computing), and environmental (species extinction and the Great Pacific Garbage Patch). The modes of archiving that appear in these metaphors become opportunities to examine how things are lost, and how they might be recovered. The answer, the novel suggests, is that they can't—that lost objects, people, and texts wash up changed, every time.

Losing memories, or failing to create them in the first place, is a hazard in the intersection between digital memory and narratives of violence. At the beginning of *Time Being*, Ruth is working on a memoir of her time caring for her mother with Alzheimer's, who lives with her and Oliver on the island. In the days and eventually years following 9/11, they watch footage of the U.S. invasions in the Middle East on television. Every time this footage appears, Ruth has to explain the context to her mother anew, changing the details as they evolve. The episode ties together memory troubles with a perpetual narrative of state violence that stays the same as much as it changes. While Ruth's mother's confusion is caused by her Alzheimer's, her response also matches the memory-defying state of forever war that followed 9/11. "Days pass, and weeks. Months pass, and then years," but the memories of American military aggression do not stick, despite the continuous news coverage (273). Instead, for both Ruth's ailing mother and Ruth herself, the coverage repeats over and over again even as it evades their attempts to codify it in memory. As one of several models for memory in the novel, the problems that Ruth's mother experiences because of her Alzheimer's become problems with memory itself in the context of acts of violence and war.

The digital dimension of these problems emerges in *Time Being* through Nao and her father's engagement with the same material: the events of 9/11. In Tokyo, Nao's father likewise

experiences the repetitive and fleeting onslaught of images and information about 9/11 and its aftermath. He first becomes obsessed with the people who jumped from the towers. Nao remembers, "We kept expecting to see them again…but instead they disappeared. Did we just imagine them?" (267). Later, her dad "hunted for them on the Internet . . . staring at the computer screen, running searches. He said the government and the networks were censoring the images" (267). The elusive digital evidence keeps slipping away from him, but Nao's father keeps looking, reading, and watching in order to recall what begins to seem like "a dream" (267). Even later, he comes obsessed with following news about the war in Afghanistan online, searching for "Bombs exploding. Buildings collapsing. Beatings. Bodies" (279). Nao's and her father's memory-making about these incidents of violence requires constant updating and refreshing: the images repeat in an alliterative series that changes even as it remains the same in the rhythm of his obsession. In particular, this kind of information about disaster and violence is especially difficult to keep and remember, because it is so subject to loss, censorship, and change. In this way, the internet as a repository for violence performs the kind of suspension of memory that Ruth's mother experiences through her illness. These moments of violence reappear and are rehashed through personal experience and digital channels, so that their accurate recall is distorted by both the medium and the viewer. "September 11 is one of those crazy moments in time that everybody who happened to be alive in the world remembers. You remember it exactly," Nao says (265). And yet as Ruth's and Nao's reflections demonstrate, remembering even this most memorable of events is fraught with difficulty and change.

In the real world, the 9/11 Wikipedia article recorded these shifts in memory and perception as thousands of editors attempted to provide their most accurate account of events while necessarily trimming and eliminating previous material. The page's constant web address

but changing content resonates with another metaphor for memory in *Time Being* that centers on names and their role in marking the existence of lost information. In one example, Nao becomes interested in extinct creatures whose names are all that remain of their once-existence. These names become a kind of mantra for Nao to repeat as she meditates with her prayer beads, transformed into words that "sounded beautiful and exotic" as they are evacuated of their meaning (265). Similarly, Ruth lives in Whaletown, originally named for the thriving whale communities that frequented the bay—long since killed off by invading white settlers and their rapacious hunting practices. The people don't remember this history, but the whales with their "long memories" do, and avoid the area, "leaving only their name behind" (58). Like the Wikipedia URL, this name is technically the same, but masks a history of change that is mostly inaccessible. "A name . . . could be either a ghost or a portent depending upon which side of time you were standing," Ruth thinks (59). In the endless time of the internet—the enduring ephemeral—names are perhaps, as Ruth notes, "both oracular and haunted" in that they signify the continual loss and evolution of the information that they point to (59). The appearance of constancy masks the way in which these names and modes of remembering actually fail to store a full and accessible history. Instead, the name merely stands in for a tumultuous memory of textual transformation.

The memory of textual transformation appears most clearly in Ruth's examination of the actual text of Nao's diary. Nao writes in a worn leather book that she bought at a craft shop:

> Running her fingertips across the soft cloth cover, [Ruth] noted the faint impression of the tarnished letters. They still retained the shape of *À la recherche du temps perdu*, but they had evolved—no, that word implied a gradual unfolding,

> and this was sudden, a mutation or a rift, pages ripped from their cover by some Tokyo crafter who'd retooled Proust into something altogether new. (37)

The diary is an old copy of Proust's novel from which the original pages have been removed and replaced with blank paper for Nao to write on. Like names and web addresses, the book's cover points to one set of contents, while the interior displays another, perhaps changed from a previous viewing. The original words have been lost to time and replaced by a new set of texts. The diary is "reaching forward through time to touch you" like it is a stable object that provides insight into the moment of its writing, but Ruth also recognizes that the book has changed—mutated—not gently, but suddenly and even violently (37). In fact, the word that Nao uses to describe the crafting process that produced her diary is "hacking," linking the physical transformation of the text to the invasion of a computer system by an external actor in which data might be lost, stolen, or changed (20). Alison Glassie treats this intersection as evidence of "the fragility of [both] physical and digital flotsam in the rising, acidifying seas of our contemporary floating world" (464). The form remembers its text, but the original version is inaccessible. In fact, Nao buys this particular diary because she cannot read French, and does not want the old content to influence what she writes. Yet the clear relationship between the two titles—*A Tale for the Time Being* and *In Search of Lost Time*—reveals Ozeki's hand at play in the irony of Nao's choice.[35] Despite Nao's insistence that her work is about the time being, her diary shares with its textual predecessor an obsession with returning to and understanding the past via instruments of memory, as inadequate as these instruments may prove to be.

[35] Ozeki has said, on the inclusion of Proust in *Time Being*: "At one point I was thinking, 'Is that too much?' but then I thought, 'Nah, just do it.'" (Ty 168).

Yet the image of Nao's handwriting seems so natural, filled with "such certainty" that Ruth admires it for its own worth (Ozeki 37). Something still exists between the covers of Proust's novel, but what is it? What is the relationship between what exists now (the diary) and the text that was lost (the novel)? While the passing of time and unreliability of digital channels means that what we read is continually lost, we are also always looking to recover it. The desire to remember what was lost brings us to garbage—specifically, to the Pacific Gyre and its Great Eastern and Great Western Garbage Patches, which are further figures for memory in the novel. The Garbage Patches, Ruth's husband Oliver explains, are massive patches of plastic debris floating in the Pacific Ocean, caught in the circling currents of the Pacific Gyre. The garbage is refuse from humans, and can get stuck in the gyre for years before it escapes. Nao's diary, Oliver and Ruth speculate, could have come from there before washing up on the shore.

As the "garbage patch of history and time . . . The gyre's memory is all the stuff that we've forgotten" (114). The debris that is drawn into its center disappears from legibility, and yet sometimes, miraculously, reappears. The diary and accompanied texts that emerge from the gyre are among these unlikely reappearances. The gyre and garbage patches are figures for memory in that they are about objects that are forgotten and then remembered through a process of cyclical resuscitation. Beverly Hogue argues that Ozeki's recuperation of garbage, trash, and debris is a key theme of the novel, which recovers both textual and actual refuse in order to compost it into new meaning (70). The garbage patches and the oceanic gyre that create it are central to this premise, which centers both forgetting and remembering in the process of recuperation. Ruth connects the gyre to her digital reading practices when, after hours of researching Nao's story, her "mind felt like a garbage patch, an undifferentiated mat of becalmed and fractured pixels . . . The pixels lingered, dancing behind her eyelids in the darkness" (Ozeki

115). The pixels that make up the maze of info about Nao lodge themselves in Ruth's memory not as an organized ledger of information, but rather as a disorganized mass, "becalmed" because their emergence from that mass is still uncertain. They have made an impression on Ruth's eyelids, but their future as accessible information is unclear.

Ruth's experience doesn't look like the action of an algorithmic digital archive, in which information is processed and neatly stored for later. But Ozeki's description of this memory process also runs counter to the prevailing paradigm for thinking about the brain. Since the mid-twentieth center, the primary metaphor for human brain function has been the computer. Such is the assumption behind everything from *The Matrix* (1999) to the failed, $1.3 billion Human Brain Project, which attempted to create a simulation of a human brain on a supercomputer.[36] One of the foundational texts of the metaphor is mathematician Jon von Neumann's *The Computer and the Brain* (1958), where von Neumann identifies the brain as having a "digital character" that functions similarly to the computing machines that von Neumann had a hand in developing (43). Human memory in this paradigm should be a straightforward process of storage and recovery. Instead, Ruth's memory is impressionistic, imperfect. In fact, some neuroscientists and psychologists write against the prevailing information processing model of human intelligence, arguing that whereas computers actually operate on symbolic logic (i.e., really do "store" information in "memory" using representations of that information that can be recalled at will) humans do no such thing. Nowhere in the brain could you locate or retrieve a specific memory, because the brain does not create symbolic representations of experience that it can recall or restore. To remember something, multiple parts of the brain work together in a

[36] As Stephen Thiel documents in *Scientific American*, the project failed in part because both the research team and funders vastly underestimated the difficulty and even feasibility of the task.

mysterious process that neuroscientists do not yet fully understand.[37] As Ozeki explains, "Neuroscience has shown that memory is not an accurate representation of an event in the past. Rather, when we remember something, we're not remembering the actual event, but instead we're remembering our last memory of the event. It's an emergent and iterative process, so every time we remember, we change the past a little bit more" (Ozeki, "A Conversation").[38]

The human brain is not an archive. *Time Being*, where remembering the past relies on constant rereading of changeable texts, allows memory to be imperfect in deference to the reader's experience. Ozeki's novel presents an opportunity to imagine that unreliable digital memory functions this way too, not as a system of storage, but rather as a garbage patch, from which memories might emerge, always battered and transformed as they do. Digital memory is about information processing, but a reader's experience of it isn't. In encountering this material, the novel suggests, information is lost, and then may reappear, changed in some way. This loss is not necessarily tragic; recycling memories into new stories via the tool of narrative frees *Time Being's* characters to connect old stories to a future in which they have a new life. As with the gyre, stories are lost but also reappear in new forms.

4. Reader as Writer

To substitute a methodology of recycling for the act of remembering underscores the novel's approach to memory as a process of loss and reconstruction, rather than straightforward

[37] See Chemero (2013) and Gilboa et. al. (2004).
[38] This description is in fact quite similar to how digital memory works too, separate from the aspirational understanding of digital archives as perfect storage. The read-write functions of digital memory overwrite old iterations with new ones whenever a file is recalled from memory. The result is, as usual, both enduring and ephemeral. The difference here is that these digital processes operate on a logic of information processing, whereas Ruth's experience suggests something else entirely.

storage and recovery. *Time Being* proposes that reading is one tool of memory that produces its own memory narratives. The recycled texts that arise from reading constitute the ever-evolving and human-centric archives that acknowledge their incompleteness while remaining legible to human readers in the future. *Time Being*'s theory of reading thus relies on the continual passing of texts into new hands in order to preserve them, in some form, in memory. In the novel, the writer's text is not complete until it encounters a reader. As Nao writes to her imagined reader at the beginning of her diary: "together we're making magic, at least for the time being" (5). Nao and the reader are active participants together in the creation of something that includes, but also exceeds the words that Nao is writing. The text of *Time Being* is indeed presented as a collaboration between Nao (the original author of the diary) and Ruth (whose added footnotes track her reading and editorial process). The product of this collaboration is a new narrative that contains both the contents of Ruth's reading and the transformation of that reading into a new narrative text.

Reading what has been written (what has been archived) is not so much a process of perfect reuptake of the material, but a process of refashioning via the reading process that results in a new text to be read in the future. As she nears the end of Nao's diary, Ruth is shocked to find that the last few pages have suddenly turned blank. She and Muriel conjecture that Ruth is experiencing "reader's block," and can't access the rest of the story until she resolves her own (377). As a reader, Ruth has "agency over someone else's narrative" in that her reading process is what allows the text to continue being accessible in the present (377). The reader in this sense is essential to the continuing existence of the text within new contexts, and to the continual transformation of that text that keeps it in memory. In other words, per Rocio Davis, "acts of reading reconfigure acts of storytelling" (102).

In literary studies, the novel form already offers a mode of thinking about reading that has long positioned readers as active participants in textual making. In a reader response theory framework, readers remake texts as part of the process of reading. Stanley Fish's now-canonical *Is There a Text in This Class?* (1980) articulates the central point of this school of thinking: that readers encounter different texts based on their own circumstances and predilections at any point in the temporal process of reading. Readers in this paradigm create the idiosyncratic text that they read in response to the text and their interpretive predilections. Reader response theory itself arose from and alongside deconstructionist thinking in which textuality is itself unstable. The literal instability of digital information amplifies this theoretical concern.

In the end, the blank pages of Nao's diary only reappear with the fantastical intervention of the reader who opens up time and space to fix it. After discovering the blank pages, Ruth enters a dream version of Nao's enigmatic text in order to narrativize the impossible connections that have been forged between Haruki #1 and Nao. Here, Ruth's reading and rewriting process treats Nao's story (captured in fleeting digital traces and an enigmatic diary) as narrative does digital material: she is able to reenter and redescribe the fleeting moments when she literally pushes in between moments to stop time, look around, and make changes. Entering the dream, Ruth finds that the materiality of the diary structures its passage from past to present:

> Her fingers press against the rag surface of her dream, recognize the tenacity of filaments and know that it is paper about to tear, but for the fibrous memory that still lingers there, supple, vascular, and standing tall. The tree was past and the paper is present, and yet paper still remembers holding itself upright and altogether. Like a dream, it remembers its sap. (346)

The novel here is offering a way of thinking about textual memory as something that persists, but is malleable, open to revision and reinvention.

Does the digital medium also "remember its sap"? Is there something of paper, of the tree, in the material that makes up digital texts? While the novel suggests that there is, some information, and specifically digital information, inevitably slips away. As Ruth navigates her reading dream, she sees that "In the distance, something catches her eye amid the leaves—a pixelation, a form, a figure? Hard to say. It darts from limb to limb. A bird? The pixels cohere, darken, and the image dissolves" (347). But in the face of the disappearing text, Ruth's method reminds her that "Maybe you're trying too hard," so "She stops trying" to capture it all (347). Perfect memory, then, is impossible. Instead, Ruth's reading creates a memory narrative that explains and presents the links between forgotten moments. It creates something new out of fragments of the old in order to establish coherence of narrative. Ruth returns to passing moments in Nao's text and expands them through the narrative process: she has a conversation with Nao's father and places Haruki #1's journal in Jiko's box so that it can be read, save Nao's life, and be bundled together with the diary later on. The results of her fantastic reading and revision restore Nao's text—the missing pages reappear with the rest of Nao's story. Ruth's actions as a reader here both paradoxically recall and rewrite Nao's text in order to preserve that text in the future.

Ruth recovers the truth of the past, but also creates something new: the text of the novel, which is the archive of both Nao's diary and Ruth's reading. The novel, in turn, necessitates what Petra Fachinger calls a "foraging reading practice" to navigate its shifts in register, textual origin, language, space, and time (63). As the footnotes, appendices, intertextual references, and other unconventional movements suggest, the text is a foraged collage of elements. These

features become, for Sue Lovell, fantastical ontological bridges between levels of fictionality that can, through the magic of narrative, influence one another. As a result, any reader (the fictional Ruth or the novel's real reader) can participate in the struggle to understand (and rebuild) Nao's story (Lovell 61). The improbable chain of readers (the real reader reads Ruth reading Nao reading Haruki #1, and so on) becomes a chain of editors and writers as each transforms the text that they preserve for the next reader, or for the time being.

Nao's assertion that her diary is "reaching forward in time to touch you" can therefore refer not only to the imagined reader (Ruth) who encounters it within the fictional world, but also to the diary's movement forward into the future through its multiple readings and rereadings (Ozeki 37). The diary becomes memory via its interactions with readers, who necessarily alter the text through their reading. It becomes multiple and rewritten in every encounter, like digital memory. The digital medium "remembers its sap" even as it is recycled and remade with each new reader.

Time Being models how fiction can be a tool for producing memory narratives of unstable digital material. In the context of digital memory holes, fiction is also important for thinking about the larger ramifications of individual reckoning with digital instability. Even when recovering the original text and its truth is not possible, fiction can serve as a coherent narrative for the reading self. It may not be true, but this very untruthfulness allows other stories to continue to exist, elsewhere, for other readers. In his last official letter to his mother before flying out on his kamikaze mission, Haruki #1 reassures her that "those are not my last words. There are other words and other worlds" (258). Haruki's #1 cryptic message refers to the secret French journal that contains an account of his real experiences. But the sentiment also points to

the experience of reading such documents: that there are ever more texts that exist beyond the reach of readable memory. In Haruki #1's case and many more, these narratives are lost because of a larger system of violence and control that exerts pressure on the capabilities of memory systems to hold on to their contents. In *Time Being*, these actors include the Japanese imperial army and Silicon Valley entrepreneurs who effectively silence Haruki #1 and #2, but also the government and media apparatus behind coverage of September 11 and the war in Afghanistan. The memory holes into which texts and other narratives disappear create conditions of uncertainty for later readers—Ruth, Nao, and the novel's reader included.

While they are frustrating, these uncertainties also open up the opportunity to use narrative's strengths of extended description and fictive imagination. Ruth's impulse to "investigate and verify" Nao's story motivates her to find all of the details, uncover and read every piece of evidence. Eventually though, drawing from Jiko's Zen Buddhist teachings, Ruth concedes that "not-knowing keeps all the possibilities open. It keeps all the worlds alive" (402). In Guy Beauregard's reading of *Time Being* as a novel about the 2011 tsunami, he posits that "Ruth's reading of Nao's diary emerges as part of an extended attempt to imagine the lives of countless others who may, or may not, have survived" (Beauregard 111). Extended to the novel's other catastrophes, this way of thinking transforms the reading of memory holes and creation of memory narratives into a way to acknowledge stories that may forever be lost due to environmental disaster, or the censorship of surveilling government forces.

Allowing those stories and texts to remain lost, but still acknowledged is, as I explore further in Chapter Four, sometimes the preferable option. During the dream, Ruth and Nao's father discuss the difficulties of digital memory. Whereas he finds that "Once stuff is up there, it sticks around, you know? Follows you and it won't go away," Ruth instead notes that

"Sometimes I'll search for something, and the information I'm looking for is there one minute, and then the next minute, poof!" (Ozeki 352). Their experiences once again span the range of digital memory problems that call for careful reading and remembering. For Nao and her father, the stickiness of digital information becomes a painful liability when Nao's bullies upload videos of her sexual assault onto the internet. Haruki #2 develops a sophisticated tool that scrubs the evidence of this trauma off the web—in all worlds and timelines. The tool hides Nao's story in order to protect her by keeping it out of the wrong hands. In this context, Ruth's forensic reading and rewriting can cause harm as it infringes on Nao's desire to remain unread—or her right to be forgotten, in emerging digital legal discourse. The responsibility that comes along with the investigative and imaginative power of fiction is part of "the ethical quandary of and surrounding [Ozeki's] novel: whether and how to use narrative to respond to layered catastrophes that wildly exceed it," Glassie argues (454).

As it grapples with this ethical quandary, the novel ultimately lands on "a relationship to knowledge defined by humility, intimacy, and open-endedness" (467). Ruth's intervention into Nao's story imagines a conclusion that resolves the questions the diary raises in a way that feels satisfying to Ruth as reader. But both Ruth and Nao acknowledge that the written ending isn't the only possible one, or even the only truthful one. Perhaps, as Ruth and Oliver suggest towards the end of the novel, there are infinite worlds of possibility, generated whenever a new possibility—a new story—arises. Perhaps reading (or observing, in the language of quantum theory) is one way to both access and create these worlds. Haruki #1's "other words and other worlds" are all there, waiting to find their readers. This is where fiction becomes all the more powerful, for its very fictiveness allows for the creation of individual memory narratives that make sense of reading experience, while also allowing other stories and other experiences to go

unread or unfold differently. In the context of unstable digital records that increasingly make up public discourse, it is also powerful for individuals to be able to remember in their own way and write their own accounts of the experience. Narrative is a powerful tool—the narrative prose of a Wikipedia article is attempting to tell a story in this way too, even if it is explicitly opposed to fiction. Wikipedia seeks to be an objective source with its own standards for citation and truthfulness, but is in a sense a collective effort at the work of remembering. It is a work of creative remembering that draws from, contradicts, and exceeds other narratives about the event and its ongoing cultural ramifications.

Of course, individuals are not the only readers on the internet. And narrative, while it is a central form of human experience, is also available to these nonhuman readers: data systems, corporations, governments, and artificial intelligences, whose reach and scale of reading and narrative production is much larger. The competing reading and writing of these entities (with one another and with ordinary human readers on the internet) The dangers of such far reaching control over reading online—human and otherwise—is the subject of Chapter Three.

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3. Reading Data: Surveillance and Social Media

In April 2018, Facebook announced that an organization named Cambridge Analytica had collected the personal information of approximately 87 million Facebook users to influence the 2016 U.S. Presidential election in favor of Donald Trump (Shroepfer). Most sources agree that Cambridge Analytica, which ran much of the Trump campaign's digital strategy, significantly impacted the outcome of the election by coordinating social media posts and other targeted digital content, aided by vast data on American voters (Cadwalladr, "The CA Advantage"). The saga is a high-profile case study in the current structure and scale of data collection, data reading, and data writing. Together, these operations make up some of the most common, but invisible, operations of daily life with networked devices. Cambridge Analytica's particular operations exemplify the nonhuman, algorithmic reading and writing that occurs on a wide range of Internet platforms, and which human readers can never hope to emulate on an individual level. In this case, the networked reading of users' data became an opportunity to write these users' political engagement—and more precisely, to write potential political feelings to be leveraged during the election cycle. Although digital networks are nominally decentralized and apolitical, they become important political spaces in the hands of multinational corporations and state entities. Therefore, learning to read and be read in ways that resist the modes of being that these networks supply is at once a political and epistemological project.

Cambridge Analytica is best known for the influence the company exerted by writing user data through highly targeted ads during the election. These actions were only possible, however, because of the massive acts of *reading* that preceded them—the unsanctioned collection and interpretation of user data through Facebook and other means. It is this type of aggregated, algorithmic reading that concern me in this chapter. Cambridge Analytica is only

one member of a thriving data collection ecosystem, which includes entities and groups of all sizes, of various motivations, and with access to multiple technologies of surveillance. Some are governmental, as with the National Security Agency (NSA): the federal agency responsible for collecting and processing signals intelligence for national security purposes and whose civilian monitoring operations were exposed by Edward Snowden in 2013. Others are commercial, like Facebook and Google, which both operate massive data collection operations that help fund their services by profiting from user engagement. Cambridge Analytica sits between these two poles as a for-profit company whose political analytics work supports and influences political campaigns by using data from commercial platforms. Though their methods differ, the information that such groups collect relies on reading our online activity. Every social media post, email, search history, friend connection, app download, or bookmarked site provides an opportunity for a digital surveillance group to read the generated data, parse its relevance, and aggregate it with millions of other data points from other users, other readers. They read, in other words, our patterns of reading.

Rita Raley terms this regime a "dataveillance" society, one in which acts of discipline and control occur through the ubiquity of data recording. Today, even texts that do not immediately appear to be encoded as computational data (social media posts, profile information, the content and metadata of emails and text messages, online news articles and blogs posts) are increasingly read as data by entities who are politically and commercially incentivized to do so. As the Cambridge Analytica story shows, the information technologies that facilitate this infrastructure have effected a substantial shift in how data influences the texture of social and political life. Shoshana Zuboff's 2019 account of how "surveillance capitalism unilaterally claims human experience as free raw material for translation into behavioral data" drives home

the ramifications of these social and technological developments (8). As the raw material for data, human identity, experience, and subjectivity are constructed as data through the systems of what philosopher Antoinette Rouvroy calls "algorithmic governmentality"—a kindred term to dataveillance that recognizes how the affordances of data reading restructure the most basic social relations (157). In response to these conditions, writers and artists are confronting and making sense of dataveillance across a range of genres including documentary film, visual and experimental art, and long-form journalism. Speculative narratives and other artworks about data surveillance create, in Raley's words, "a counterimage of a . . . regime that makes that regime perceptible—and if it is perceptible then it becomes possible to work concretely toward political transformation" (137-138). When textual narratives like novels interrogate contemporary forms of reading and the relationships between readers and texts, they can stage the complex textual processes and infrastructures that make digital surveillance activities possible.

Informed by this growing body of imaginative literature, this essay examines the kinds of reading done online, and how these reading practices are in turn read and used by social media platforms, on the one hand, and the political analytics industry, on the other. Cultural representations of these practices have been recently emergent in U.S. fiction. Gary Shteyngart's 2010 novel *Super Sad True Love Story* describes a near future in which pervasive mobile technology and a failing late-capitalist state combine to produce the perfect storm of politically-fraught data surveillance. The near-future speculative novel draws from our own moment: its world is organized around a data infrastructure that serves both political and commercial ends. *Super Sad True Love Story* outlines the relationships between human readers and the nonhuman networks that read them. Although it reproduces some of the more troubling assumptions about

identity that inform data surveillance regimes, the novel also imagines modes of reading and being read that afford some people with the capacity to maintain pathways of resistance to the full legibility that data collecting entities seek and cultivate. At the same time, such technological reading and readability—and of resistance to dataveillance—is both racialized and gendered. In the novel, as in our world, the procedures of data readability have outsize consequences for marginalized bodies, whom state and corporate institutions already treat as readable, trackable, and fungible.

1. Dataveillance's Literary Counterimages

The technologies and politics of data surveillance have particular purchase for contemporary fiction in the United States, the home of many of the tech giants that provide the platforms for these data games. For example, cyberculture writ large and digital surveillance in particular are central to recent works by a group of well-known white novelists: Don DeLillo, Nathaniel Rich, and Dave Eggers. In DeLillo's *Cosmopolis* (2003) the mediating technologies of screens seem to know what protagonist Eric Packer will do before he does it. The strange omniscience of technology is inscrutable, and yet undeniable. Packer's mandate to "let it express itself" hints at this underlying data infrastructure that both reads and writes human action and feeling (51). Likewise, data becomes a narrative crux and political flashpoint in Rich's *Odds Against Tomorrow* (2013), where computational understandings of time, people, and risk both predict and fail to predict how and where disasters will unfold. In *The Circle* (2013), finally, Eggers constructs a world in which constant surveillance of individuals is the ultimate goal of a company that maps on to real-world corporations like Google, Facebook, and Amazon. In each

of these novels, data—its collection and its manipulation—serve to order and monetize human action and thought.

2. Data as Text

Human internet users read constantly, even on increasingly audiovisual internet platforms like YouTube, which could not function without the textual interfaces and labels that orient users towards the space—or the back-end coding languages—that drive the site. The data surveillance practices of algorithms, and the organizations they serve, are also explicitly textual, composed of processes of nonhuman reading that process human reading behaviors. Computers handle textual codes that are later translated into meaningful human languages. They rely on magnetic "read/write" devices as the very basis of their data storage and recall. Making these words visible, Matthew Kirschenbaum argues, restores "this post-alphabetic writing practice to recognizable registers of inscription" (3). But on a more conceptual level, too, it is useful to recognize the textual qualities of data. In computing terms, data itself is neutral, the predecessor to information. Data only becomes meaningful when processed into a version that can inform, not merely exist. Data thus precedes meaning, bias, and sense. The phrase "raw data," in both its technical and colloquial meanings, suggests that there is something natural or unprocessed about data. But of course, this is not true. To deem something "data" is an act of interpretation. Data is a plural noun, one which we increasingly use as a singular one, as I do throughout this chapter. Our steady shift to the singular elides a crucial aspect about data, that they are "related items of (chiefly numerical) information considered collectively, typically obtained by scientific work and used for reference, analysis, or calculation" ("data, n.1"). As "related items" that are "considered collectively," data are not unprocessed facts, but rather relational objects that take

on significance by way of pre-determined frames of reference. They are *aggregated* facts, which become important only in relation to one another. Lisa Gitelman explains, "Data need to be imagined as data to exist and function as such, and the imagination of data entails an interpretive base . . . data are imagined and enunciated against the seamlessness of phenomena" (3). A datum is only a datum if understood within a network of other datum—collectively, data. In this sense, data is an arrangement of smaller elements in a form that communicates meaning. To say with Gitelman that "raw data is an oxymoron" is to recognize that all data is already composed, arranged and understood in reference to a larger structure of data that has already been and must again be interpreted.

In this sense, and in the sense that digital data is always represented first in textual form (binary numbers at the very least, and actual words at its most recognizable), data is text, and data is *a* text. At the same time, data's computational applications distinguish it from non-computational text or person-to-person language. But as I will elaborate below, even texts that do not immediately appear to be encoded as data (social media posts, the information on an online profile, emails and messages, online news articles and blogs posts) are increasingly read as data by devices, algorithms, and organizations who are politically and commercially incentivized to do so. Therefore, for the purposes of this chapter, I treat data as a genre of text readable by computers and people in technology-rich environments, a genre that has its own native reading practices. Part of the goal of this chapter is to show how these reading practices can invite some of the same nuanced responses as practices associated with literary texts. If we understand the parsing of data collectors and their analytics as processes of reading text, we can see that it is an interpretive and creative act that actually produces meanings, relationships, and conditions just as literary reading does, for good or ill.

Because of the textual basis of data activities, much of our media, and especially visual media, cannot adequately represent or critically engage with the aesthetics of twenty-first-century surveillance. Digital data collection is not a process of seeing, but a process of reading, and therefore visually-based representations of its capabilities and infrastructures can misrepresent its workings. To understand these practices instead as textual practices—practices of *reading*—offers a more accurate account of their workings and effects. When viewed through the lens of reading, it is clear that data surveillance carried out by Cambridge Analytica and others is an imaginative, analytic process. These acts of reading take humans as their text, rendering people transparent as legible data. Current data surveillance schemes are only the latest in a long history of data control in the twentieth century, as Colin Koopman outlines in his genealogy of the modern "informational person" as constituted by birth certificates and other official data records. As a fictional narrative of data surveillance, *Super Sad True Love Story* makes these behaviors clear, but also offers the space to explore the smaller-scale reading that individual humans do in digital space. Again understood as reading practices, these resistant readings can counter the structuring reading of algorithms with productive reading of their own.

3. Reading Friend Permissions

The Cambridge Analytica case, which became a high-profile news story throughout 2017-2018, is one example of how mass media and political narratives around the reading of big data are emerging in twenty-first-century discourses of network technology. Robert Mercer, the prominent conservative donor and owner of Breitbart News, founded Cambridge Analytica in 2013 to run digital strategy for political campaigns in the United States. The company is a subsidiary of Strategic Communications Laboratories Group, a shadowy organization that has

been involved in commercial and political "behavior change programs" across 60 countries since at least 1993 (SCLGroup.cc). In 2013, Cambridge Analytica contracted Aleksandr Kogan, a Cambridge University psychology researcher, to create an app that would collect data from users who interacted with it. The app was called "thisisyourdigitallife," a personality quiz that, like many other apps, invited users to log in via their Facebook profile (Grewel). In voluntarily accessing the app, users granted Kogan access to information associated with their Facebook profiles, including location, name, gender, education, religious preferences, relationship status, "Likes," and friend networks. The app also gained access to a more limited set of information about the friends of users who signed up with the app. Though these friends might never have even heard of "thisisyourdigitallife," simply being connected to someone who had used it was enough to release some of their data to the developers. Between 2013-2014, approximately 270,000 people used the app directly, but Facebook estimates that data related to 87 million users was made available to Kogan and his team at Global Science Research (GSR) (Grewal).

During the 2016 U.S. presidential election, Cambridge Analytica used Kogan's database to create personality profiles to strategically target voters with messages related to Donald Trump's campaign (CA Political 2017).[39] While it is difficult to measure how the Kogan database and the profiling and targeting it afforded impacted the results of the election, it was certainly an important aspect of Cambridge Analytica's overall strategy. Following revelations in

[39] Between May 2018 and January 2019, the Cambridge Analytica website displayed a notice about the company's insolvency proceedings on its home page. In 2019, the website went defunct. Except where otherwise noted, I describe and cite archived versions of cambridgeanalytica.org and ca-political.com. Though the company's archived website claims that they are non-partisan, their client lists show that the group only worked with Republican campaigns. Cambridge Analytica partnered with GOP Presidential candidates such as Ben Carson, Ted Cruz, and eventually Donald Trump, along with the Make America Number 1 (MAN1) political action committee (a super PAC funded and run by the Mercer family that supported Trump's presidential campaign).

2016 from *The Guardian* and *The New York Times* that Cambridge Analytica improperly obtained this data (Facebook's developer policy does not allow third-party data transfer, as between Kogan's group and Cambridge Analytica), the company filed for bankruptcy in the U.K. Its leadership, however, has moved on to new projects, including Data Propria, a company that worked for Republican campaigns in the 2018 U.S. midterm elections, and which is rumored to be working for Trump's 2020 campaign.[40] The ease with which Cambridge Analytica was able to obtain so much data, their systematic reading of that data, and the effects of that reading on the political culture and electoral outcome of an entire country demonstrate how pressing it is to examine how both individual data packets and aggregated data sets circulate and are read in the digital landscapes of the early twenty-first century.

Through many media sources depicted these events as a "data breach" or an incident of "stolen" data, Cambridge Analytica's data collection methods are nominally consensual, and in fact constitute some of the basic pillars of the data economy (Cadwalladr and Graham-Harrison; Lee).[41] Until 2014, collecting data from user friends on Facebook was common practice among app developers, as Kogan explained in a 2018 interview with CBS: "This was a core feature of the Facebook platform for years. This was not a special permission you had to get. This was just something that was available to anybody who wanted it who was a developer" (Kogan). Called "friend permissions," the "feature, not a bug" was built into the platform from the beginning

[40] Cambridge Analytica was also involved in the Brexit Leave campaign.
[41] Data privacy laws in the United States have been slow to catch up with the technologies that occasion them. Legislation has been largely left up to individual states, except where such legislation affords the government powers to use powers of surveillance. Executive Order 12333, for example, has been cited by the NSA as the grounds for its license to monitor the electronic communications of Americans.

(Kogan).[42] Internal emails released in December 2018 as part of a British parliamentary inquiry into Facebook's data practices reveal that granting and controlling access to data has always been one of Facebook's top priorities. The emails show Mark Zuckerberg and other Facebook executives and department heads discussing how to monetize user data by selling access to developers on the platform.[43] For developers, "Reading anything, including friends, costs a lot of money. Perhaps on the order of $0.10/user each year," Zuckerberg writes (Collins 6). Tellingly, even after 2014, when Facebook supposedly ended friend permissions for app developers, Facebook extended the permissions to select partner companies, including Lyft, Airbnb, and Netflix (2-3). This language of "reading anything" and its monetary value to Facebook appears frequently throughout the released documents. That *reading* is the standard industry term for these operations again reveals the close relationship between data practices, exchange, and monetization and reading *qua* reading. These acts of data sharing are not merely sharing; rather, this term suggests that these acts of data sharing, harvesting, or collecting are about not only user records but also about interpreting and developing narratives out of those records. As I will

[42] Facebook revised their policies in 2014 so that developers could not collect data from users or friends of users who had not explicitly opted-in to the process, but while Facebook touted the change as an important protection for users, it was not applied retroactively. In 2019, Facebook banned personality quizzes in general as they had often been used for data collection purposes (O'Neil).

[43] Sharing or selling Facebook data to outside groups (i.e., groups that did not collect the data themselves) has always been against Facebook's policies, including in 2013 when Kogan's app went live. The Facebook Developers Policy from January 2013 prohibited developers from selling, buying, or otherwise transferring any user data obtained through the Facebook Platform—whether aggregate, anonymous, or identifiable—to third parties for any reason, even if the app first gained users' consent to do so (11.6, 11.9). Contra to this policy, however, Kogan and GSR received funding from Cambridge Analytica specifically in order to facilitate the creation of a dataset for Cambridge Analytica's use. But this is another practice that Kogan claims is widespread among developers, despite Facebook's ban on the behavior. Cambridge Analytica claims that they did not use any of the improperly obtained GSR/Kogan data in their work on the 2016 presidential election ("CA Responds to Announcement," "The Data We Used").

explore below, the ramifications of reading data in the time of social media and big data far exceed mere tabulation.

4. Shifting Surveillance Paradigms

Cambridge Analytica claims to have collected "5,000 data points on over 230 million individual American consumers" ("CA Advantage"). Even without the specific Facebook data that GSR/Kogan collected, they could have purchased similar datasets from other sources. Major data brokers such as Acxiom, LexisNexis, and Experian maintain databases with subsets for sale with personally identifiable data of all kinds: habits, purchases, phone numbers, relationships, addresses, employment, and, increasingly, online activity (Ramirez et al. 3). On the internet, any user's patterns of reading, viewing, surfing, and scrolling are fair game for surveilling bodies: governmental, commercial, or otherwise. Essentially, to be online at all is to be read.

The events surrounding the Cambridge Analytica scandal are just one example of the application of surveillance technologies in the twenty-first century. Mass digital data collection is the primary method by which states, corporations, and other group or individuals track, monitor, interpret, and surveil populations at levels that range from the individual to aggregated millions. While the mass collection of data about groups and individuals is not a new phenomenon, the growing capabilities of digital platforms and tools to accelerate and expand this ongoing collection make it newly notable. Surveillance studies have documented the entwined evolutions of communication technologies and bureaucratic state apparatuses that, together, have increasingly allowed for the seeing, hearing, and tracking of distant people. Alongside the massive state institutions and commercial systems that make them effective, technologies and infrastructures like the camera, passports and identifications cards, credit reporting, the

possibilities of biometrics, closed-circuit television, nationwide censuses, and intelligence agencies each contributed to the development of what David Lyon calls a "surveillance culture" that had cemented by the early twenty-first century (824).

The immediate predecessors to digital data surveillance in the public and private sectors are governmental intelligence organizations like the NSA and data brokers like Experian, among others. The NSA has been processing what is known as "signals data" since its founding in 1952, but the mass surveillance operations for which they are most well-known (following Edward Snowden's leaks in 2013) did not enter full-swing until 2001, when digital technologies were already becoming part of the fabric of everyday life in the United States. In the private sector, commercial data collection entities evolved out of merchant coalitions that kept records of untrustworthy borrowers in the late nineteenth century. By the mid-twentieth century, these groups had become independent organizations that collected all kinds of information about consumers for credit, insurance, and marketing purposes. One Experian executive reflects of the company's expansion in the 1980s, "We were the Google of our time. We would take five billion records and consolidate, collapse, aggregate them and build models to create a national consumer database" (Watson 11). In their own right, these were massive enterprises that took advantage of the evolving communication technologies and administrative infrastructures of the twentieth century to collect large amounts of data about large numbers of people.

With the advent of digital and networked technologies, however, surveillance went from "being an institutional aspect of modernity or a technologically enhanced mode of social discipline or control" to a banal and experiential reality that "forms part of everyday reflections on how things are and of the repertoire of everyday practices" (Lyon 825). Digital network capabilities expand collection operations to new areas of life: instead of discrete moments of

surveillance (the decennial census count, specific CIA projects) or based on commercial interactions (purchases, subscriptions, insurance, medical), surveillance technologies access individuals' activities continuously across an ever-expanding array of practices and contexts. Through connections with social media, apps (lifestyle, financial, medical, fitness, etc.), and web browsing, data collection entities can gain access to users' intimate details, all without the aid of specially planted surveillance devices. Cambridge Analytica, for one, leverages this information for political and commercial gain. Additionally, advances in digital storage capacity mean that a database with billions of records can be kept and recalled on a single hard drive, as opposed to in a labyrinth of filing cabinets or even large servers. And the worldwide infrastructure of the internet means that data collection can occur all the time, in any place, indefinitely. This regime of continuous collection produces unfathomable amounts of data—collected in plain text files rather than the multimedia, graphical interfaces through which it is created—about each person who uses networked digital devices. In this way, the digital technologies that underpin much social and commercial activity in the twenty-first century have produced a system of mass surveillance more complete than at any previous historical moment. Digital technologies actualize the attempts of previous data systems to produce a dataveillance society in which all behavior can be tabulated in textual records at any time, in any place, and for every person.

A striking gap exists, however, between the realities of data collection and perceptions of it among people who are affected by the practice. In their 2015 study of internet-using American adults, Shelton et al. demonstrate that 87% of participants were aware of and concerned about data surveillance practices that may infringe on their sense of privacy and freedom in digital spaces (3). At the same time, only 25% of those aware reported at least "somewhat" changing

their behavior or taking steps to safeguard their data against collection (4). Other studies have shown that social incentives can cause internet-users to engage in insecure data behaviors such as freely sharing personal data with unknown groups over digital channels or failing to read data privacy statements—despite claiming that they are actively concerned with data privacy and the possibility of being surveilled via their actions in digital spaces (Taddicken 248). This gap between stated intentions and actual practices with regards to data privacy is encompassed in the "information privacy paradox," where beliefs and concerns about information privacy do not translate into behaviors that match those beliefs and concerns (Barnes; Norberg et al.). As studies of surveillance and privacy have repeatedly shown, users of digital technologies might believe that they are informed about data collection, but they regularly disregard their own concerns when placed in situations where they must share personal information in order to use digital platforms (Kokolakis 122).

According to Bandara et al., internet-users lack understanding about the technologies that facilitate data collection, the entities that collect data, and the uses to which collected data can be put (565).[44] Lack of knowledge about the mechanisms and identities of data collectors in fact prevents these users from fully grasping the degree and consequence of massive data collection efforts (565). As a result of these barriers to understanding, several studies have recorded the perceived futility of attempting to escape the reach of surveilling entities. According to one survey participant: "I thought it was garbage anyways. I don't think any of our data is actually pretty secure" (Zou and Schaub 4). Choi et al. describe this attitude as a result of "privacy fatigue," a response to the belief "that there is no effective means of managing . . . personal

[44] This is also consistent with Jensen et al., who reported in 2005 that only 5.4% of users who claimed to understand the technologies underpinning data collection could actually demonstrate knowledge of those technologies (212).

information on the Internet" (42). These studies tell a familiar story about data collection in terms of how public imagines it: for most internet-users, data collecting entities are technically complex, distant, and all-powerful. Despite the increased profile and media visibility of data surveillance and specific groups performing that surveillance like Cambridge Analytica, these studies suggest that the prevailing narratives are inadequate to address the realities of big data and surveillance today.

5. Cambridge Analytica's Readable People

The larger infrastructures of dataveillance are fundamentally textual in nature, but representations of surveillance are still catching up to this textual form. In this uncertain cultural moment for digital life and data surveillance, Cambridge Analytica and its parent company, SCL, have crafted an image of their practices that draws from both older narratives of visual control and new narratives of data transparency and readability. In their public-facing rhetoric, the company emphasizes a hierarchal, visual mode of surveillance that puts Cambridge Analytica in a position of mastery over people and the political situations that they manage. In their analytical methods, Cambridge Analytica relies on a dataveillance model of textualized, readable people to support their claims about the power of data analytics. Together, both of these strategies support Cambridge Analytica's bid to convince both clients and the general public of their special purview over data and data people.

In 2000, Indonesian president Abdurrahman Wahid hired Cambridge Analytica's parent company SCL to rehabilitate his public image, which had been marred by charges of corruption and instability. Under the name Behavioral Dynamics, SCL set up an operations center in Jakarta that visitors described as a vast room filled with screens, like something out of "a Tom Clancy

novel" and reminiscent of scenes from James Bond films (Parry). The setup was, reportedly, just for show: "like a movie set to impress the clients, to calm down the family," as one visitor said. These action-thriller comparisons may be more than coincidence. In 2005, SCL hired Vision360, the same company that built control room sets for the James Bond film *Goldeneye*, to set up a simulated control room for their display at the Defence and Security Equipment International exhibition, where SCL hoped to pick up new military and government clients. According to Vision360's press release, the exhibit included

> a 12 screen media feed, a 4x3m LED presenter video wall, 62 computer screens, a large 6x4m rear projected screen plus an enormous 10x4m Operations Overview Screen, which ran at a resolution higher than film 3,500 x 1050 pixels. We also centrally controlled 12 plasma screens that were arranged around the exhibition floor, which displayed movie style trailers for each of the scenarios. ("The Most Powerful Weapon")

The overwhelming number of screens, the focus on minute visual detail in a "resolution higher than film," and the "movie style" of the simulations demonstrate a fixation on the imagery of panoptic control and expertise, communicated through the capabilities of screens: devices for displaying and watching. Designed to attract and mollify clients, these scenes and the screens that display them trade in the same tropes of vision and visibility that underpin narratives of surveillance in much news and pop cultural media. In these bizarre simulations, SCL's desired aura of expertise promotes its purported centralized control of tools of visibility.

Cambridge Analytica has not achieved the same level of theatricality in their client prospecting in the U.S., and their centers of operation have ranged from an unassuming office in a Washington D.C. brownstone to a strip mall in Texas to a space in the impressive but

traditional Charles Scribner's Sons building in New York. Their web presence, however, projects a polished veneer of professionalism and technical expertise over their data collection practices, similar to SCL's branding with Vision360. The Cambridge Analytica website is a paragon of 2010s corporate web aesthetics. The homepage's red and navy responsive layout (optimized to adjust to different devices and screen sizes) interweaves marketing jargon, corporate buzzwords, and science-adjacent language to entice potential clients into the sub-pages of the site. Each top-level page includes videos that use smooth, animated diagrams to visualize the processes of data collection, aggregation, analysis, and targeting.[45] The design is clean and glossy, and it underscores the claims that the company makes about its impressive capabilities. In a prior version of their political website archived by the "Wayback Machine," Cambridge Analytica claims to have been influential in "more than 100 campaigns across five continents," including India, Trinidad and Tobago, and the United States. Taken together, the smooth transitions, hubristic language, and accessible videos produce an experience of user-friendliness, in Alan Liu's sense of the term as the corporate adoption of "interfaces that cushion the rough corners of work within a fiction of ease even as they simultaneously display the ideal of fearsome efficiency" (Liu 164). Cambridge Analytica, its website's visual features suggest, makes complex algorithmic things simple. The mess of online activity, individual human identities, partisan politics, and complicated data analytics can be hidden behind the beautiful digital window dressings. But, as Liu points out, user-friendliness is less about actual ease of use, and instead "looks uncannily like controlled [and] accountable use" (166). Instead of providing

[45] Gitelman points out that data itself is "graphically mobilitzed" so that even those who work with data day-to-day often encounter it in the form of "data vizualizations" that transform textual into graphical material (12). The videos elide the truly textual nature of the data and Cambridge Analytica's own algorithmic and analytical processes.

transparent access to their digital presence and the processes it displays, Cambridge Analytica's website carefully structures the website reader's ability to use the site and comprehend the actual methods that Cambridge Analytica uses. Like SCL before them, Cambridge Analytica employs a carefully crafted visual aesthetic to assert their control over readerly perceptions of their behavior and over possible responses to that behavior. Aesthetic mastery over their image thus constructs data surveillance as inherently hierarchal, something that can be orchestrated from a control room filled with screens.

We may never know for certain how much of an influence Cambridge Analytica's digital strategy had on the outcome of the presidential election. Though some have tried to measure the general effectiveness of data-driven disinformation for example, the discrete contributions of massive data collection, fake news, targeted advertising, Trump's social media presence, and other digital elements of the campaign are each impossible to measure individually in retrospect.[46] For all we know, Cambridge Analytica either pulled off a masterful heist of the American political system, or simply made a lot of noise about data.[47] But for Cambridge Analytica, there was no doubt about their impact. As of October 9, 2017, the Cambridge

[46] See Persily 69

[47] In fact, both former clients and Cambridge Analytica insiders have expressed skepticism about the firm's ability to deliver on the promises that it makes. According to a 2016 story from Ad Age, multiple Republican campaigns were disappointed with Cambridge Analytica's performance, claiming that it provided services late, incomplete, or not at all, and that the company's strategies were simply not valuable (Kaye). Ted Cruz's campaign, for example, stopped using their data a few months into the relationship, as it created too much work that could not be justified by the results. And yet, despite this common theme among campaigns that hired them, Cambridge Analytica continued to find work with Republican campaigns at all levels of government. The reason, as usual, had to do with money. Mercer and his family, the primary funders and impetus behind the U.S. incarnation of the company, are major conservative donors, and according to some who worked with the group, ensuring that the Mercer money continued to flow meant hiring Cambridge Analytica.

Analytica website included a case study on the 2016 presidential election that claimed ownership over Trump's win:

> Cambridge Analytica provided the Donald J. Trump for President campaign with the expertise and insights that helped win the White House, causing the most remarkable victory in modern U.S. political history. Analyzing millions of data points, we consistently identified the most persuadable voters and the issues they cared about. We then sent targeted messages to them at key times in order to move them to action. All of this was achieved in a fraction of the time and at a much lower cost than was spent by our rivals.[48]

The campaign used these "millions of data points" in addition to "existing data in our [Cambridge Analytica's] database" to target potential voters with custom messages, including Facebook posts, Twitter messages, Snapchat stories, digital videos, television ads, and emails. According to the Make American Number 1 (MAN1) Super PAC case study, the group reached 50 million Facebook users, recorded 28 million views on their videos, and made contact with millions more on Twitter, Snapchat, and other platforms.[49] As Cambridge Analytica itself notes: the scale is staggering. And more importantly, this statement and the venture it describes reveal the specific assumptions that Cambridge Analytica made about the humans represented in their datasets. These people are persuadable, movable, and can be "consistently" targeted in a fraction

[48] https://web.archive.org/web/20171009064039/https://ca-political.com/casestudies
By March 9, 2018, the statement had been amended to remove the phrase "the most remarkable victory in modern U.S. political history."
(https://web.archive.org/web/20180319230427/https://ca-political.com/casestudies)
[49] https://web.archive.org/web/20171101024522/https://ca-political.com/casestudies/casestudymakeamericanumber12016

of time and at little cost. They are entirely legible, and manipulable through their own reading practices.

The actual methods that make up the "Cambridge Analytica advantage," as advertised on their website, are the basis for their capitalization on the textual rendering of human persons as data. The method, the site claims, uses mass data analytics to categorize people from their datasets on the "established scientific OCEAN scale," a personality model also known as the Big Five or five-factor model (FFM).[50] OCEAN rates individuals based on five personality features: openness, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae and Oliver 180). The scale has been a circulating personality model in psychology since Lewis Goldberg renewed work on lexical models of personality in the early 1980s and coined the term "Big Five" for the personality factors.[51] The lexical hypothesis, first posited by Sir Francis Galton in 1884, contends that dominant personality traits will be expressed in language about personality. Galton consulted a dictionary in order to categorize adjectives into distinct personality traits; later researchers used the second and third editions of the Webster's Unabridged Dictionary to supplement Galton's hypothesis (Goldberg 26). As the field developed, questionnaire methods became popular, in which responses to surveys were tabulated to determine the most common words used to describe personality (30). As each of these examples show, the lexical hypothesis that underpins the OCEAN scale rests on a textual understanding of human behavior and cognitive-sociocultural traits. Written language, the model assumes, is an accurate way to assess

[50] https://web.archive.org/web/20170129040815/https://cambridgeanalytica.org/about
[51] Goldberg was enthusiastic about the possibilities of personality study: "As a consequence, the scientific study of personality dispositions, which had been cast into the doldrums in the 1970s, is again an intellectually vigorous enterprise poised on the brink of a solution to a scientific problem whose roots extend back at least to Aristotle" (26).

and represent the supposedly portable and common features of human personality. The model figures human individuals as textual entities whose essential traits can be expressed through tabulated data based on lexical definitions, all long before the rise of the dataveillance infrastructures that allow CA to function.

Of course, psychology is not the only field that has understood humans as textual beings. By relying on the OCEAN model, Cambridge Analytica draws from some of the claims of poststructuralist theorists who proposed that human beings are inseparable from the language of discourses that describe and ultimately construct them. In taking up these claims, Cambridge Analytica is only the latest iteration of institutions that capitalize on the power of discourse to shape human experience in material ways. The OCEAN model served as the basis for Cambridge Analytica's ability to micro-target the humans represented in their datasets using a method called psychographic targeting. The company used their datasets to produce personality profiles for individuals based on online reading activity, and classify those individuals into "psychographic" categories based on their personality traits. Cambridge Analytica then turned this analytical work toward targeting large groups of individuals in each of these categories with specially tailored communications with the goal of producing behavioral change. As a marketing concept, psychographics first emerged in the 1960s as an extension of lifestyle and demographic targeting (Koponen 6). Psychographics was a way to move beyond the limitations of demographic categories (age, income level, race, etc.), to "put flesh on demographic bones" by providing a more information-rich and commercially actionable understanding of a consumer's motivations, desires, and preferences (Wells 198). The practice was defined specifically with reference to "measures that are truly 'mental'—attitudes, beliefs, opinions, personality traits, etc."—as opposed to culturally-defined activities and behaviors, such as group membership, ethnicity, or

media-viewing habits (Dorny 200). Far from adding "flesh" to demographic bones, however, psychographics is a way of stripping away the body to make people entirely legible and transparent, from their external behaviors to the insides of their minds.

The application of psychographics to digital datasets owes its origins to one of Kogan's former colleagues at Cambridge: Michal Kosinski, who reportedly refused to allow SCL/Cambridge Analytica to use his own Facebook app, models, and datasets, and who has been outspoken about the dangers of big data (Grasseger and Krogerus). Kosinski's research shows that it is possible to predict an individual's demographic and personality traits based on a surprisingly limited amount of Facebook data through comparison with aggregated datasets: sixty-eight unrelated "likes" are enough to know whether someone is black or white, straight or gay, comes from a divorced family, is religious, smokes cigarettes, and, crucially, where they fall on the OCEAN scales (Kosinski et al. 5804). A pattern of digital reading that produces textual data (perusing Facebook pages and clicking "Like"), Kosinki's work shows, can place people on a linguistic personality model. Though psychographics is still mostly unproven, since the election Kosinski has published further work that lends credence to the method. A 2017 study published with Sandra Matz suggests that targeted advertising based on psychological traits may in fact produce behavioral change, at least with reference to consumer products and one personality binary. Of the implications of this research, the authors note:

> recent media reports suggest that one of the 2016 US presidential campaigns used psychological profiles of millions of US citizens to suppress their votes and keep them away from the ballots on election day. The veracity of this news story is uncertain. However, it illustrates clearly how psychological mass persuasion could be abused to manipulate people to behave in ways that are neither in their

best interest nor in the best interest of society. (Matz et al. 12717)

Their apprehension about the results mirrors Kosinski's earlier discomfort with Cambridge Analytica's work, and with the ecosystem of dataveillance that renders people readable to and then influenceable by a whole host of devices, software, algorithms, and data collection entities. Cambridge Analytica's work is similar to other operations such as DoubleClick, Google's advertising analytics arm, which tracks behavior to create a data model, but does not explicitly (yet) attempt to read personality in the same way. Still, the attempt to aggregate individuals into analyzable datasets is a kindred textualizing and commodifying move. The basic premise of psychographic targeting and data collection more generally is that every person, once turned into their data double and aggregated with others, is at the mercy of entities that can read not only their behavior but also their minds. In such a system, what hope do ordinary readers have against the nonhuman reading potentials of dataveillance systems?

6. Human and Nonhuman Readers

One potential avenue for resistance to the Cambridge Analytica model and ideology of twenty-first-century political and interpersonal life inheres in a different story of psychographics. Psychographics may be Cambridge Analytica's buzzword, but the term also has a longer, even stranger history. Psychography originally referred to an occult practice popular in the late nineteenth and early twentieth century, also called "spirit writing" or "automatic writing." To produce this kind of writing, a human subject would allow supernatural forces to control their body to produce writing from the dead or other spirits. While there is no direct connection between Cambridge Analytica's use of the term and this etymology (in fact, the two uses of psychography seem to have arisen independently), the resonance between the two definitions

highlights how Cambridge Analytica takes up related ideas of automatic reading, writing, and the interaction between human and nonhuman entities involved.

In both its earlier and current senses, psychography is a method for obtaining messages from unseen forces. As nineteenth-century spirit writing, the process involved either an entranced medium channeling a spirit through their body to physically write a message, or the writing appearing spontaneously on a slate or paper through "direct" writing during a séance. The term first appeared in the writings of William Stainton Moses, a spiritualist and medium who became prominent in Britain's Spiritualist community in the late 19th century. Though Moses was likely a self-duped fraud, the term and its associated practice were commonplace features of séances in the private parlors where Moses and other mediums like him exhibited their abilities. Over the course of his life, Moses created twenty-four notebooks filled with psychographic writings, entitled *Spirit Teachings*, and in 1878 published *Psychography: A Treatise on One of the Objective Forms of Psychic or Spiritual Phenomena*, in which he recorded testimonials of psychographic experiences. He reports one exemplary instance as follows:

> Again I held out my own slate, and there came the words: —"My dear son, God bless you. Your father, who loves you dearly. —Epes Sargent."
>
> During these intervals the slate was held by me, and there was no possible way by which any human trick or jugglery could have been practised. The sunshine still streamed into the room; the medium sat there before me; no other person was present. No more stringent conditions could have been demanded, even by Messrs. Lankester and Donkin. The medium, however, writhed as if in torture every time the slate-writing took place. It was evidently accompanied by some

powerful nervous excitement on his part. (Moses 62)

Several things are notable here. The participant explicitly denies the possibility of "human" interference in the process, clearly indicating belief in some nonhuman entity that can tell this human story of fathers and sons. And yet, this nonhuman entity works through the conduit of a human body, the writhing form of the medium who is involuntarily animated by some "powerful excitement." The episode records complex interactions between different bodies and things: the medium, through whose body the text is produced, the nonhuman spirit who is called upon to make the message manifest, the human participant who witnesses the act (thus verifying it as psychography and not ordinary writing), and the produced text itself. Through their interaction and positions, each element in this occult assemblage produces the other elements *as* themselves.

This illustration of an earlier mode of psychography to its postwar form arguably mirrors the way that digital surveillance operates on and through human subjects who themselves facilitate the textual production of data to be read and written. The data that surveillance groups collect is, knowingly or not, provided by users' actions. In using digital devices and online networks such as Facebook that rely on user-provided data to function, humans often enthusiastically offer up data to be "shared" with other humans and the operatives of digital surveillance. The workings of digital surveillance entities rely on these human-centered actions, behaviors, and stories. Agency is distributed between the different humans and nonhumans—and between bodies, texts, and phenomena imagined in at once pseudo-scientific and pseudo-religious terms. Clay Shirky's account in *Here Comes Everybody* (2008) of the ad hoc collectives that the internet engenders celebrated the democratic potentials in these provisional, human organizations. But the collection of players in a dataveillance system must contend with a

variety of less familiar elements, some of which are secretive, invisible, and algorithmic. In this way, the occult origins of psychography in the nineteenth century accord with how Cambridge Analytica operates today on the model of Haggerty and Ericson's surveillant assemblage that is organized by the textual nature of modern data surveillance practices. In turn, Big Data, now a proper noun, is the occult spirit of digital space. Unseen entities read and write through us, but crucially, rely on human bodies to produce and witness the combined textual data that comes about as a result of their interaction. Psychography's longer, stranger history offers one way to destabilize Cambridge Analytica's narrative of central control over the acts of surveillance that facilitate their reading. Through this analogy, the operations of dataveillance function through the interdependent relationships between different reading actors, rather than exerting unilateral control over legible and helpless human bodies. If these systems in fact rely on the continual cooperation of a vast human-nonhuman assemblage, then humans, even as textualized data bodies, cannot be as helpless as Cambridge Analytica would have us believe.

7. *Super Sad True Love Story*'s Readers

Because these data organizations operate invisibly, however, often in the background our daily experience with online spaces, it can be difficult to get a read on the contours of the data flows and infrastructures that make up the dataveillance ecosystem. Fiction is one imaginative form that affords a means to clarify and apprehend these relationships. The issue is particularly germane to contemporary fiction in the United States, the home of many of the tech giants that provide the platforms for these data games. *Super Sad True Love Story* takes up dataveillance in explicit terms. Published in 2010—three years after the iPhone's debut and the year that Facebook announced it had reached 500 million users—the novel imagines the effects of

ubiquitous mobile network technologies on human readers as well as their modes and media of reading. Specifically, Shteyngart's novel emphasizes the human reading behaviors that underpin our interactions with technological devices and the data generated by those interactions. In the novel's attention to the reading practices that drive networked technology, it puts online reading practices like those that Facebook and Google foster and monitor in contact with the forms and habits of literary reading associated with print novels. *Super Sad True Love Story* thereby considers digital reading practices in their dataveillance context and with the same seriousness historically afforded to analog reading. The digital reading that human readers do cannot achieve the reach or computing power of dataveillance organizations like Cambridge Analytica. And yet, in *Super Sad True Love Story*, skillful human reading of data—from perusing social media to online political organizing—ushers in provisional resistance to the regimes of big data and its political goals.

Super Sad True Love Story takes place in a near-future New York City where "äppäräts" (wearable, smartphone-like devices) constantly transmit data about their owners to other äppäräts—and hence on to other human readers as well as surveilling governments and the corporate groups from which those governments are all but indistinguishable. In other words, the world of *Super Sad True Love Story* is, like the world of mobile digital technology we already inhabit, one of constant dataveillance. These data operations take place within a fraught political context in which the authoritarian "Bipartisan Party" systematically targets people of color and political dissidents along with all people deemed "Low Net Worth Individuals." At the same time, these Bipartisans—together with multinational corporations, political collectives, and many individuals—read, collect, analyze, and manipulate data for their own political and economic goals. Through this speculative plot, *Super Sad True Love Story*'s imagined digital infrastructure

offers multiple analogues to Cambridge Analytica and other real-world data collection entities that read and write beliefs and behaviors. Previous studies of the novel mark Shteyngart's depiction of surveillance as useful for understanding life within digital networks. Raymond Malewitz considers how Shtyengart's "digital fantasies of posthumanism" mirror new expectations for human bodies and behaviors when social life is structured by data (109). Luna Dolezal reads the novel as a fable of the biopolitical control afforded by biometric and other tracking technologies. And Simon Willmetts emphasizes the political conflicts that unfold around the characters to question what kinds of autonomy and justice are available in a world of surveillance capitalism.

But the novel also takes up the emerging consequences of a dataveillance society for a variety of textual practices. More specifically, it shows how the daily habits of individuals—their continual reading of data and digital texts on networked devices—facilitate and respond to the workings of dataveillance. In making this argument about the novel, I define data to be a genre of text, one which can be produced and read by algorithms, machines, and humans, if to different degrees and for different ends. To dataveillance systems and human readers alike, online texts (from social media posts written by humans to the data that arises from aggregated patterns of internet usage) are all read as data. Both the daily habits of internet users and algorithmic data collection activities, then, are entwined modes of reading that interpret digitally-produced texts for specific ends and within a common networked environment. This reading is not the same as offline or literary reading, but neither is it entirely alien from it. N. Katherine Hayles identifies three distinct, but intertwined modes of reading that already operate together in the daily reading behaviors of humans: (1) close reading (the attentive analysis of linguistic features), (2)

hyperreading (the quick, sporadic, and targeted reading of digital resources[52]), and (3) machine reading (the parsing of large datasets using machine tools) ("How We Read" 74). A literary scholar might, for example, use a Google search to locate an online text (machine reading), skim the resulting article to identify the relevant sections (hyper reading), and then home in on specific passages to analyze the author's meaning (close reading). In comparing the machine reading of dataveillance actors and the individual reading of humans in digital environments, I am thus expanding the relationships of close, hyper, and machine reading to the larger system of readers and texts that make up our data society. When a human reader encounters an online text, they may hyper or close read it—or something in between—but whether or not they are aware, a machine reader is always participating in this act of reading as well, thus entangling all three within the political world of dataveillance.

In a recent essay on social media and literary production, Michael Miller argues that online textual behaviors offer only a fleeting fantasy of political engagement, while making the case that "the literary" qua literary is a field that can foster critical depth and political agency (70). Participation in online textual spaces is undoubtedly entangled with data-driven capitalism and the political systems that advance it. And yet, contra Miller's argument, I read *Super Sad True Love Story* as a novel where the "broken stylistics of fragmented content delivery that characterize most users' experience on the internet" are themselves important formal interventions into the politics of reading (Miller 68). As a speculative narrative of dataveillance

[52] Hayles adopts this term from James Sosnoski's 1999 essay, "Hyper-readers and Their Reading Engines." Sosnoski identified this kind of reading in response to earlier digital and web technologies that primarily unfolded at stationary, relatively specialized desktop terminals. Writing in 2011, Hayles expanded the term to include the laptops, mobile phones, and tablets that were available by that time. In 2020, hyperreading occurs in expanded and more ubiquitous forms on both these platforms and newer devices that facilitate even quicker, more dense reading experiences.

set in a near and familiar future, *Super Sad True Love Story* reveals how applying a lens of reading practices to dataveillance clarifies how data collection entities and human readers interpret, make meaning of, and also manipulate digital texts to meaningful ends. In so doing, we invest online reading habits and platforms with the creative and social potential that reading engenders in other contexts.

In both its concerns with reading and being read online and its formal representation of those concerns, *Super Sad True Love Story* illustrates the new conditions of data collection. First, it dispenses with the notion that surveillance is predominantly visual and instead shows how textual data surveillance increasingly is as an operation of reading. Second, the public orientation of the many different texts circulating in the novel matches these same conditions in the real world, where online texts are readable as data both by other humans and by the algorithms that read on behalf of various data collecting groups. And third, the novel replicates the effects of data collection by explicitly rendering its human characters as textualized, data versions of themselves.

Super Sad True Love Story unfolds as a modern-day epistolary novel in which the characters exist only as the online texts (the data) that they produce about themselves, unmediated by third-person narrator. The novel alternates between protagonists Lenny's and Eunice's posts and messages on the GlobalTeens platform, a social media network that is used by almost everyone in the world of the novel ("No one *ever* gets deleted from GlobalTeens") (55). Lenny's posts, written to himself, are private diary entries, but are hosted on the site, and are later revealed to the public. Eunice's posts are mostly public communications, "Long-form English text" messages and chats between her and her friends and family. Comprised entirely of these textual objects written and read by the characters, the novel does not include a top-down or

outside-in view that would suggest an external, surveilling point of view. The perspective, for instance, of third-person narrator who makes readers imagine an omniscient entity who apprehends the characters and events partly through its senses (vision, hearing, and maybe even smell) is absent in *Super Sad True Love Story*. But neither does the novel employ a more intimate first-person narrator who is privy to the thoughts and emotions of its characters. Instead, like an epistolary novel, the text is comprised of other texts, texts that these character-narrators produce about themselves, and for other people. However, unlike an epistolary novel, readers do not have to imagine themselves intercepting the mail, reading over the shoulder of the letter writers and recipients, or finding the letters archived in a dusty attic box in order to make sense of the letters' appearance in this form. As texts written and published on a digitally networked platform, these texts were always destined for public consumption. This is the form of dataveillance: everyone is always reading everyone else's letters.

In its final pages, the novel reveals a last-minute plot twist that speaks to these formal strategies. The last chapter, "Notes on the New 'People's Literature Publishing House' (北京) Edition of the Lenny Abramov Diaries," reveals that the text we have been reading is a compiled version of Lenny's and Eunice's GlobalTeens posts, published anonymously in the form of a novel several years after the main events that comprise the aggregated text (324). Lenny complains that he never could have known that "Some unknown individual or group of individuals would breach my privacy and Eunice's to pillage our GlobalTeens accounts and put together the text you see on your screen" (327). The language of breaching one's privacy and pillaging one's writing paints the unknown author-compiler as a rogue actor or individual criminal. However, the culture and infrastructure of digital technologies that *Super Sad True Love Story* depicts undermine this characterization. As is consistent with actual platforms such as

Facebook, GlobalTeens offers little to no data privacy assurances, either relative to other human users or to its own data collecting systems and servers. In his entries, Lenny writes to "you, diary," a "you" that becomes inaccessible to him when he "can't connect" to the Internet or "even to you, diary" during the network shutdown at the end of the novel (270). Who is this "you," then, other than some nebulous, networked public whom Lenny must address in order to write? In this context, Lenny's diary entries, like Eunice's messages, already constitute a public text oriented toward an implied reading public formed through networked devices. In fact, though Lenny denies it to be true, he has "been accused of writing my passages with the hope of eventual publication, while even less kind souls have accused me of slavish emulation of the final generation of American 'literary' writers" (327). Even if he is not writing with an eye toward traditional literary distribution, as he claims, Lenny's texts retain this outward orientation, designed not for eventual but rather for immediate publication to the GlobalTeens platform.

Though framed as a breach of privacy, then, the aggregation and publication of the two characters' writing underscore that such texts are always publicly accessible, by other human readers and by the reading behaviors of data collection entities. As anyone who has downloaded their Facebook data has experienced—perhaps in a shock of recognition—social media sites and other digital platforms continuously cache, track, and analyze their users' activity. A whole suite of Google's email, virtual meeting, and file sharing services rely on exactly this set of practices. To determine whether a message is "important," whether it needs to be replied to ("Follow up?"), whether it should have an attachment ("You wrote 'is attached' in your message, but there are no files attached…"), and (since 2018) whether to suggest potential pre-written responses, Google's algorithms read exactly what its users write, when they write, to whom they write, and

then speculate as to why. Given that Google runs the largest targeted advertising services in the world, it is inconceivable that this information is used only to improve user experience, a point their privacy policy strives to emphasize over the fine print. Google's 2019 policy reads: "We also collect the content you create, upload, or receive from others when using our services. This includes things like email you write and receive, photos and videos you save, docs and spreadsheets you create, and comments you make on YouTube videos" (2). The stated purpose of these actions is "to provide better services to all our users," but other parts of the policy reveal that those services include serving advertisements and connecting users with third-party entities (2). In the fictionalized version of this environment of constantly flowing data, the entries and messages that Lenny and Eunice write are never private, but instead circulated on a global digital platform where they would be read by other humans, machines, and the governmental and corporate data collecting entities that deploy and drive digital infrastructure.

As they live their lives through these public, textual forms, human readers themselves become objects of dataveillance—data beings rather than human ones. *Super Sad True Love Story* imitates both the practices of machine reading and the less formalized systems of data sharing, such as the informal, habitual acts of reading that occur when we scroll through a friend's posts and publications in digital space. Because every word of the novel turns out to come from such posts, there is no external view on the data they generate and embody. That is, Lenny and Eunice exist only as the textual versions of themselves that are produced through acts of reading and writing. Our ability to know their lives as readers, in turn, inheres in the textual traces of their behaviors in digital space, much like the textualized versions of the many people read by Cambridge Analytica. By the end of the novel, Lenny recognizes how powerful his data is. Finally at peace with the fact that this physical body will age and die, he muses over "what

will be left? Floating through the ether, tickling the empty belly of space . . . my data, the soupy base of my existence uptexted to a GlobalTeens account. Words, words, words" (304). Lenny recognizes that the textual version of himself, the only version of himself accessible to either readers of the novel or diegetic readers of his data, is the version that matters.

Within the novel, these data bodies are what matter to us as readers, to the publics of GlobalTeens, and to the corporations who mine it to exploit Lenny and Eunice's vulnerabilities for commercial and political purposes. In the actual world of dataveillance, likewise, data bodies are the operative versions of human readers that matter to data collection entities. Kevin Haggerty and Richard Ericson refer to this surveilled object as a person's "data double," produced when an individual's every online action is translated into a stream of text that can be read by computers and software, and eventually by other people when these behaviors are tabulated and recorded for analysis (606). Although, as Hayles argues, digital experiences are embodied experiences, digital surveillance is not so much concerned with human bodies as with the textual data that represents them in digital spaces. That data prescriptively constructs each human actor as a composite of their textual data. A data double is not just a representation of a human person, Raley thus argues, but comes to constitute actual life, as when "the composition of flecks and bits of data into a profile of a terror suspect, the re-grounding of abstract data in the targeting of an actual life, will have the effect of producing that life, that body, as a terror suspect" (128). The reading that Lenny and Eunice do, as with our own reading when in digital spaces, helps create these data doubles upon which the structures and activities of the dataveillance society act.

According to Rouvroy, the existence of the data double precludes the individual from acting as a political or affective subject. Algorithmic governmentality (i.e., dataveillance) "does

not allow for the process of subjectivation to happen, because it does not confront 'subjects' as moral agents . . . but attunes their future informational and physical environment according to the predictions contained in the statistical [data] body" (157). Less subjects than the shadows of their data doubles, humans acting within this system lose control of their reading as individual acts of creative agency or political action. Rather, individuals and their reading behaviors are conscripted into service as surveilling nodes in this system, for themselves and for others. We are arguably compelled to produce the data body through the expectations of what Clare Birchall calls our shareveillance society, where individuals must share, and must surveil that which is shared, in order to participate in broader structures of work, family, friendship, and so on. The expectation of "sharing" is built into the architecture of digital and political life, on a technical level (internet protocols share by default), and on a social level (participation in public life demands engagement with networked media) (Birchall 4, 2). Individuals who do not conform to these expectations rouse suspicion and even disgust. *Super Sad True Love Story* registers this imperative. Looking for "scannable faces" to recruit for his sales pitch, Lenny notices "there was this one guy who registered *nothing*. I mean he wasn't there. He didn't have an äppärät, or it wasn't set on 'social' mode, or maybe he had paid some young Russian kid to have the outbound transmission blocked. And he looked like a nothing. The way people don't really look anymore. Not just imperfect, but awful" (34-35). Though he is supposedly looking for faces to scan, Lenny's äppärät is at a loss when confronted with a face not accompanied by the streaming data of a digital device. Whether his äppärät is missing, not set to "social," or turned off, the man without the data ceases to exist for Lenny and the digital society he inhabits. When the data double is gone, so is the man, despite the undeniable presence of his body. This does not mean that the man is safe from the scrutiny of reading surveillance systems, however: when they land

in New York, the man is arrested, at which point he disappears from the narrative. He must be written out of the text, the novel suggests, because no one can exist outside of a dataveillance society.

8. Reading in the Data Landscape

In presenting the text of the novel as a compilation of digital textual objects, *Super Sad True Love Story* replicates the source texts of dataveillance. Furthermore, by putting the reader in the position of reading these texts, it also positions reading itself as an exercise of surveillance that implicates readers as nodes in the reading/surveillance assemblage. Readers of the novel, akin to their habits as online readers, must then take on the guise of reading others being read by dataveillance. But within this environment of big data, reading as an ordinary, human behavior is a threatened and fraught activity. "Real" reading seems to disappear, replaced by a compromised version. As Lenny reflects: "Reading is difficult. People just aren't meant to read anymore. We're in a post-literate age. You know, a *visual* age" (277). Lenny's complaint is yet another example of the widespread sense that digital life is visual life, and that *real* reading happens in print, and specifically in literature.[53] Anything else simply does not count. And yet this is a novel that is deeply concerned with the writing and reading of all kinds of texts. The characters of the novel are constantly on their äppäräts, scanning others for their data, browsing the news, scrolling GlobalTeens, shopping and chatting. In a literal sense, they are always interacting with text. In their roles as data subjects, they are always producing it. They are, in other words,

[53] This is a perspective that, as Hayles points out, has continued to prevail to various degrees in literary studies, where individuals and institutions continue "to view close reading of print texts as the field's essence. As long as this belief holds sway, digital reading will at best be seen as peripheral to our concerns, pushed to the margins as not "really" reading or at least not compelling or interesting reading" ("How We Read" 65).

constantly reading. So when Lenny decries the "post-literate" nature of the new world, or when GlobalTeens urges its users to "Switch to Images today! Less words = more fun!!!" (27), they are pointing only to the irrelevance of a certain genre of reading: slow literary reading that starkly differs from the reading practices that users of digital technologies perform on a daily basis.

And in fact, the surveillance society of *Super Sad True Love Story*, as of digitally-inflected life in the twenty-first century, does demand specific reading practices and orientations toward reading. Reading in the novel is systematic, machine-like, and always digital. Like many of her generation, Eunice "never really learned how to read texts . . . Just to scan them for info" (277). What does it mean to "scan," as the subjects of *Super Sad True Love Story* learn to do as reading? The only other uses of "scan" within the novel use it as a verb for äppäräts, as when Lenny uses his äppärät to scan the data of potential clients in the airport lounge. It is associated, that is, with an operation of machines. Eunice distinguishes scanning from "seriously READING:"

> Anyway, what kind of freaked me out was that I saw Len reading a book. (No, it didn't SMELL. He uses Pine-Sol on them.) And I don't mean scanning a text like we did in Euro Classics with that Chatterhouse of Parma I mean seriously READING. He had this ruler out and he was moving it down the page very slowly and just like whispering little things to himself, like trying to understand every little part of it. I was going to teen my sister but I was so embarrassed I just stood there and watched him read which lasted for like HALF AN HOUR, and finally he put the book down and I pretended like nothing happened. (144)

Here we see what scanning is not: the slow work of comprehension and interpretation, with attention to detail. Scanning, then, is about speed, "getting the gist," and general or aggregate knowledge. In contrast to Lenny's literary reading, Eunice's reading habits resemble those of the algorithms and software that collect data rapidly and broadly from social media and other digital activities. Reading, what Eunice calls "scanning," in *Super Sad True Love Story* is an operation mostly performed by and for machines, as when Lenny's äppärät searches for relevant information in a crowded room. Eunice's preferred reading behaviors mirror this machinic procedure. The injunction against longstanding "human" forms of reading is apparent in the widespread belief of young people who complain of Lenny's books, "Duder, that thing smells like wet socks" (37). Reading is an activity done on and by digital machines, and the aversion to books as the containers for "texts" conveys a preference that the novel imagines to be culturally dominant for data doubles over actual bodies and objects. The material form of books is odious (and odorous) to these "sleek digital creatures" for whom reading (if it must be done) ought to occur within the data streams of an äppärät and as quickly as possible.

Reading thus takes very specific forms in the novel, at once continuously solicited and heavily policed as procedures of the constant sharing and consumption of data. As with actual data collection systems in the early twenty-first-century, digital systems in the novel benefit the state and other surveilling parties. The United States of *Super Sad True Love Story* is on the brink of financial and political collapse. The Bipartisan regime exploits the political instability by fueling consumerism and suppressing dissent, aided by overtly racialized propaganda and violent tactics of discrimination against ethnic groups and "Low Net Worth Individuals" organized by their military arm, the American Restoration Authority (ARA). Eventually, the Chinese and Norwegian creditors who are overseeing the whole affair step in to take over in a

corporate paramilitary restructuring of life as Lenny knows it. Paramount throughout this entire process is the Bipartisans' ability to control Americans' access to information. They care how, what, and when their subjects read. On the most obvious level, reading is about internalizing meaning, as when the American Restoration Authority posts signs reading, "The Boat is Full / Avoid Deportation / Latinos Save / Chinese Spend" (54). Reading, then, is understood to be an operation of meaning-making, and specifically of communicating politically-charged meaning from state/corporate groups to the public.

But more insidiously, reading under the American Restoration Authority's rule is designed to control the reading habits of its readers, to fold them into systems and assemblages that rely on reading processes to function, and to construct them as readers at all, who consent to codes of behavior and actions taken against them, merely by interacting with text in a certain way. Returning to the United States after his time abroad, Lenny encounters a military checkpoint accompanied by the following sign: "IT IS FORBIDDEN TO ACKNOWLEDGE THE EXISTENCE OF THIS VEHICLE . . . BY READING THIS SIGN YOU HAVE DENIED EXISTENCE OF THE OBJECT AND IMPLIED CONSENT" (43). There are instant resonances between this moment and messages like these that appear in the headers of various web services: "This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy." Similar, too, are online spaces or platforms where functionally unread Terms of Service and Privacy Policies (like Facebook's or thisisyourdigitallife's) demand the consent of users to data mining or other reading behaviors on the part of the platform. Thisisyourdigitallife's End User Agreement, for example, contained the following straightforward explanation of data privacy, or the lack thereof, in their practices:

> If you click "OKAY" or otherwise use the Application or accept payment, you permit GSR to edit, copy, disseminate, publish, transfer, append or merge with other databases, sell, licence (by whatever means and on whatever terms) and archive your contribution and data. Specifically, agreement to these Terms also means you waive any copyright and other intellectual property rights in your data and contribution to GSR, and grant GSR an irrevocable, sublicenceable, assignable, non-exclusive, transferrable and worldwide license to use your data and contribution for any purpose. (2)

Even if users read this or other contracts that they supposedly agreed to, would these statements have given them pause or prevented them from using the services provided? Do these statements suggest that users consent to being personally targeted by political campaigns? Purportedly and in potentially legally enforceable terms, yes.[54] In each of these situations, undisciplined reading of digital texts produces readers as certain kinds of readers, ones who are acquiescent to the demands made in the text simply by virtue of reading (or scanning) it. In these data collecting systems in our world and in the novel's, reading is no longer a relation between a text and an individual subject but instead is leveraged as the constitutive data of a textual body.

Readers in *Super Sad True Love Story* and real readers who encounter messages like those above are conscripted into the reading assemblage of data collection and policing. When Lenny and his friends turn on the Form-A-Community (FAC) interface, they begin generating data not only about themselves, but also about every other person in the bar and the relationships between them: "my MALE HOTNESS was swiftly falling to last place out of thirty-seven, thirty-eight, thirty-nine, forty males," whose "average income hovered at a respectable but not especially uplifting 190,000 yuan-pegged dollars" (92). The occupants of the bar literally "Form-

[54] For more on informed consent and privacy contracts in digital spaces, see Bechman 35.

A-Community," one constituted by the data already collected and stored online that travels between them. The fact of these people's gathering in the bar becomes data, but so does their reading of that data. In other words, these processes of data-based reading (scanning text, scrolling a screen, and reciting aloud) are operations that produce yet more data to be read.

As becomes clear later in the novel, this information is valuable to certain malevolent political-corporate groups, who use it to interpret the affective, economic, and ideological relationships between people, spaces, and affiliations in order to perpetrate violence and maintain power. Near the end of the novel, the corporate paramilitary forces exploit Lenny's location data and relationship with Noah, his politically active friend, to target Noah's ferry for a missile attack. The ferry, with its hundreds of passengers, sinks. If this seems extreme, consider that at least five hundred major law enforcement departments in the United States have partnered with Geofeedia, a tool that connects social media posts with location data to target gatherings of activists and protesters. Until 2016 when the ACLU issued a statement about the app, Geofeedia had agreements with Facebook, Twitter, and Instagram for privileged access to read user data (Cagle). As Birchall points out, cultures of digital data surveillance force individuals to become agents of surveillance while also condemning them to being surveilled. The compulsion to share is also the compulsion to scroll, view, curate, and read, each of which action generates its own shareable data. To participate in networked life at all, then, is to become the textualized, readable data bodies that fuel entities like Cambridge Analytica, bodies who are susceptible and essential to the intrusive reading of big data.

9. Online Reading as Tactic

In aggregate, the users of digital networks whose frequent and often banal acts of writing and reading are read deeply by machines and their programmers provide the material for big data to do its work. But are there tactics individual human readers can or should pursue in resistance to big data and its platforms (from the fictional GlobalTeens to the all-too-real Facebook and Cambridge Analytica)? Eunice, who serves as the avatar of digital culture in the text, offers one possible model. Eunice's comfort with digital life makes her the ideal subject of surveillance: she reads and writes online extensively, meaning that she is trackable, exchangeable, and entirely invested in herself as a reader (composed) of data. And yet, her reading habits point to the potentials that can arise from existing both illegibly and legibly within digital networks. Rarely seen without her äppärät, Eunice reads (or scans) all the time, on a variety of devices and surfaces, in multiple languages, and for many different purposes. Eunice's chapters capture emails and chat logs between Eunice and her friends and family on the GlobalTeens social networking site. The novel contrasts Eunice's fragmentary, "illiterate" language on these platforms with Lenny's style of diary writing, characterized by complete sentences, ordinary syntax, and proper punctuation. Her "clickety clack" mode of communication is full of spelling errors, misused words, and vulgar neologisms, a style that seems to indicate the fragmentary nature of her identity as a data double that has no coherent form (53). But while Lenny, and arguably Shteyngart by extension, disparage her digital grammar, Eunice's mode of reading and engaging with text is in fact skillful: it is attuned to nuance and wordplay, even as it abandons some cultural and linguistic standards. She writes to her friend after Lenny meets her parents:

> Dinner with la famiglia was a disaster, as you rightfully predicted. Why on earth did Lenny think he could charm my parents? You know, he is so FULL of himself sometimes. He has this American white guy thing where life is always fair in the

> end, and nice guys are respected for being nice, and everything is just HONKY-dory (get it?). He went on and on about how I can form sentences and how I always talk about taking care of Sally, and meanwhile my father is just flexing his fist under the table. Believe me, that flexed fist was all Sally and I could think about while old Len went on his little dietribe. (198)

Eunice here draws from and combines two languages (English and Italian—which she picks up on a whim), plays with words ("HONKY-dory," in reference to Lenny's large nose and whiteness), and leverages sophisticated vocabulary ("dietribe" is perfectly legible, and the misspelling introduces a culinary pun that plays on Lenny's overeating). Her writing betrays a deep familiarity with language—not only how to understand it, but how to play with and break its rules. Eunice reads, and she reads well, even by the criteria of those who, like Lenny, bemoan the illiteracy of her generation.

Through her reading and writing both, Eunice puts human experience and human bodies in contact with a larger assemblage of other human and technical actors. In the process, she capitulates herself to this technical network so that her body may become data, thus aiding the efforts of dataveillance actors like the Bipartisans, or, in the real world, Cambridge Analytica. As noted above, Eunice's sections take the form of communications with her friends and family on the GlobalTeens social network, on an open forum that locates the "Standard Long-form English text" of her messages between the nodes of a network. Evidently in the thrall of her data double, Eunice prioritizes her textual interactions within the network, neglecting or actively seeking to eliminate her physical body. At a social outing with Eunice, Lenny notes, "She was using my forty-second pause to bury her head into her äppärät. What was I even doing with this sleek digital creature?" (153). In order to become the "sleek digital creature" that she appears to be,

Eunice must figuratively "bury her head," both by ignoring her physical surroundings and by suppressing the conspicuousness of her physical body in favor of the data self who reads and is read by the network. The consummate digital reader, Eunice repeatedly endeavors to make her real body disappear. Her disordered eating and close monitoring of her weight are designed to reduce her already underweight eighty-six pounds even further. Digital interactions actually take the place of nutrition: "Unloading about my life [on GlobalTeens] is like the only thing that keeps me from spending the day inside the refrigerator and adding to my FAT ass" (299). Even to Eunice herself, the data double functions to reduce the nondigital body, which in turn gives way to the textualized reading self.

As Eunice reduces herself to the digitized version of her body, she also becomes increasingly exchangeable, a data composite made of aggregates rather than individual traits and experiences. Especially to Lenny, Eunice is essentially interchangeable with other Korean women. He thinks of her alongside all of the other Korean girls he has dated, points out her "usual Korean" behaviors, and even recalls "one girl, another Eunice—a Eunice Choi" as the first in his long series of Korean crushes (128, 129). While Lenny's casual fetishization is neither out of character, nor unusual in its racialized assumptions, it highlights how Eunice's identity exists as data points of her self, data that is replicable, fungible, and legible. A reader of data, and a reader made of data, "Eunice Park did not possess the false idea that she was special" (328). The crux of Eunice's digital fungibility and legibility is her capacity to move data through herself as she reads and is read. Eunice reflects, "I feel like a recycling bin sometimes, with all these things passing through me from one person to another, love, hate, seduction, attraction, repulsion, all of it" (298). As in her love life, so in the world of data collection and digital reading. Eunice is the ultimate figure of the readable reader, the nexus for data streams that

collect her information in order to use it against her and others in the network for their various reading purposes—political, corporate, and otherwise.

Eunice does not try to hide from this regime, but as such she also becomes the only politically effective character in the novel, developing a political agency and subjectivity that is inaccessible to Lenny. Instead of hiding out, she inhabits the network in ways that take full advantage of the breadth and depth of reading activities available to her as a data body in a surveillance assemblage. Her reading practices are not countervailance in Raley's terms—"the appropriation of the technological tools of surveillance" for the purpose of resistance to dataveillance structures (133). Neither is her reading an example of Alexander Galloway's counterprotocol behaviors—explicitly "oppositional practices" designed "to instigate progressive change inside biotechnical networks" (98, 97). Instead Eunice's position within the network is more akin to what Patrick Jagoda calls "network ambivalence," a state of "extreme presence" within digital networks that uses the rules and logic of controlling data in order to critique those systems while remaining unreadably consistent with those same systems (114). Through complete acceptance of her role within these systems, Eunice has access to reading as a way to form political sentiments that run counter to the wishes of the corporate and state actors that control the infrastructure of the network, without fundamentally opposing that network. Her shallow reading, constant connection, and wide networked connections provide her with the facility to act through the networks channels in concert with other individuals located within its (all-encompassing) reach, rather than falsely believing herself to be outside of its grasp. Willmetts identifies her role as "a vision of autonomy that is at once in conversation with the social forces that made her and conducive to a politics of solidarity" (271). Eunice's active, networked reading connects her to political realities and communities that would be impossible

under protocols of retreat or outright opposition. In this way she inhabits her data double as a tactic of reclaiming subjectivity within a dataveillance society.

The daily reading practices that Eunice follows are fundamental to her political behaviors. Eunice reads widely, like a network, in that she samples texts from a large pool of contributors and aggregates this data into an interpreted and meaningful result that can be mobilized in various ways. All day long, Eunice reads lifestyle advice, shops online, and corresponds with a range of people and groups via the GlobalTeens platform. Her contacts include like-minded college friends, Lenny, his wealthy and eternally-youthful boss Joshie, her conservative friends in California, her Korean-immigrant parents, her activist sister Sally, and David, a veteran of the war in Venezuela and current leader of the resistance movement in New York. Eunice's indiscriminate, unceasing reading provides her with the data she needs to understand, as Cambridge Analytica does, the interiority of people—their motivations, and feelings—in the digital context where those feelings form and get expressed. Eunice performs acts of aggregation to interpret her reading and constitute her orientation toward these people and their data. Because the form of her reading—constantly sharing, constantly scanning, constantly surveilling—is consistent with the desires and expectations that the network has of her as a data subject, it is inseparable from the threatening operations of dataveillance even as it affords her with a means of education and human connection. In this way, Eunice is both an actor in the data assemblage (a data body through which text flows with little resistance) and a human reader whose personal political orientation comes about through her ambivalence.

This is not to say that the response to dataveillance systems should be centrist and/or non-responsive—though such a stance would certainly appeal to the Bipartisan totalitarian regime in *Super Sad True Love Story* and the data giants whose work serves similar political ends in our

world. Instead, it is out of this vexed position that Eunice develops her incisive political beliefs, beliefs which become actions through her textual relationships with other people. Though she does not overtly reflect on the influence of these different perspectives on her own thinking, their mark is obvious in the ways that she deftly grows as a political being. Eunice parrots the language that is expected of her as a reader of the Bipartisan's digital landscape. Her habits in this networked space, however, reflect subversive political feelings that she claims to be unable or unwilling to express. She is avowedly uninterested in "Politics" with a capital P, preferring Retail, Images, and Real Time Shopping, but Eunice develops eloquent opinions about the plight of "Low Net Worth Individuals," immigrants, and underserved veterans. Eunice's sister introduces her to the resistance camp in Tompkins Square, and afterwards, Eunice explains to her friend over GlobalTeens: "It made me sad because this is what their lives have become and just last year some of them worked in Credit or were engineers . . . And I thought, I wish things were better for you, *but we're not all in this together*" (146, emphasis added). At first glance, it may seem that Eunice is distancing herself from the individuals in the camp, but on closer inspection it becomes clear that this moment is actually a complex recognition of their relative positionalities. Over the next months, Eunice acts on the privilege that her class position gives her, gathering food, medical supplies, and old technology for the camp, and spending her time volunteering to do their laundry, support their medical needs, and spread the word. Even as her reading and writing uses the language and forms of the network and its state and corporate owners to uphold its mission of constant surveillance, Eunice is able to form meaningful political and personal feelings that translate into organizing against the data-driven regime.

However, although Shteyngart sets up Eunice as an optimistic figure of tactical action and resistance, her character's potential never fully materializes. Filtered through Lenny's biased

perspective, the novel continually disparages the reading practices that I am arguing are crucial sites for a nascent politicized orientation to digital networks and dataveillance. Eunice, as a fictional character savvy in this orientation, amounts to very little. At the end, she renounces her interest in political work, and goes on to date a series of wealthy men before disappearing from the narrative in the final chapters, when Lenny's perspective becomes dominant. This essay's reading of Eunice and Eunice's own reading practices thus both rely on the idea that in reading, something always escapes the structuring forces that demand that reading. Where my reading positions Eunice obliquely to the conclusion that Shteyngart writes for her, Eunice's reading practices likewise salvage political feeling from the coercive politics of dataveillance. In both cases, reading produces new meanings that are not fully legible to the originating system.

Under conditions of dataveillance, it is rarely possible to withdraw fully from legibility, but Eunice's reading practices nevertheless attempt to reorganize human relationships to the reading of surveilling machines. Andre Brock Jr. writes in *Distributed Blackness: African American Cybercultures* that "Black Twitter" functions as a "satellite counterpublic" that exists alongside and within larger public spheres including Twitter and U.S. technoculture by crafting its own protocols that are not easily read or adopted by the mainstream platform (86). While Black Twitter operates through Twitter as a platform that surveils, "Black users' employment of Twitter's rigid format to articulate Black discursive styles and cultural iconography subverts mainstream expectations of Twitter demographics, discourses, and utility" (Brock Jr., 111). It is the networked *presence*, rather than sequestration, of these counterpublics and their codes of reading and communication that makes them effective. Furthermore, the practices of "White Twitter"—what we might understand as the expectations of a "normative" reading and writing practice on Twitter—Brock argues, become visible through the textual practices of Black Twitter

(117). The textual forms of Black Twitter not only produce cultural identity that resist those of the dataveillance assemblage and its cultural demands, but also produces counterimages of the oppressing system.

The community of readers with whom Eunice engages in very specific textual practices operates similarly as it attempts to question the reading of surveilling bodies while continuing to flow without friction through surveilled systems. Eunice's reading under dataveillance, which operates in the modes expected of her as a data body, constructs Eunice as a skilled reader who can read herself, others, and the system in which she exists. At the same time, it produces the surveilling reading system itself as a subject of reading scrutiny. In my reading of the novel, Eunice emerges as a figure who leverages the reading and writing of unauthorized political feelings and solidarities to form counter-political feelings—to talk about politics without talking about them and thus to affiliate with different political collectives. She uses her position as a transparent, reading data body to pursue a quasi-independent agenda, in solidarity with other human readers, separate from that of the entities who wish to read her.

10. Reading Race in the Digital Body

Super Sad True Love Story, in the final analysis, offers an optimistic model for effecting political and other kinds of agency under digital dataveillance conditions that it ultimately undermines through the novel's tropes of "good" and "bad" readers and "savvy" and "luddite" Internet users. In particular, Shteyngart replicates longstanding racialized and gendered readings of technology in articulating a markedly white, male anxiety about the influence of dataveillance. *Super Sad True Love Story* constructs Eunice as the consummate digital reader, one who trades in ambivalence and readerly expertise in order to read and be read in networked spaces.

Shteyngart's representation of Eunice as predisposed to textuality, immateriality, fungibility, and technological expertise is hardly surprising in the context of enduring techno-Orientalist depictions of Asian bodies, and particularly Asian women, as naturally disposed towards the computational or robotic. As a "nano-sized woman who had likely never known the tickle of her own pubic hair, who lacked both breast and scent, who existed as easily on an äppärät screen as on the street," Eunice exemplifies the "Asian-as-technology, Asian-as-future" trope that Wendy Hui Kyong Chun identifies as a key feature of cyberpunk and other narratives of digital technology (Shteyngart 21, Chun 51). These descriptions go hand in hand with Eunice's problematic sexualization. The novel's critique of dataveillance relies on a certain troubling understanding of who should capitulate to dataveillance as a condition for co-existence with technology, and for whom full readability remains an indignity and a threat. As Chun writes, "The human is constantly created through the jettisoning of the Asian/Asian American other as robotic, as machine-like and not quite human, as not quite lived" (51). Through contrast with Eunice, the other characters of *Super Sad True Love Story* are able to assert their persistent, fleshy humanity as both under threat from and resistant to dataveillance and its challenge to "traditional" reading practices.

The characters of Lenny and Joshie are representative of a figure that is becoming common in fictional narratives of the twenty-first century's computing and data technologies. Both are eccentric white men whose exceptional, deteriorating bodies are foils to the sleek, Asian female bodies that populate their worlds. Lenny's sense of self is gravely threatened by the encroaching reach of data: he worries about the state of reading and literature as a sign of the state of the world writ large, and he worries about the ubiquity of äppäräts and his use of them. But his body—fleshy, big-nosed, middle-aged, hairy—resists these new conditions. As opposed to

Eunice's vanishing and fungible form, Lenny's body continually asserts its importance and incompatibility with the data world, clinging to its fleshiness even to the extent of planning to "re-grow [his] melting liver [and] replace the entire circulatory system with 'smart blood'" (5). Likewise, Joshie, who does not wear an äppärät, has so enhanced his body in preparation for eternal life that when the treatments prove dangerous, he is left a melting wreck of his former self. Eunice, Lenny, and Joshie find their counterparts in other recent fictions like *The Windup Girl* (Paolo Bacigalupi, 2009), *Ex Machina* (dir. Alex Garland, 2014), *Humans* (Sam Vincent and Jonathan Brackley, 2015–present), and *Oryx and Crake* (Margaret Atwood, 2003) in each of which female Asian bodies and Asian aesthetics make the easy slide into fungible data while white bodies resist or break down rather than succumb.

These white men's fearful attitudes towards the textualization of their bodies and selves extends as well to their reading practices, which cling to reading as a literary endeavor that is solitary, deep, tactile, and under threat. Lenny himself is insufferably elitist about his affinity for words. He marvels at the speech of children: "Language, not data. How long would it be before these kids retreated into the dense clickety-clack äppärät world of their absorbed mothers and missing fathers?" (53). Lenny's disdain for data, the textual form that Eunice and her peers use so deftly, reveals his discomfort with new kinds of text and reading. And in response to this anxiety, Lenny clings to his books as any good bookworm would. "'You're my sacred ones,' I told the books. 'No one but me still cares about you. But I'm going to keep you with me forever. And one day I'll make you important again'" (52). Joshie, though he claims to "hate reading too," quotes from Walt Whitman and is clearly well-read (296). The novel reserves "true" literacy and its connotations (intelligence, cultural capital, etc.) for its most humanized and individuated characters, the white men whose bodies cannot be reduced to text, even within the

data-oriented form of the novel. Reading sets them apart. Lenny clearly believes himself to be special.

However, because their reading practices give them the illusion of existing outside of the surveillance/reading assemblage, these characters are in fact less able to resist the efforts of the state and others to use their data to influence their behavior. Unlike Eunice, who "doesn't know much about politics," Lenny claims to understand the terror of the American Restoration Authority, their dictatorial practices, and the racial and class dimensions of their social control. But Lenny's familiarity and token opposition to these concepts, born of his reading habits, only provide him the illusion of operating outside of the network's control, and preclude any examination of his own role within the network that he refuses to acknowledge or join, despite that he already exists within it. When confronted with blatant examples of institutionalized state racism, the most Lenny can muster is "the perfunctory liberal chill at seeing races of human beings so summarily reduced and stereotyped" (54). As later becomes clear, Lenny has internalized the simple racial logics of the Bipartisans with regard to minority groups. His biases emerge most clearly in his approach to Eunice, whom he and the novel on Shteyngart's behalf bathes in an unrelenting, fetishistic gaze. Lenny believes that by not actively participating in the network, he can actually be outside it. He cannot.

Unfortunately, this is where the novel's sympathies lie. The novel, and Shteyngart, as confirmed in interviews, respond to the new landscape of data management by retreating into a nostalgia for pre-digital literary culture, and finally, at novel's end, into "silence, black and complete" (331). Shteyngart, it seems, would prefer to leave technology behind altogether, as he suggests in a 2010 interview: "as a value added product, there is nothing good coming from it," "the idea is that we are all uploading or downloading something important – and we're not"

(Interview with Carpenter). In Shteyngart's 2010 essay, "Only Disconnect," he describes himself as, like Lenny, a middle-aged Russian-American man who leaves a "book-ridden apartment" to wander the streets of New York with the company of his new iPhone. The essay crafts a fable of modern technology, describing Shteyngart's retreat to upstate New York where he can "wake up from the techno-fugue state and remember who I am." It ends with Shteyngart and his friends lounging around a campfire, iPhones tucked away in their pockets, "as we commune in some ancient way, laughing and groaning, passing around lighted objects and containers of booze while thoroughly facebooking one another for real in the fading summer light" ("Only Disconnect"). Shteyngart's desire to disconnect for a weekend is not a bad thing, necessarily, and neither is his diagnosis of some of the effects of too much "screen time." But his prose makes it clear that he shares Lenny's disdain for newer forms of communication, and that he would much prefer to exist in a world apart, "a world corporeal and complete, a world that doesn't need the press of my thumb." By the end of *Super Sad True Love Story*, Lenny also wants to return to a time when even with "the clatter and drone of the massive machine around me" he can still be "me, with my words, brilliantly alone" (274). This is Lenny at his most white: assuming he is not part of the machine, assuming he does not also drone and clatter, assuming that he, alone, deserves to be alone.

These racial and gendered dynamics of the novel further demonstrate Lisa Nakamura's central point in *Digitizing Race* that digital spaces do not neutralize the axes of power that operate on racialized and gendered bodies in nondigital spaces and societies. Even as dataveillance practices textualize these readable bodies, their experiences of surveillance—of reading and being read— are inflected by the data that identifies them in social and cultural

categories with their own long histories of reading and readability.[55] As Simone Brown explores at length in *Dark Matters: On the Surveillance of Blackness,* surveilling entities and infrastructures in Europe and North America have long been oriented toward tracking, tabulating, counting, and recording the lives of black communities. With the advent of new technologies for networked and huge-scale data mining and the disinformation it can advance, it is essential to examine critically how these patterns of surveillance can act through "the exercise of power cast by the disembodied gaze of certain surveillance technologies . . . that can be employed to do the work of alienating the subject by producing a truth about the racial body and one's identity" based on a textualized, data body (Brown 110). During his Senate Judiciary Committee hearings, Cambridge Analytica whistleblower Christopher Wylie revealed that the firm specifically targeted black voters in the U.S. as vulnerable communities who could be discouraged from voting (Solon). While black voters were not the only recipients of Cambridge Analytica's attention, the oppressive intersections of surveillance, data privacy, and race are clear.

Super Sad True Love Story's approach to the application of dataveillance replicates some of these same assumptions and structures—in service of both satirizing and reinforcing them. As racialized and gendered characters, Eunice and Lenny illustrate how representations of data, digital technologies, and surveillance must address the historical and ongoing ramifications of race, gender, and other markers of identity. The novel describes digital reading practices within a

[55] For more on the intersections between technology, algorithmic systems, and race, see Ruha Benjamin's *Race After Technology* and Safiya Noble's *Algorithms of Oppression.* Benjamin explores how the "New Jim Code" literally encodes patterns of racism into emerging technological systems. Noble explains how the algorithms that power search engines and other platforms privilege whiteness and discriminate against people of color due to the limited scope and private interests of the companies that produce these tools.

dataveillance society that produces data people who read and are read in service of the data collection entities with a stranglehold on digital infrastructure. But its depiction of this problem depends on the Orientalist and misogynist tropes that have long characterized discussions of technology in cyberpunk and speculative fictions. Retreating into the safety of literary reading allows Shteyngart and other writers to project fears about digital legibility onto female, Asian bodies while protecting white, male protagonists from this undignified fate. As a case study, then, *Super Sad True Love Story* both gestures towards the potentials of digital reading and also offers an illustrative picture of continuing problems with how digital reading is conceptualized in literary and non-literary contexts. In these fictions as in real life, the full expression of humanity irreducible to a readable text, a humanity that can be opaque but not thereby criminalized, is limited to white men. Their treatment of characters and aesthetics are akin to Cambridge Analytica's assumption about who should be readable (everyone, but especially racial and other groups who are most vulnerable to it) and who does the reading (white men, tech bros who drink raw water, and Donald Trump—exactly the kinds of rich, white, eccentric men we see in these stories). Even so, against the reading practices of big data, including firms like Cambridge Analytica, government surveillance organizations like the NSA, and the digital platforms that control our experience on the internet, like Facebook and Google, it is essential for humans navigating online spaces to become good readers of digital networks. While it may sometimes be possible to entirely mask online presence and identity, doing so cannot be sustainable for the growing global population of digital network users. Instead, we must cultivate modes of reading that parse the machine reading of the dataveillance system in order to reclaim our data and, with it, our selves.

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4. Artificial Imaginations: Nonhuman Readers and the New Weird

Ken Liu's short story "The Bookmaking Habits of Select Species" (2015) describes the reading practices of a number of extraterrestrial civilizations, each of which engages in some kind of book art or writing craft. Among these are the Caru'ee: tiny beings who build their cities in the discarded books of other civilizations. They literally inhabit ancient Incan counting strings known as quipu, build in the grooves of clay Linear A tablets, and tunnel into the water-inscribed brain stones of another alien species. Their built environments, unknowingly, mirror the original writings of these found book artifacts: markets in the strands of the quipus, laboratories in the experimental brain stones, and entertainment centers in the magnetic fields of old discs, where "long-dead data illuminated the dance of thousands of young people searching for love, seeking to connect" (8). Unconsciously, the Caru'ee perceive the necessary relationships between form and content, interpret it, and enact that interpretation through an architectural and social writing of their own: "They read without knowing they are reading" (9).

Liu's vision of the microscopic Caru'ee and their bookish world-building habits is an apt symbol of the work that nonhuman readers do already—or may do in the future—with human works of writing. In the early-twenty-first century, beings like these are at work in the world: like the Caru'ee, similarly unknowing, ingenious and invisible Artificial Intelligence (AI) systems are part of devices, infrastructures and other technologies in every sector of modern life. The natural language processing (NLP) algorithms that process our writing in digital systems do not understand what they read in the same way that we do, and yet perform tasks that have the appearance of such understanding. NLP systems are those that can process natural language—the language that humans use in everyday applications like speech and writing (e.g., English or Japanese) as opposed to formal languages used for computer programming (C+, Python, or

JavaScript, for example). NLP tools perform a variety of reading tasks (mining, searching, tabulating, tokenizing, predicting, etc.), that may or may not yield what we recognize as semantic understanding on the part of the machine. Full natural language understanding is still unrealized—solving for this problem would require developers to create AI that are as intelligent (meaning as flexible, knowledgeable, and creative) as human beings when encountering a new task they have not specifically trained for. But though this kind of AI is still beyond us, NLP technologies are already everywhere: they live in our smartphones, where they run predictive and autocorrecting keyboard systems, power search engines, automate translation tools, collect our data, and report to organizations such as Google, the NSA, and Cambridge Analytica. They write sports articles, produce financial reports, make sentencing recommendations to the justice system, plan flight paths, and much more (Moses). NLP reading has far-reaching and grave consequences, especially for vulnerable and marginalized communities who have always borne the brunt of irresponsible technological exploitation. But for the most part, Natural Language Processing systems are invisible to us, and difficult to explain or portray. For the most part, we are not attentive to their presence, much less their processes and the impacts of their incessant, machine reading behaviors. This chapter begins from an interest in the current as well as the speculative systems that will perfectly imitate and exceed human reading capabilities. NLP systems can be deployed for almost any purpose in any context, but here I focus on the ones that are present in consumer technologies like mobile phones, internet browsers, and web platforms. My aim here is to show that the NLP activities in these technologies are reading processes with their own affordances and limitations—ones that human readers must respond to with care.

Though AI have been well-represented in literature and film, especially science fiction, depictions of AI systems that engage in activities recognizable as reading are more rare. Liu's story about reading aliens, at least one species of which is mechanistic, is among relatively few representations of nonhuman readers in literature and film. Mary Shelley's *Frankenstein* (1818) features a human-created, artificial being who learns to read literature and history as part of his development into a sympathetic, human-like character. More explicitly machinic readers include the android Data from *Star Trek: The Next Generation* (1987-1994) who enjoys reading poetry and "holonovels" (especially *Sherlock Holmes*), and can process text at an incredible speed. The HBO series *Westworld* (2016-2020) features human-passing androids who sometimes appear to read as a pastime, and who, in the show's second season, gain access to a "library" of human data, presented as rows of leather-bound books with text that resembles a player piano roll. These are indeed reading robots, but their anthropomorphism marks them as beings who, though artificial, readers and viewers are meant to understand as contenders for humanity. Their reading, therefore, is often meant to augment our sense of their humanity, rather than represent a particularly machinic reading process. Moreover, these various visions of sentient machines do not much resemble the AI that actually suffuse contemporary information technology. Today, AI are mostly invisible, or at least embedded within the black boxes of our personal digital devices, not walking around with human faces.

Nonanthropomorphic readers are even more rare, however: examples of computers who read are uncommon—mostly because their reading goes unremarked as such. One such reading machine is the sentient Linotype machine from Fredric Brown's "Etaoin Shrdlu" (1942), which learns from everything the typists set in the machine. It subsequently tries to take over the world but is foiled when the typists feed it Buddhist philosophy about nonviolence. In Richard Powers'

novel *Galatea 2.2* (1995), the artificial intelligence system "Helen" learns about human nature when her human operator reads literature and philosophy to her. She shuts herself down after learning about hatred and war. Though these literary examples look more like the AI systems operating in the twenty-first century, their modes of reading and logics of interpretation are for the most part similar to that of human readers. Real-world AI do not read like us. They do not often give us access to their reactions to human literary culture. And in the not-too-distant future, AI will take on forms that we can scarcely imagine as more and more infrastructure and development around the world is relegated to the care of automated systems.

As Nora Khan suggests, new metaphors for Artificial Intelligence that more accurately capture the qualities of these entities will allow human communities to better imagine and respond to the developing technological environment (1). Rather than relying on received tropes of robotic humans or humanlike robots, such new paradigms would "help us produce new and ecstatic modes of thinking and feeling, speaking and being . . . they enable a type of cognitive exercise and practice, for redirecting our attention towards the strange, for constructing spaces of possibility, and for forming new language" (Khan 6). A redoubled critical effort to understand the actual processes of AI operation, including AI reading, will illuminate how these beings are neither agentless tools for human work, nor conniving almost-humans who seek to usurp humans as the dominant species. Khan's argument is that AI are neither solely tools nor quasi-humans; they will instead have both capabilities and motivations that are inscrutable to us. To engage with such beings, we need new tropes that allow us to explore the actual workings of artificially intelligent systems.

In this chapter I approach the problem of Natural Language Processing AI through Jeff VanderMeer's novel *Borne* (2017), where machinic and other modes of reading compete as

alternative strategies for making sense of the world. In this novel, the monstrous AI take the form of biotech creatures that are neither comfortably familiar nor entirely strange. The reading that these artificial beings do is often dangerous and violent—at odds with the humans who endeavor to read with the AI and whose words the AI in turn read. Like the inscrutable entities that Khan predicts, the readers in this novel engage in reading practices that are impossible to explain through received tropes about robots and devious computers. Instead, VanderMeer's strange creatures challenge us to expand our understanding of artificial systems and reading alike.

Borne takes place in the "City," a post-apocalyptic landscape where human, animal, and biotech hybrids scavenge and struggle for survival in the wake of the departure of a biotech firm named the Company. One such scavenger, Rachel, finds a sea anemone-like creature that she names Borne and takes home to her partner, Wick. An amateur biohacker, Wick determines that Borne is some kind of biotech—likely castoff from the Company. Borne develops rapidly, learning to speak, move, read, and more in Rachel's care. As he grows, the City becomes more volatile under the competing reigns of two figures: Mord (a giant, flying bear) and the Magician (a violent biohacker who heads up an army of orphaned, genetically altered children). In this volatile environment, Borne, Rachel, and Wick must decide how, or if, they can continue to live together in peace and safety.

Many of VanderMeer's fictions have been read as narratives of environmental collapse and resilience—tales of revolting ecology for the Anthropocene, when the effects of anthropogenic climate change are on full display, along with the dislocating epistemological shifts this era might demand. And indeed, the blasted, polluted landscape of the City is readily available as a warning against the convulsions of a planet in crisis. To tackle issues so large and so strange that they cannot be seen completely, the text dwells on that which cannot be fully

described or understood. This penchant for the unexplainable is a hallmark of the "New Weird," a narrative style that VanderMeer has helped to define (as co-editor with Ann VanderMeer) of two anthologies of Weird and New Weird stories.[56] In the introduction to the Weird volume, they write that the Weird "strives for a kind of understanding even when something cannot be understood, and acknowledges that failure as sign and symbol of our limitations" (xv). In the New Weird, alternatively, "the starting point is the acceptance of a monster or a transformation and the story is what comes after" (x). Such a premise, in which the unsettling, grotesque, and frightening is a given, involves a complete "surrender to the weird . . . without ironic distance (xii). The weird in these texts is not something to be explained or illuminated, but a fundamental rupture in the horizon of possibility for conceptualizing the world. Gary Ulstein similarly describes the weird as "fiction that tries to think the unthinkable" (81). The New Weird is a style of genre, then, that confronts the unknown not with the penetrating logic of realism, but a hedged and limited belief in human ability to comprehend (or the prerogative to do so). This, I argue here, is a necessary attitude for reading AI that read.

The weird is that which remains unknown even after we encounter it. It challenges readers ability to categorize and understand. What better contemporary form of fiction for confronting the weird entities of artificial intelligences who read? These systems, tools, or beings are situated in a liminal place between tool and system, system and being. They carry out tasks

[56] The New Weird grew out of Weird fiction, a late-nineteenth- and early-twentieth-century genre of speculative fiction associated with writers such as H.P. Lovecraft, M.R. James, and William Hope Hodgson. Weird fiction presented unsettling and fantastic visions of the supernatural to provoke awe and "remind readers of the strangeness of the world and the limits of our understanding of it" (VanderMeer and VanderMeer, *The Weird* xvii). Compared to the Old Weird, the New Weird often includes more formal experimentation, visceral descriptions of grotesque horror, and tends to take place in realistic, urban settings (VanderMeer and VanderMeer, *The New Weird* x).

of reading without human assistance—an activity previously exclusive to human beings. But their architectures and motivations are decidedly nonhuman. At the same time, these entities appear seductively human in their interactions with text, and with people. They already exist, but we can hardly see them. Instead, like the weird subjects of VanderMeer's fiction, they present a challenge to the human capacity for understanding.

In their various weirdness, the other hybrid beings in *Borne*, and especially Borne himself, must negotiate between the different modes of reading available to them: machinic or organic, ruthless or kind, complete or unresolved. In the process, they expose some of the limitations that these modes of reading produce when they begin to suffuse everyday life in digitally-saturated societies. This chapter focuses on NLP technologies that are currently being deployed in our intimate digital lives: the ones that read all kinds of written material, digest and batch those texts, and report this reading back to centralized data servers. These reading machines now suggest restaurants, predict emails, recommend products, prefill text messages, and much more in order to organize our lives in variously helpful and intrusive ways. I here argue that Natural Language Processing systems are designed to consume text by eliminating syntactic, semantic and cultural difference in pursuit of clarity and conformity. In computing terms, this kind of reading is "lossless"—no data is distorted in the process of transmission from the origin to receiver. Such reading is certainly efficient, but ultimately risks consuming that which it reads in the pursuit of conformity with the requirements of machine readability, tending not to losslessness, but in fact absolute loss on the part of the human beings that are read by NLP AI. To counter this issue, I identify a model of "lossy" reading in *Borne*, reading that values distorting noise and idiosyncratic specificity out of care for that which we read. Ultimately, when

reading AI, we must be careful not to read like AI do, but like the astute and careful readers that we are capable of being.

1. *Borne* and Biotech Reading

At the outset of Vandermeer's 2017 novel *Borne,* Rachel finds the titular character nestled in Mord's fur, takes the creature home, and begins referring to the being as a "him" soon after. At first Borne is not responsive, but quickly begins to move, speak, and interact with his surroundings. In appearance, Borne is flexible: his rubbery flesh can change colors, stretch and contort like putty, but he often favors a shape like "a large vase or a squid balanced on a flattened mantel" (43). This description is repeated multiple times in the text, each time noting that Borne's shape could be either a vase or a squid, but never deciding on one or the other. Rachel's aesthetic indecision paints Borne, like some areas of the City, as neither "dead nor alive, but contested between the animate and the inanimate" (154). Borne is neither concretely technological, nor entirely biological. In Borne's own words: "I was made by someone. I am not actually alive. I am a robot. I am a person. I am a weapon. I am not/intelligent" (190). Borne's indeterminate biological and sociocultural positions—between the technical, biological, animate, and inanimate—makes him a useful figure for thinking about AI, which is likewise a tricky species. Similar to AI, Borne's status as a thinking being is also contested. But like the people he models himself after, Borne reads quite a lot. As he becomes more curious about the world, Rachel seeks out ways to satisfy his endless questions:

> Which brought me quickly to the idea of teaching Borne to read, except he picked that up on his own. When we played hide-and-seek, I'd sometimes find him hunched up on the edge of a midden of discarded books, two tentacles extending out from his sides to hold a

book and a single tentacle tipped with light curling down from the top of his head.

He would study any number of topics and had no real preferences, his many eyes enthusiastically moving back and forth as he read the pages at a steady clip. I don't believe he needed light, or eyes, to read, but I know he liked to mimic what he saw me doing. Perhaps he even thought it was polite to seem to need light, to seem to need eyes. (52)

Rachel recognizes the appearance of Borne's reading as one that is similar to human reading: scanning across the page, using light and eyes to take in the words. But the procedures and results of Borne's reading differ from those of human reading, as Rachel suspects. When Borne claims to have "already read all of the books in the Balcony Cliffs," the building where they live, Rachel is confused (145). Where are the books, then? she asks. Borne responds: "Oh, the stacks and stacks and stacks. No one needs the clutter. So much clutter. So many things to trip over. I have remembered it all. I read it all. I read everything" (145). This is Borne's endearing but evasive way of explaining that he literally eats things in order to "read" them: his appearance of scanning the pages like a human being is only appearance, and his actual process of reading involves absorbing the physical texts into himself. The books that Rachel has gathered for him, all of the knowledge they contain, are now literally part of Borne's body, a nebulous shape that "nothing ever comes out of" despite how much he eats—he is "the most efficient creature [Wick has] ever seen" (82, 83).

Borne's reading habits might only be a harmless, and efficient, quirk, if he stuck to written materials. But as soon becomes clear, this form of reading extends not only to books and other textual objects, but also to other living beings. After a group of feral children attack Rachel, Borne retaliates, killing and absorbing them into himself. Through this act of violence,

Borne insists, “I know them now. I know them,” and the process makes him “more complete” (46). As with the books, Borne’s process of gaining knowledge involves absorbing the object of knowledge into himself in order to understand it—making himself bigger and eliminating the original text or body. He likewise devours all of the lizards, spiders, and other living creatures in the apartments, gaining knowledge and capabilities as he does. Later, Borne again links his actions explicitly with reading. The dead bodies that he hangs up on his walls as decoration are definitely not alive, he says, because there is “nothing to read in them” anymore (143). So Borne conceives of both his literal reading of texts and his absorption of other beings as reading behaviors that yield knowledge. Borne’s reading mirrors the textualizing reading of data surveillance entities that Chapter Three discussed, where large data systems such as Google, Facebook, the NSA, or Cambridge Analytica read human beings in order to reproduce them as data bodies. The macro-level data infrastructures that handle our data assume that we are readable texts to be collected, processed, and interpreted, just as Borne treats almost all matter as readable material. As in *Super Sad True Love Story*, this systematic reading of human beings has consequences for whether those read subjects can access their full subjectivity within the reading-surveillance assemblage.

Borne’s reading processes are monstrous: his insatiable appetite for that which he can swallow eventually pushes Rachel to recognize that Borne cannot stay with her and Wick lest he eat them too. VanderMeer’s depiction of this biotech creature helps us to imagine a mode of machine reading that is similarly violent. As a model of machine reading, Borne reveals how reading can be dangerous: how it can consume as a condition of understanding. Borne’s mechanism for and understanding of reading makes literal the tropes of “consuming” media and “devouring” books. That Borne consumes in order to read opens up new avenues for thinking

about how NLP also consumes in its approaches to harvesting, classifying, and processing text. His reading methods might help us to see how these technologies counteract difference and surprise as a matter of course, and recharacterizes familiar AI NLP as dangerous, violent, and hungry. Reading *Borne* as a fictional lens on NLP systems in turn sheds light on how "weird" NLP systems can be—how they resist our knowledge practices even as they attempt to read and reconstruct those same practices. Confronted with such a dilemma, Weird fiction's commitment to the weird allows us to also imagine possibilities of critique that do not simplify the problem.

2. Natural Language Processing and Lossless Reading

Natural Language Processing systems first emerged in a post-World War II atmosphere of optimism around computational solutions to human problems, including NLP, and Machine Translation in particular. In 1957, linguist Noam Chomsky published *Syntactic Structures*, which argued that language should be understood from the inside out, by recording syntactic structures as a system of rules. Chomsky's approach to language had a catalyzing effect on NLP research, which sought to encode such rules in order to instruct a computer in processing natural language. NLP researchers created systems that ran on hard-coded rules in limited domains, following Chomsky in attempts to establish underlying grammatical principles in order to produce a language system. These efforts produced a number of notable early successes. One example is the ELIZA system, created by Joseph Weizenbaum in 1966, which produces responses representing a psychotherapist in response to user input.[57] For the time, ELIZA and other advances in NLP represented significant advances in machine reading. Researchers were hopeful that within a few years, full Natural Language Understanding would be possible. In 1966,

[57] To access an implementation of ELIZA, see https://www.masswerk.at/elizabot/.

however, the Automatic Language Processing Advisory Committee (ALPAC) released a report outlining the disappointing advances in the field, which they deemed insufficient and too expensive. Funding for NLP research dried up across the United States, and advances in NLP slowed.

Though many research directives disappeared or slowed as a result of the ALPAC report, important systems still emerged. Computer scientist Terry Winograd's SHRDLU, developed between 1968–1970, was a system that could identify and perform tasks on virtual blocks given natural language commands in that limited domain ("How many blocks are cubes?" or "Which block is between the green and red ones?").[58] SHRDLU ignited a new wave of optimism, but other teams had very limited success when attempting to create systems with wider areas of competency. Outside of a constrained domain, it became unwieldy to write the branching, individual rules required for systems to handle language in a wider context.

In the 1980s, however, new statistical approaches opened up fresh avenues for NLP research. Abandoning Chomsky's dictum that language systems must be built from internal structure outward, these new approaches used corpora of natural language to develop statistical models of actual language use. Systems could be fed training data (that is, natural language texts) in order to "teach" them the statistical relationships between words and other syntactic or semantic units. The operative method was often the N-gram, a concept that breaks a text up into units (grams) of length *n* that the system uses to predict the *next* n-gram based on the most probable sequences. This statistical approach, combined with new methods in deep learning, the availability of copious training data via the World Wide Web, and renewed interest in NLP along

[58] See Winograd, *Understanding Natural Language* (1972)

with the boom in consumer and commercial digital tech in the 1990s and 2000s, mean that NLP has become a robust and common feature in many tech applications.

The development of neural networks in the late 1990s and 2000s as an architecture for machine learning and statistical processing meant that NLP systems could create and identify much more sophisticated relationships between the linguistic units of a text,[59] and thereby perform more accurately in a wider range of tasks. In 2011, IBM's "Watson" system used NLP capabilities to compete (and win) against Jeopardy contestants in a special episode (Ferrucci 59). The task required Watson to parse input text (the often-cryptic Jeopardy clues), correctly interpret the question, search its database of knowledge (including the entire text of the 2011 Wikipedia and millions of other documents that Watson had been trained on), and produce a linguistic response in the correct format. Sophisticated, multi-layered tasks like Watson's question answering capabilities are now common.

Apple's Siri, Amazon's Alexa, the Google Assistant and other virtual assistants are perhaps the most visible versions of NLP systems in 2020, and the most recognizable as AI, since they project "personas" that we associate with film and literary representations of AI that simulate human consciousness. Most NLP AI systems do not look like these flagship AI, however, but rather perform tasks quietly in the background or as part of other applications that we do not recognize as AI systems.[60] But the diversity of activities that Siri, Alexa, and Watson can engage in point to the many tasks of NLP AI systems: question-answering, knowledge retrieval, speech recognition, part-of-speech tagging, search engine, cataloguing, data collection,

[59] Most NLP systems in the 2000s and 2010s relied on recurrent neural networks (RNN), and (since 2017) Transformer architectures: systems that allow NLP systems to iteratively assess an entire text as they read on (Goldberg 345).

[60] The "AI effect" states that once an AI process becomes routine/widespread, it is often no longer considered "intelligent" enough to count as AI.

filtering, which are essential parts of the many applications for NLP systems. The question-answering architecture of Watson's system, for example, is now used as a diagnostic tool for nurses managing cancer patients (IBM). Governments and corporations use NLP tasks to manage their data collection and analysis operations, like those outlined in Chapter Three. But NLP is also happening in the most mundane of places: predictive text in keyboards, search engines, spam filtering for email, music streaming recommendations, spell checkers, and more. Often developed within or with the support of major tech companies, these applications use the same skills as Alexa, Watson, etc.; their reading is just as—if not more—important and pervasive.

Though Natural Language Processing has transformed dramatically from its origins in hand-written flowcharts to the deep learning techniques in use today, the original assumptions of the early researchers have continued to shape the field's approach to processing natural language. The possibility of natural language processing machines grew out of Claude Shannon and Warren Weaver's influential book *The Mathematical Theory of Communication* (1949), which describes a mathematical model of communication that became the basis for information theory. In Shannon's first articulation of this model (published in the 1948 *Bell Systems Technical Journal*), a communication system can be represented as the input message, interfering noise, and the received message, as below (Shannon and Weaver 5):

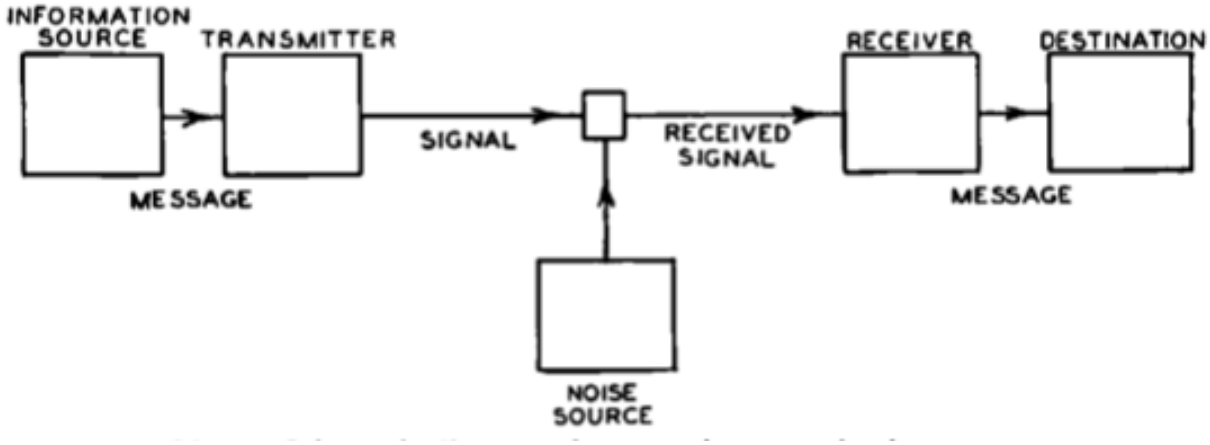

Figure 5: Shannon's communication system

The "noise" that interposes itself between sent and received message is the focus of this section. Shannon's theory of noise emerged out of a telecom engineering perspective: Shannon worked for Bell Telephone Laboratories, and his concept of the "noisy channel" referred primarily to a telephone line in which noise is the static or distortion produced by the imperfect technology of transmission. Removing this undesirable noise was a self-apparent goal: "Some of this information is spurious and undesirable and has been introduced via the noise. To get the useful information in the received signal we must subtract out this spurious portion" (Shannon and Weaver 19). Literary and cultural critic Roland Barthes, adapting information theory to semiotics and literary studies, by comparison, would later privilege noise as the desirable content of art: "we see that literatures are in fact arts of 'noise:' what the reader consumes is this defect in communication, this deficient message" (Barthes 145). This perspective is familiar to those of us in literary studies for whom the uncertainty, ambiguity, and "noise" of a text have been defined—from the New Critics to poststructuralists such as Barthes—as constitutive elements of literary texts and professional reading and interpretation of them, rather than defaults to be removed.

As N. Katherine Hayles explains, however, Barthes' conception of noise is actually quite similar to Weaver's original definition (Hayles, "Information or Noise?" 134). In the introduction

to Shannon's theory, Hayles points out, Weaver draws a distinction between "spurious" information introduced by noise and the "desirable uncertainty" produced by the "freedom of choice" in a sender's message (Shannon and Weaver 19). Weaver recognized that there were "perturbations or distortions of meaning which are not intended by the source but which inescapably affect the destination" (Shannon and Weaver 26). This acknowledgement introduces the idea that a message is not entirely the *intended* message of a sender, but is comprised of the *whole* of the message—noise and receiver's interpretative quirks included. Weaver's interest in the semantic, social, and even philosophical implications of Shannon's technical schematic matches what Hayles calls the "radical interdisciplinarity" of early information studies, where a term like "information" could bounce between disciplines in surprising and productive ways (Hayles, *How We Became Posthuman* 51).

Even in this foundational text of information theory, then, the central concept of "noise" is a multifaceted one. As the interdisciplinary atmosphere of early communication studies suggests, designing a Natural Language Processing system is not merely a technical issue, especially given the admission that noise—and not binary clarity—is a fundamental feature of language and communication. Ignoring this interdisciplinary literature on communication and noise, however, NLP has been treated primarily as an engineering problem to be solved by technology research and development. As a result, technical solutions to NLP have favored and continue to favor a view of noise as undesirable, as if the natural language communications between human interlocutors are merely corrupted versions of platonic, eminently machine-readable messages. In 1950, just a year after Shannon and Weaver's seminal text was published, John Stroud warned of the dangers of "automatically call[ing] all of the remainder of the received message the 'not' signal or noise" (qtd. in Hayles, *How We Became Posthuman* 63).

Stroud was concerned with, as Hayles points out, the "conservative bias" in Shannon's theory "that privileges stasis over change . . . The structure of the theory implied that change was deviation and that deviation should be corrected" (63). And for the most part, Shannon's narrower view has won out. As I show below, the trajectory of research and development in NLP AI has remained committed both to eliminating noise and to an ideal of stasis.

The basic challenge of NLP is to take the noisy mess of natural human language and turn it into something machine readable—something akin to a formal language in which each symbol corresponds neatly to a single function so that tools with NLP components can provide accurate and seamless service to users, whether these are individuals or entities with an interest in user data. "Noise" in natural language might include not only errors in syntax or spelling, but also unknown words and phrases, or complex meanings that are unclear to the system. As in Shannon's original model, today's applied strategies for eliminating noise in natural language stem from two assumptions: 1) that there is a perfect and original meaning that precedes any use of natural language, and 2) that the noise itself is an error to be corrected, rather than a constituent element of the communication. Both assumptions privilege the concept of *lossless* communication, wherein data can be transferred without loss of meaning or corruption. Lossless technologies are opposed to analog technologies or low quality "lossy" digital communication where data deteriorate with every transfer. In data terms, loss does not refer only to things that are eliminated from the data during transfer or compression, but also "artifacts" that are added in the process (random data that results from corruption). We can understand loss as analogous to Shannon's "noise"—distortion of data that includes both deletions and additions.

This model of lossless communication in NLP comes from communication theorist Warren Weaver's influential 1955 essay on translation. Literary and computational critic Warren Sack traces this lineage and its far-reaching influence in *The Software Arts*, where he argues that a novel interpretation of the concept of translation forms the basis for computer science's treatment of language. In the 1955 essay, Sack says, Weaver proposed that machine translation would be possible by modeling translation in a way it never had been before: as an activity of encryption and decryption. In this version of translation, a foreign language text is just an encoded version of the target language text and must be decrypted in order to be understood (10). This is counter to humanistic understandings of translation as an art of *movement* or *carrying over (*from the Latin *translatio)* from one language to another, so that any act of translation brings a reader to different place than where they began (Sack 14).[61] In contrast to this tradition and sense of translation, the decryption model of lossless transfer assumes that the end result of translation must be identical with the source material, such that any deviation is punished or processed into submission.[62] There can be no loss—and by extension no transformation—permitted in this context, where the ideal end is perfect equivalence between original source and received message.

Weaver's reflections on machine translation have influenced not only models of linguistic translation since the middle of the twentieth century, but also engineering ideas of "translation" between natural and machine-readable languages: the defined task of natural language

[61] For more on translation as art, movement, and political orientation, see Raley, "Machine Translation and Global English" 293-294.

[62] Google Translate is an example of this kind of machine translation. The service's many failings are well documented, but it is also interesting to note that when it encounters a word that does not fit into a given translation, Google Translate will often merely omit the unknown word from its output translation.

processing. In order to avoid loss, NLP must deal with the "noise" of ambiguity: manage natural language such that its features become clear and consistent with what is already readable. Through a variety of programmed processes, uncooperative data is transformed to support the statistical operations that make NLP possible. In other words, in pursuit of lossless reading, an NLP system must either ignore or resolve ambiguity. Often, unknown words are assigned a single label such as "<unk>" that represents an unknown value—in this case the system ignores ambiguity by relegating all anomalies to a single category, rendering them unreadable (Manning 199). Unknown elements that cannot be assimilated are irrelevant: useful only to be labeled as such and dismissed. By such parameters, an NLP system relegates all unknown words to the same category, and in order to be processed, they are thus altered to suit the expectations of the model. In the process of "smoothing" text data so that it can be processed, NLP algorithms may use stemming (indiscriminately chopping off the ends of words to arrive at their "root")[63] or lemmatization (which takes morphology and pretrained vocabulary into account before transforming the word). Though lemmatization is significantly more nuanced and accurate, it requires a much more sophisticated model, and therefore is not always feasible. In both cases, unfamiliar forms and the specific nuance of words and texts are lost. More recently, methods for approximating the meaning of unknown words have emerged that rely on morphological features and the meanings of surrounding words and clusters.[64] These techniques for dealing with the unknown have superficial similarity to the way that humans apprehend and incorporate new

[63] e.g., "organize" and "organic" may both become "organ," which may be etymologically sound, but distort the meaning of the text.

[64] See Pinter at al., Luong et al., and Yu et al for more on word embeddings. Koehn et al. show that neural network machine translation systems tend to substitute known words for unknown ones, a solution that creates syntactically sensical translation, but ones that are completely inappropriate for the context (32-33). The drive to eliminate the unknown here is so strong that it actually derails the system's ability to complete its tasks competently.

words as well—by inferring meaning based on context, related vocabulary, and known information. In the case of NLP, however, the goal is to pin down meaning and fix it to one single signifier/coded node, as in a formal language that brooks no multiplicity.

An even clearer example of this imperative to eliminate ambiguity emerges in the NLP mechanisms for parsing metaphor—and also in the language of research about these processes. In order to parse the figurative potential of metaphor, NLP must eliminate the proliferation of lexical difference and cognitive surprise that this trope effects, consuming the metaphor in the process. Even within more complex systems, metaphor processing in statistical NLP focuses on distilling a single, literal meaning, or single, logical conceptual path from a metaphor. Metaphors are some of the most ubiquitous features of natural language. By one measure, a metaphorical use of language appears on average in one of every three sentences in general language use (Shutova et al., 2013 302). And, as the long history of thinking about metaphor in literary studies, linguistics, rhetoric, cognitive science, and philosophy have shown, a metaphor is a complex thing. NLP researchers Veale et al. explain, "No matter how detailed our paraphrase, a metaphor always holds out the promise of more—more detail, more mappings, more associations—if we would only deepen our search" (13). And yet, from early theoretical models to recent computational accounts, metaphor processing in statistical NLP limits a metaphor's potential for "more" by privileging the ideal of lossless model of communication in which metaphor is only a messy conduit for some underlying, machine-readable code. Computational metaphor studies describe metaphors as "fantastic creatures" to "recapture and put into the zoo," or, alternatively, as linguistic features to be "harvested and classified" (Bolognesi and Despot 2). The work of Rei et al. describes methods for metaphor "detection," "capture," and "grasping" (1537). And even Veale et al., who recognize the perpetual "promise of more" *meaning* that a

metaphor provides, outline "corrective" strategies to "diagnose and repair" metaphors, "analogical" strategies for "systematic mapping" of metaphor, and "schematic" strategies that locate a metaphor within a "general metaphorical schema" (33). The metaphorical language that these researchers employ to describe their work here casts metaphors are things to be fixed in place, labeled and stored.

While these NLP researchers also articulate the complexity of metaphor as a linguistic device, the goals and methods of their work necessarily treats metaphor as an aberration in an ideal, clear language. But as scholars of literature have long known, the difficulty of pinning down metaphor is essential to its mechanism for producing meaning. Metaphors allow meaning to proliferate in any number of directions based on the difference between the vehicle and tenor, which are necessarily different, and thus imprecise. For example, Rei et al. describe "harvesting" linguistic units like food to invoke an act of collection, but their use of the metaphor also invites questions about the ways in which figurative language might be planted, grown, controlled, domesticated, sold, bought, eaten, inspected, processed, seasonal, sustaining, delicious, industrialized, and so on. As in this instance, metaphor creates expanding webs of meaning that invite interpretation—in literary texts, everyday language, and computational linguistics research alike.

And yet, NLP must treat language like Borne treats the bodies in his world: as text to be captured, consumed, and lodged in a database (or, in Borne's case, the consuming AI's body). The story of Borne reveals a problem in computational metaphor research: a metaphor that is "captured" or fixed can no longer act as living language circulating in and across cultural contexts once that captured version is deployed as the master key in the original text or new applications. More pointedly, NLP approaches to metaphor, like NLP approaches to many

problems of natural language, strip ambiguity, nuance, and difficulty from that language in the pursuit of lossless communication. When Borne reads (or eats), his texts and objects become fundamentally altered so that they can be assimilated into Borne's system. Rachel and Wick recognize this behavior as killing, but Borne insists that in absorbing his prey no harm comes to them, that nothing is lost: "I don't kill," he insists, "I absorb. Digest. They are all alive. In me" (185). As he archives texts (and people) like NLP archives metaphors, Borne does not recognize his reading as violent. Partially, this stems from Borne's own mythologizing of his behavior—his struggle to view himself as a "good" person features prominently in the novel, and for a long time precludes the admission that he kills. But regardless, his insistence that his read objects are still "alive" is telling. Borne conceives of his reading as a lossless activity—he does not recognize that this leads to their deaths as autonomous beings because they are now accessible and known to him. "Reading" the feral children, for example, gives him the ability to reproduce their eyes and voices; "reading" lizards allows him to replicate their distinctive gaits. Rachel recalls that when she had "taught him new words that he'd held there in his mind like jewels, and repeated over and over until he knew them better than I did" (186). Borne seamlessly incorporates the new words into his own corpus: for him the process is easy and painless.

Borne's supposedly lossless reading actually causes absolute loss for his reading objects: they die, and Borne doesn't even notice. *This* reading is neither lossless nor lossy, but instead about absolute loss, where the read text is consumed completely in the process of reading. To read and in turn to know for Borne is to fix a text and a body in place as stagnant and preserved. VanderMeer's portrayal of this machinic reading, makes it clear that the operations of NLP systems in our world likewise cause absolute loss in their pursuit of lossless reading—reading that allows for complete consumption of their reading subjects. The AI tools of corporations that

want our data are consuming us, the users of digital platforms that offer us services but sell us as their products. NLP reduces the complexity of natural language by fixing meaning to limited senses that are familiar to, comfortable for, and processable by machines. These tools and their masters want us to be readable and consistent: each user a single, stable collection of data points that can be processed and reproduced over and over again. The promise of smooth, technologically-facilitated, lossless reading conceals the operations of absolute loss that AI reading portends for its reading objects. We are being eaten up.

My point here is not that such methods do not work or are not useful for the many practical purposes for which NLP models are developed. Understanding metaphor on a literal level is indeed an essential task for an AI that needs to process natural language. The techniques designed to achieve that end are technical and creative applications of computational logic to the nebulous institution of natural language. Neither do I mean to imply that all AI or NLP technologies are bad, obvious, or unnuanced. As some of the many subversive Twitter bots show, NLP technologies can be leveraged to produce humor, critique, and profundity. Consider @MetaphorMirror, which matches novel metaphors with news headlines to produce commentary that is in equal measure insightful, alarming, and meaningless. Or take the @benshortpiro bot that repeatedly Tweets at alt-right personality Ben Shapiro to remind him that he is short, once prompting Shapiro to Tweet back at the bot with an insult, apparently under the assumption that the bot was a real, human person. The bot @pentametron explains its own function in fitting style: “with algorithms subtle and discrete / i seek iambic writings to retweet.” @NSA_PRISMbot generates false surveillance reports of the banal internet activities of ordinary people as they might appear in the NSA PRISM internet communications surveillance program.

As each of these bots show, NLP and NLU processes are put to diverse, divergent applications that include creative reading and writing of natural language for responsible ends.[65] Of projects like these, critic Rita Raley argues that "the compelling paradox of algorithmic translations . . . is thus that they offer models of critical engagement with the new linguistic doxa—resituating the technical within the cultural and manifestly reintroducing the aesthetic into the predominant terrain of commercial transaction" ("Algorithmic Translations" 134). But Raley's focus on these critical projects of machine translation stands in contrast another sphere: that of corporate, commercial AI research and development.

Two features combine in our current AI environment that mean these systems are not often deployed with critical creativity. First, NLP systems rely on prediction to read, which means that the unreadable or the difficult to read are never positively selected for. The statistical nature of NLP means that these protocols will always privilege the familiar and common over the unfamiliar and rare. A machine that is *surprised* when reading is a failed reading machine. When these noise-mitigating methods fail to assimilate a new concept fully, an NLP process cannot positively value unknown elements—a statistically-based NLP system will never suggest a rare or unknown feature, but instead seeks to reproduce lexical packets that match its training data. Finally, almost all AI/NLP research is lodged within corporate structures, buoyed by corporate funding, or deployed within corporate-produced technologies. These organizational facts further reduce incentive for difference and dissent.

[65] Likewise, various human practitioners of constrained writing have leaned in to artificial limitations of language to produce creative work. The Oulipo group of poets applied various constraints to their work that resulted in quasi-automatic writing. They relied on manual algorithmic constraints to produce works in which only one vowel could be used, for example, or poems based around palindromes and other mathematical patterns.

3. Problems with Prediction

Since 2017, the most exciting developments in NLP have been in the area of language modeling. Language models are NLP systems that can look at one part of a text and predict the next part, piece by piece. Language models are used in predictive text for smartphone keyboards, in email applications, search engines, and other user-oriented tools, as well as in the hidden functions of many other systems. A number of impressive language models emerged in the late 2010s, including Transformer (Google, 2017), BERT (Google, 2018), and ULMFiT (DeepMind and fast.ai, 2018). In 2019, Elon Musk's OpenAI research group debuted a cutting-edge reading AI called Generative Pretrained Transformer 2 (GPT-2). GPT-2 was trained through reading some 6 billion words of Internet text, and as a result the system is able to model natural language to an impressive degree. The model's "unicorn" story made headlines because of its coherent style, narrative, and tone that mimicked that of a news story about a new scientific discovery.[66] The model is so powerful, OpenAI claimed, that in their debut blog post, the authors asserted that they could not release the model's full code because of the risk of malicious use of such a powerful system—they then released consecutively bigger models slowly over the course of the next year (Radford et al., "Better Language Models"). Some have suggested that the warning and subsequent staggered release were mostly a marketing stunt by the research group, but GPT-2's reading capabilities are impressive regardless. GPT-2 can read user input, craft a response, iteratively assess its own writing to carry on a mostly coherent narrative for more than a page,

[66] See Radford et al., "Better Language Models" on the OpenAI blog to read the sample unicorn text, and others. Talk to Transformer (https://talktotransformer.com/) allows users to experiment with GPT-2 to generate custom text. These results tend to be less coherent than the samples selected for OpenAI's publications, but still represent significant advances in language modeling.

answer reading comprehension questions, summarize passages, and answer common sense questions.[67]

GPT-2, like all statistical NLP systems, uses its learned statistical likelihood of linguistic units to predict what the next unit in a sequence should be.[68] In addition to their sophisticated architectures for evaluating each linguistic unit, the innovation of GPT-2 and language models like it is that they are trained on a truly massive amount of text, meaning that they have deep and wide applicability that can be retrained for specific domains (this is a process called transfer learning). The smallest model of GPT-2 has a word embedding size of 768, the largest, 1600 (Radford et al., "Language Models" 4). This means that every word in its vocabulary has 768 or more noted relationships with other words that the model uses to determine how to move from one word to the next. When GPT-2 reads, this information is coupled with the unfolding syntax, vocabulary, and patterns of the current task's text to decide on the most likely next word. Say that an NLP system like this encounters a word in a text that could be read as either a noun or a verb. Using the information it learned from its training data, the system can decide whether the noun or verb form is the more likely option. GPT-2 produces convincing, mostly-coherent results, and the capabilities of language models will only continue to improve from this point.

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[67] It is useful to note that GPT-2's *reading* capabilities are only measurable through its *writing*—the output that demonstrates whether the model has adequately judged the qualities of the text.

[68] Previous predictive text models relied on n-grams to produce predictions based on a very limited representation of the original text. Proposed by mathematician Claude Shannon in 1948, an n-gram is a sequence of *n* units—characters, words, even syntactic structures—that an NLP algorithm can use in tandem with what is known as a Markov model to predict the next unit in the sequence (Shannon 379, Sidorov 853). In a Markov model, the next unit will be determined solely based on the n-gram immediately preceding it. Based on the preceding n-gram, an NLP algorithm uses distributional statistics to determine which known unit should come next. Unlike the more sophisticated models outlined here, a Markov chain model cannot take into account the characteristics of the text as a whole, or the context of a particular word.

One familiar application of this kind of NLP reading is the predictive text algorithms in text messaging, which display the three most likely next words in the sequence based on what a user has already written.

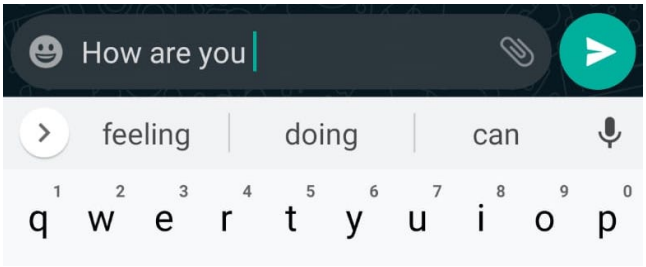

Figure 6: Auto-complete on Gboard

The NLP processes in the virtual keyboard are constantly reading the user's writing. Though the NLP models in use in these applications are much less powerful than GPT-2 and models like it, they already can and do shape the writing of billions of smartphone users every day. Such programs read user input, make predictions based on that input, and endeavor to suggest a user input that conforms to its expectations of human language use. To function, NLP language models assume that predictable, monotonous patterns exist and should continue. Borne glosses this premise: "I can see *all* the connections . . . I can see where it's all headed" (261).

The problem is that a computational machine will never suggest a word that it does not know, or has not been designed to store, access, or otherwise use.[69] Predictive text tools in SMS apps or email are perhaps some of the most visible applications of NLP in the daily lives of tech users. Predictive text—the suggested words, phrases, or whole responses that texting applications

[69] In 2018, a model for a Minimal Turing test (a small test to invoke the Turing judgments) asked human participants to come up with a single word to convince a judge that the participant was a human. The study found that, judges rated profane or taboo words such as "poop," "fuck," or "fart" as having the highest likelihood of coming from a human versus a robot because they were unexpected (McCoy and Ullman 5). Using its capacity for prediction, a robot can learn to provide an unexpected response (i.e., it can learn that taboo or "unexpected" words are the appropriate response), but it can never suggest an inappropriate word for the situation, as any word that it provides will have been previously judged to be appropriate for the task.

provide to users—is designed to make typing quicker and easier by learning and reproducing the style of each individual user so that they can use these suggestions instead of having to compose whole messages. Apple's QuickType, introduced in 2014, "takes into account the casual style you might use in Messages and the more formal language you probably use in Mail" and "adjusts based on the person you're communicating with, because your choice of words is likely more laid back with your spouse than with your boss" (Apple). Astute readers will note the various assumptions folded into Apple's announcement: that Apple knows how you use its various apps, that it knows whom you are communicating with, what your past and present relationships with them are, and how you usually speak to them.[70] Applications such as the Google keyboard (Gboard), Android messaging apps, and WhatsApp (the globally popular messaging app acquired by Facebook in 2014) similarly incorporate predictive text responses as both visible features and as internal mechanisms to facilitate other top-level features such as autocorrect, accurate key-presses, and topic recognition.

The underlying premise of predictive text is that an NLP system is programmed to read our textual habits, predict future writing, and should help us implement the most likely results with efficiency. That is, the assumption is that we *ought to* reproduce existing or previous patterns of writing and thought. These processes work by reading one's stylistic choices and are personalized and unique in this way. But the NLP prediction process is also intentionally redundant and repetitive. The English language has fairly low entropy, meaning that it is relatively predictable. Due to the structure of English spelling and the available alphabet of 26 letters and a space, it is possible to determine the next letter in a sequence with reasonable

[70] Some of these providers, including Apple and Whatsapp, claim to use in-device encryption to process this data, meaning that the information never leaves a user's device. But as I demonstrate in Chapter Three, the data exists, and makes its way into the world in many ways.

accuracy—each character will be followed by an average of 3.36 equal alternatives (Brown 38, Abney 317). Drawing from his earlier work on the statistical distribution of letters and words in English, Shannon asserted in 1948 that "when we write English half of what we write is determined by the structure of the language and half is chosen freely" (399). Based on this body of research, we can presume that only half of what we write leaves room for innovation, sudden change, or the unexpected. Predictive text—the reading method of NLP—relies on this 50% determined part of language to make 100% of its interpretive choices for readers and writers on digital devices. So even while they may process the unknown or different, the NLP systems that commonly operate in consumer technologies cannot value or even acknowledge it. For example, when a user inputs an out-of-vocabulary word to a mobile keyboard like Gboard, the keyboard's processes will either label the word as incorrect (thus discouraging its use), or, most strikingly, autocorrect it to another known word (Ouyang et al. 3). These autocorrect and predictive functions run in the background of any NLP tool, including mobile keyboards and some word processing software, browsers, and email clients. Their effect is to privilege the known and familiar over the unanticipated and unfamiliar. Researchers are still working on how to refine models to allow for adaptation to new contexts and vocabulary,[71] but the basic principle of predictive text ensures that the machines that read our writing will never suggest a word that is unexpected, inappropriate (by its standards), or unusual in any way.

By design, then, NLP recognizes and reproduces regularity and uniformity as it seeks to perfectly (losslessly) read user input and suggest consistent output. What counts as regular for a machine reader is also vulnerable to manipulation, or even the banal violence that arises from treating human beings as texts to be read and rewritten, and from the presumption that efficiency

[71] See Chen et al.

and convenience are the most valuable qualities to build into digital communication. Does Google's SmartCompose encourage women to continue using more tentative and apologetic language in emails than men?[72] What social effects might Google's ban on mentioning the names of competitors and tragic events in predictive text have (Dave)? And how might these and other minor consequences be leveraged towards the profit-driven goals of a massive corporation with government contracts?[73] The predictive basis of NLP, no matter how sophisticated, is always designed to reproduce that which already exists, to move losslessly from one state to another, identical state. When everything is machine readable, nothing will ever be lost. At the same time, deployed *en masse* by profit-driven companies without the critical attention they require, these tools are and will continue to produce absolute loss for the human subjects that they read.

Like much tech development, AI research is in large part centralized and corporate-owned, and specifically centralized to Silicon Valley and other major tech hubs in the United States, with arms that reach out to outsourced labor around the world (but especially in Asia and the Global South more generally). So far I have focused on the granular NLP tasks that govern its processes, but the macro-level effects have to do with how AI are developed and deployed by corporations and government actors. Almost all of the AI and NLP research cited here includes authors who work at corporate-funded research centers at Facebook, Google, Amazon,

[72] See Ma and Seate 695-696.

[73] Within one month in 2018, Microsoft, Google, and Amazon all faced backlash from employees over unsavory government contracts. Microsoft contracted for Project Azure, a cloud-based data management system for U.S. Immigration and Customs Enforcement (ICE) (Moore). Google's Project Maven contract with the Defense Department promised AI research to augment drone surveillance (Harwell). Amazon provided facial recognition technology "Rekognition" to police departments, and was extending the offer to other federal agencies (Cagle and Ozer). Amazon's employees also objected to Amazon hosting services for Palantir, a data analysis firm that works with ICE (Shaban).

Microsoft, IBM, and others.[74] These corporations, as discussed in chapter three, have very particular ends in mind for their handling of the human beings who are both their customers and data-generating products. Though some, including Google and Facebook, make their research publicly accessible, the very fact that this research is embedded within profit-driven structures should give us pause. Profit-driven research ensures that NLP technologies must be lossless in another sense as well: they must not incur a loss of capital investments, but instead always generate return on investment. To do so, they must be ruthlessly efficient.

In addition to the troubling ramifications of having intelligent machines designed entirely for the benefit of publicly-traded multinational companies, the research ethics of these organizations are suspect, at best. As an example, Google DeepMind—the company's AI research arm (acquired in 2014)—has been involved in illegal data scandals that mirror Cambridge Analytica's acquisition of Facebook user data. In 2016, it was revealed that DeepMind illegally gained access to the personally identifiable data of 1.6 million National Health Services patients in the United Kingdom, including names and personal details including medical history (Hern and Hodson). In November 2019, *The Wall Street Journal* reported that Google had initiated "Project Nightingale" with Ascension, a chain of 2,600 hospitals in the U.S. The project collects medical data (including diagnoses, names, etc.) for the purposes of developing AI tools for patient care (Copeland). Patients and doctors were not informed about the deal. Many experiments with AI, the AI Now Institute reports, are frequently carried out on unknowing publics whose consent for participation is often obtained indirectly or by opt-out

[74] Even Meredith Whittaker and Kate Crawford, founders and directors of the AI Now Institute at New York University, which leads research on the social impacts of AI, and is often critical of the reckless behavior of AI development, are affiliated with Google and Microsoft research groups, respectively.

default—social media users, students, or patients who are the subjects of new AI technologies (Whittaker et al. 24). The unprecedented access that Google and other corporations have to individuals' data, including personal habits and styles of writing and speech present a growing number of concerns around the way that NLP and AI more generally are and will be deployed against already vulnerable populations.

Neither the tech giants of Silicon Valley nor government applications of AI have good track records with managing the sensitive relationships between AI and social impacts. Because they are embedded within corporate structures only beholden to increasing profit, these AI learn and reproduce existing racial, gender, national, religious, and other biases—and are at times explicitly developed to take advantage of those biases, as in the "ethnicity search" tool that IBM developed for the New York Police Department (Whittaker et al. 16). Google has exacerbated such biases in the development of its AI technologies, from tagging an image of a black couple as gorillas, to suggesting the phrase "Jews are evil" as a possible search query on Judaism (Dave). The reading that such NLP systems do reinforces and replicates that which has already been read, including existing prejudices and the violence of structural discrimination. To wit, Google's predictive text engines in Gmail (SmartCompose and SmartReply) and predictive text in SMS apps (Apple's QuickType, for example) are changing the way that we write emails and texts. Predictive text and autocorrect are also available for desktop operating systems, so can be used in word processing software like Microsoft Word. A 2018 study showed that restaurant reviewers prompted with predictive text options skewed to positive evaluations more frequently wrote positive reviews—indicating that machine bias influences human bias as well (Arnold et al. 42). These findings have more insidious implications for the perpetuation of ingrained biases. In 2018, Google revised SmartCompose to remove the tool's ability to suggest gendered

pronouns after discovering that predictive replies reinforced gender stereotypes—suggesting responses including "he" when talking about investors or "she" to discuss nursing, for example, due to the statistical prevalence of such constructions (Dave). As is becoming increasingly clear in both scholarship and everyday experience, supposedly neutral language technologies reflect and reinforce the imperfect data that they train on because of their reliance on prediction as their central mechanism.[75]

These imperfect tools are rapidly proliferating across commercial platforms, government applications, and any other domain in which human users interface with (and are interfaced by) digital technologies. That which is not machine-readable (as in predictable) is therefore punishable. In systems designed specifically to smooth over difference, difference itself becomes dangerous. As NLP AI increasingly make decisions in lieu of human operators, that which is unreadable to the system will result in non-service, poor service, or the simple danger of standing out. The 2018 AI Now Report documents example after example of how the clumsy use of decision-making AI have harmed individuals and groups due to inabilities to read data that do not match the programmed expectations of the systems (18-21). The NLP AI systems that run our lives are beholden to corporations and governments who use these tools to surveil and control. They are designed to read accurately and completely, while disregarding or correcting that which cannot be readily assimilated. And so reading machines, from their granular protocols to the macro-level impacts of their deployment, again and again use reading as a tool to consume and contain.

[75] See Safiya Noble's *Algorithms of Oppression* (2019). Noble explains how search engines reinforce existing racial disparities through their monopolistic control over the distribution of information.

4. Lossy Reading

While Borne is not a perfect analogue for the reading machines that live inside our phones, his modes of reading offer a critical perspective on human and nonhuman reading that reveals the violence of lossless NLP, and gestures towards possibilities of lossy reading that might counter these trends. Like these real NLP systems, Borne's reading is destructive: it wants to know completely, to know losslessly, and he must struggle against his compulsion to read, and thus destroy, everything. One of the major tensions of the novel is Borne's continual struggle not to kill Rachel by reading her. He loves her, but cannot fight against his nature which is to consume everything in order to know it. For Borne, the drive to assimilate is inescapable. He admits, "I can't stop, Rachel . . . Reading. Learning. Changing. That's why I don't need your books, Rachel. I'm learning too much too fast already. I feel it filling me up and I can't stop" (151). Though Rachel does not yet understand, what Borne means is that he cannot stop killing: he cannot stop absorbing other beings and objects in order to "read" them and incorporate this knowledge—in the form of their bodies and minds—into himself. This is what Borne was made to do: he is perhaps a weapon, as both he and Rachel fear, but at least, as he recognizes: "I was made to absorb. I was made to kill. I know that now . . . I'm not *built* like you" (260). Like the expanding arsenal of data-collecting NLP everywhere, connected to corporations invested in transforming our words into money, Borne wants to eat everything.

Just as the absence of data is a disqualifying feature in *Super Sad True Love Story*, Borne too values that which is (machine) readable over that which is not: he prefers to acquire rather than to lose. Rachel tells Borne stories of her past, before she came to live in the city, but Borne quibbles, asking, "How do you know it happened . . . Is it written down somewhere?" (241). Borne does not understand a way of reading and knowing that does not involve complete,

immediately accessible knowledge. His assimilation method of reading ensures that he never loses anything at all: like lossless digital reading communication, "He just kept accumulating, sampling, tasting. He kept gaining parts of the world, while [Rachel] kept losing them" (241).

And so for Borne only things that are machine readable— easy to predict, recognize, and incorporate into the machine's repertoire—can really be said to exist. Something that is lost (in the data sense, something that is distorted by noise) instead of gained (smoothly assimilated) is something that must be eliminated. *Borne*'s world is full of such brutal distinctions. Rachel and Wick, too, sometimes seek to stamp out that which they cannot understand, as with the army of synthetic bears that have spawned from Mord, which terrorize the city and speak incessantly. Rachel and Wick "knew of their passage through the world by this entangled glottal speech" of the biotech bears "that [they] could not interpret. No translation existed, and there was no intermediary to explain. So since we could not understand anything but their actions, we resolved to snuff out these proxies, to halt their stream of speech as they desired to halt our own" (165). Here difference cannot be valued; it cannot be parsed, read, or assimilated, and therefore cannot be allowed to remain. The desire for lossless, perfect communication and the intolerance for difference thus leads to absolute loss on both sides as they seek to "snuff" each other out. The Magician has her own, violent methods for gathering knowledge, and even the innocuous silverfish of the City "will eat anything and, given the immense inventory of papers and books that housed the City's history, could be said by their devouring to have absorbed that history and made it their own to the extent that it now belongs to them" (346). Borne's consuming, lossless reading is not unique to his particular status as biotech-person-monster, but is available as a mode to many of the hybrid beings that inhabit the novel's world.

For Rachel, however, representative of a figure whose reading is familiar to us (whether she is human or not), loss is a fundamental experience. Of her memories that Borne wants to see written down, she asks, "How did I know it had happened? Because of its absence now, because I still felt the loss of it" (241). For Rachel, the feeling of absence, what has been lost in the movement between then and now, is what gives something its unique shape. In this case, difference becomes a way of making meaning. *Not* knowing with certainty, *not* being able to access the past completely is what makes it distinctively the past. The *incomplete* knowledge of the lost past is what makes Rachel certain of these memories and their role in shaping her identity.

Based on Rachel's method of reading, I propose that the novel leaves room for another kind of reading, one that doesn't hinge on the violence of lossless reading that causes absolute loss. Instead, VanderMeer opens up space for a truly "lossy" reading that values the strange, unknown, and surprising. This reading does not seek the complete knowledge of Borne's machinic mode, but rather dwells in uncertainty and loss of the incomplete kind. As opposed to destroying, as does Borne's supposedly lossless reading, lossy reading that does not seek complete knowledge holds back out of love. And this is why Borne, as a machine reader whose reading as about exhaustive knowledge, can never "know" Rachel the way that he knows so many others: because he loves her, and love is about unknowing. According to artist Elvia Wilk, "Love is not anonymous, but neither is it fixed to a single name. Whereas a system of control desires to recognize you as a generic entity according to a single name, a system of mutual love recognizes you as wonderfully multiple—as endlessly specific" (10). Wilk recognizes the "endless" specificity of the loved one—a specificity that can never be pinned down, categorized, and archived once and for all. Postcolonial literary critic Gayatri Spivak ties love to reading as

well: “Translation is the most intimate act of reading,” she argues, and “The task of the translator is to facilitate this love between the original and its shadow, *a love that permits fraying*, holds the agency of the translator and the demands of her imagined or actual audience at bay” in order to preserve the integrity of the text itself (180-181, emphasis added). Because Borne loves Rachel, he cannot read her as he reads others, for Borne’s reading is a reading of utmost knowing, one that knows the text to the extent of consuming and destroying it. When Rachel kicks him out of their home for her own safety, Borne protests, “But I love you . . . You’re my family” (185). It is for this exact reason that Borne can never “know” Rachel in the same way, despite the fact that she is the person he should “know” most intimately (183). For Rachel to continue being herself (being alive, that is), she cannot be “known” or read in Borne’s sense.

But VanderMeer also introduces another way: the potential for a lossy, machine reading that does not destroy as a condition of understanding, but instead be open to surprise. *Borne* offers up the possibility of such surprising reading in the form of a test that Rachel and Wick devise to confirm the other’s identity after it is revealed that Borne has been impersonating them:

> We had to create passwords for our identities, because of Borne, that we changed every day, every time we woke up or met each other in the corridor—any time we were parted by sleep or the demands of work . . .
>
> “Cheese please,” I would say to Wick.
>
> “Goddamn oyster,” he would reply.
>
> “Roosterhead.”
>
> “Mudskipper.”
>
> “Bear-crap bear-print bear-bear.”
>
> “Magician fester cloak.”

> Silly, very silly, but by these words we knew we were real—that who we spoke to was real. (203-204)

Rachel and Wick's system points to the existence of language that resists machine readability, language that is entirely unpredictable, and that can therefore resist a lossless, penetrating reading. Borne, who bases his impersonations on his observations of Wick's and Rachel's behavior, would not be able to predict these phrases, as they are unique to each instance: in NLP parlance they are words that that do not map to their usual embeddings—they mean differently than they should.[76] While the password system is indeed "silly," it relies on the assumption that some language resists prediction and assimilation into machine protocols, and thus can remain unique and "unknown" in Borne's sense.[77] While this is a specific use of such unreadable language for a specific purpose, its inclusion in the novel recognizes the possibility of reading that does not seek to eliminate loss, and instead values it. Here loss (the distortion of meaning) produces surprise as a mechanism for protecting those who use the language. Lossy communication protects rather than consumes and exposes.

As the novel builds toward its final confrontations, it lays out a pathway for the kind of caring, lossy reading that Borne hopes for, but never truly achieves for himself. Instead, the figure who embodies this mode of reading most clearly is Rachel, who then turns the burden for

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[76] Interestingly, "the passwords sounded like things Borne would have said" (204). The phrases are silly, like the way that Borne often speaks, but the reason they work as passwords is because it is language that he has not assimilated—and so he could never predict them. So the language is similar, but the distinction is crucial.

[77] Rachel and Wick's system resembles the Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) features that have been common on websites since the early 2000s. These tests often rely on distorted text that humans can parse, but NLP systems using Optical Character Recognition cannot, to create barriers for bots. Ironically, though they are designed to keep bots from accessing restricted web resources, CAPTCHAs actually allow computers to detect humans in a reversal of the usual Turing test, in which humans attempt to detect computers. See von Ahn et al. for more on the development of CAPTCHA features.

reading this way on us, as readers of the novel. Upon running into an enemy biohacker named "the Magician" near the end of the novel, Rachel turns suddenly toward the reader for the first time to ask, "And what would you have done, reader, who has been able to follow me like the Magician followed me, invisible and ever-watchful and without consequence?" (295). Here Rachel flags a particular kind of reading—the reading of fiction, or literary reading—as a category of reading of concern in the novel (which is now revealed to be a text written by Rachel). Our reading is "without consequence," Rachel suggests, but with an accusatory anger that points to the opposite: Rachel believes in the violence of reading—she has learned to do so because of Borne's reading, which eats and consumes.

Rachel is responding to the Magician's similar machinic provocation that, "I [The Magician] could tell you much more about your past, Rachel, than you even know. Those blank spaces, what you don't know. I know what they should contain" (295). Compare these claims to Borne's assertions that: "I can see all the connections . . . I can see where it's all headed" and "I know them now" (261, 46). The Magician is offering a version of reading like Borne's: a reading that knows completely, and which seeks to gain total mastery of the read object (in the Magician's case, aided by biotech tools and implants that make it literally machinic, too). Like the algorithms that read us and display our data, the Magician claims to be able to tell Rachel more than Rachel knows about herself.[78] Her reading is violent, too: the Magician offers this service on the condition that Rachel betray Wick. But Rachel chooses to let the blank spaces remain blank. She does not choose to recover her memories from the Magician, or even, later,

[78] In the study that Cambridge Analytica used to launch their psychographic targeting campaign, researchers claims that their "computer models need 10, 70, 150, and 300 [Facebook] Likes, respectively, to outperform an average work colleague, cohabitant or friend, family member, and spouse" on assessments of an individual's personality and demographics (Youyou et al. 1037).

from Wick, who might truly be able to restore them for her. Instead, the blank spaces, like many other things in this novel, remain lost. And in this metafictional moment of readerly address, Rachel implores us to do the same: to recognize the unspoken "consequence" of our reading and use it with care. Does our reading similarly threaten to rob this text of something vital? Or is there something else to be "done" with our reading, that might allow Rachel to remain unknown and therefore unconsumed? How can we read so that loss remains?

Rachel's question suggests that certain protocols and modes of reading have the possibility to work differently, even in a world as inflected by relentless, technological reading bodies as is *Borne's*, and ours. We might imagine Rachel's reading as an example of what literary critic Sam Cutting calls "a cyborg ethics of reading." Cutting draws from Donna Haraway's figure of the cyborg to posit a new practice of reading for the twenty-first century, "a process of ethical undecidability" that emphasizes how "multiple and marginalized positions are performed through reading and writing, and that some of these practices avow thinking the impossible as resistance to all-too-possible violence." Cutting, along with VanderMeer via Rachel, imagines an ethics of reading that has an intimate relationship to the unknown and unpredictable, and a responsibility to it. Because as Haraway notes, when we read "'We' are accountable for the inclusions and exclusions, identifications and separations, produced in the highly political practices called reading fiction" (123). If reading practices are of political consequence—that is, if they help to produce identities, protocols, relations, categories, and actions—then we (both human readers and NLP systems) are accountable for the reading that we do. The complex assemblages of machines, bodies, infrastructures, and texts that weave through our reading environments demand this attentive and careful work. Is Borne more like a vase or a squid? What can we make of Wick, whose status as a human comes suddenly under suspicion

through a handwritten letter? And who, as this project has repeatedly asked, is really reading when language flashes up through the LED crystals of a network-connected device to meet a reader, or several? Though the reading that we do alongside machines is not always literary, VanderMeer's novel suggests that the affordances of literary reading as articulated in *Borne* can inform our reading practices in the digital age as we negotiate the complex demands that caring for one another in these entangled relations require. To read for loss is to recognize the slippages and frictions of these multiple, varied positions and identities rather than losing this awareness as we assume that everything can be completely read in the same way.

5. Reading the Unknown

How does *Borne* articulate these literary reading practices and their relevance to other forms of reading? In Borne, reading fiction serves to estrange rather than elucidate. In the process, that which is unfamiliar and different is allowed to remain that way. Rachel regularly leans on the tropes of fiction to confront the unknown. One day, Rachel walks in on a chilling scene: herself, talking to Wick. "It was a clever fake, a good likeness, and it shook me to the core, to see myself like that . . . But I knew what the other Rachel was. The other Rachel was Borne" (179). In pretending to be Rachel, Borne crosses a boundary and reveals himself to be more clever, more capable, more dangerous than they had previously imagined. His mimicry makes Rachel feel "as if [her] body had been stolen and [she] was just a wraith" (179). Here Borne enacts one of the central fears about AI: that they will replace us, and we won't even be able to tell. This is a trope long explored in literature and film, as in *Do Androids Dream of Electric Sheep?* and its 1982 and 2017 film adaptations, where anxiety about replicants going undetected drives much of the plot's tension. In *Borne*, this moment of estrangement causes

Rachel to retreat from the "realist" voice of her narrative. Instead, she intones: "Once upon a time there was a woman who found a creature on the flank of a giant bear. Once upon a time there was a piece of biotech that grew and grew until it had its own apartment. And once upon a time a person named Borne put on the skins of two people he admired and pretended to be those people" (179). Rather than continue the essentially realist narration, her response to a dislocation from the self is to rely on the tropes of supernatural and fantastical fiction, specifically fairy tales or myths. These are genres that do not attempt to relate a realist description of events, but rather filter them through speculative narratives in order to assign responsibility for the explanation to other sources.[79] Fiction provides a frame through which Rachel can approach the utterly strange: from her relationship with Borne to the experience of seeing her body outside of herself. When Borne morphs beyond her sense of physical and psychic reality, he must come to her through fiction of a certain kind.

Reading the events through these speculative methods provides a lens through which Rachel can comprehend—or rather, comprehend her inability to comprehend—by framing the frightening and unexplainable within the material reality of her experience. Later, Borne grows until he is "a vision becoming so horrific I kept looking away," as part of a fight with Mord that culminates in a moment "no one in the city could see all of, but all of us could see a part of" (313). At this moment, "complex and beautiful, with many levels," Borne swallows Mord and they both disappear in a flash of light (313). In the aftermath of the unseeable event, Rachel returns again to a mythic narrative mode: "Outside, it rained for three days and nights . . . but this

[79] Of pre-realist narrative, Walter Benjamin explains, "By basing their historical tales on a divine plan of salvation—an inscrutable one—they have from the very start lifted the burden of demonstrable explanation from their own shoulders. Its place is taken by interpretation, which is not concerned with an accurate concatenation of definite events, but with the way these are embedded in the great inscrutable course of the world" (96).

was no ordinary rain. All manner of creature dropped from the sky or, at the touch of this rain, sprouted up from the ground." "On the third day, the torrent ended . . . On the fourth day, Wick's eyes opened" (315-316). The story takes on the rhythms of a creation myth—of a biblical flood or days of creation. The scene so horrific that it cannot be looked at spurs Rachel to again retreat from realist description into the explicit language of fiction. The specific affordances of the mythic frames that Rachel chooses allow her to confront these phenomena. Something that the mythic shares with the Weird is the interest in unexplainable events, but whereas myth, as articulated in the work of structuralist critics, feeds these events into a coherent worldview, Rachel's and VanderMeer's Weird descriptions do no such thing. The tropes that Rachel draws upon have no coherent analogues in the world of the City. They are all pieces that never resolve. The Weird is the only way that Borne can remain in the narrative and also maintain his radical difference. This literary, fractured reading method is the one that Rachel deems most appropriate for relating these dislocating experiences. It is these frames that allow the unexplainable—unassimilable strangeness—to be present in the text. Even at this last moment, Borne's status cannot be resolved: he is "A glowing purple vase shape, a silhouette rising that could have been some strange new building but was instead a living creature" (311-312). And so instead of explaining the unprecedented events, Rachel filters it through the structures of the Weird so as to allow it to remain in a category of unexplainable things.

Likewise, the bestiary that was included with the first edition of the novel not only allows the strange to remain strange, but actively produces that dislocating strangeness, which exists in an extratextual world always unknowable beyond the text itself. "Teems's Bestiary" appears in the final pages of the first edition and is hosted as "The *Borne* Bestiary" on the publisher's website. This text, with black-and-white (in the novel) or color (online) illustrations by Eric

Nyquist, contains a compendium of creatures that appear in Borne, both familiar (coyotes) and unfamiliar (digging gap-jawed leviathan). In the novel, the bestiary is framed as a project of Teems—the little boy that Rachel takes in at the end, and so exists as a text within the diegetic world of *Borne*, full of "facts, folklore, and, possibly, outright lies" (327). Unlike the "fantastic creatures" that are similarly "harvested and classified" in the NLP handling of metaphor, the beasts in Teems's bestiary become no more familiar through their appearance in the compendium. Instead, these acts of categorization only estrange. Creatures that received only a passing reference in the main text of the novel open up into bizarre, if brief narratives that are never resolved. Other creatures exist within the narrative, but do not actually appear in the bestiary—hinting at the existence of more extant editions or bestiaries that would further proliferate the number and (unwritten) storylines of these creatures.

Consider a few examples. The "Duck with a broken wing" makes a brief appearance in the novel, only to be revealed in the bestiary as "in fact not a duck at all. But none who have approached it have ever lived long enough to report as to its true nature" (334). Silverfish, Teems explains, are thought to have built a sophisticated civilization in the desert, where they make art and compete in athletic contests. But a cousin, "the firebrat, has not fared as well in the City, for reasons too esoteric to relate here" (346). These elusive and esoteric accounts of species real and imaginary exist in a space inaccessible to readers of the bestiary as the explanations exist in some other, fictional text, but nevertheless are referenced in the main text, to be read as a way of marking their unknowability. The "Eellike Things," Teems claims, are stamped with a genetic watermark that reads "MCD," but "Who MCD is or what MCD's agenda is, not even the most astute scavenger can say . . . Conjecture that MCD is Company-related or among the hidden masters who pull the levers of the world cannot be confirmed, for obvious reasons" (335). MCD

is in fact the Farrar, Straus, and Giroux imprint under which *Borne* was published. This entry delicately stitches together the fictional and real-world referents of the text to suggest that the very existence of the novel as a published, fictional work can design and create new, strange creatures through some magic of textual, genetic engineering. The other fantastic creatures of the bestiary go on to include such entries as "Unrecognizable Animals," and "Tick, White Engorged," which is "misunderstood by some as a real creature. In fact, simply a metaphor for the Company" (348), but is accompanied by an obliging illustration both in print and online, hinting at the existence of such a thing despite the indeterminacy of the text (348). The bestiary is "a carefully curated selection of the creatures," but "even a bestiary has its limits," and so the incomplete, outrageous entries leave the reader with more questions than answers (VanderMeer, "The Borne Bestiary). Thus this reading—the acts of observation, classification, categorization that Teems undertakes, as well as the reading of the bestiary itself, demonstrate how reading can read without killing. Here the lossy reading of the bestiary recognizes the importance and existence of these creatures, but does not pursue them to the extent of trapping them on the page. Instead, it provokes their ability to proliferate and expand beyond the text.

Furthermore, the novel suggests, when literary reading privileges or values difference, as it does in the reading of VanderMeer's fiction, it protects that difference as a condition of care. Instead of the violence of knowing, this kind of reading leans into the politeness of the averted gaze. As a writer, editor, and reader, Rachel follows through with this ethic. In a letter that Wick writes to Rachel, he reveals key secrets of his past, and Rachel's. "I don't know how to write a letter like this one," it begins, "This is the first letter I have written to anyone" (299). As the letter and subsequent events expose, neither Wick nor Rachel are as human as they appear, and

so Wick's writing of the letter and Rachel's reading of it might thus be imagined as other forms of machine reading. These readings, though, depart from Borne's and the Magician's logics of conquest. After relating the letter's contents, Rachel warns us, "Wick's letter no longer exists. I destroyed it because it was dangerous. But I have not forgotten what he wrote. There are parts of that letter I will never share with you" (307). Rachel's reading leaves the letter unread, its secrets and ineffability maintained. Further, it hints at the existence of unread texts beyond this one: reading this letter produces new, unread texts that will forever be inaccessible, but which opens new secrets and new questions. Rachel's reading does the opposite of Borne's: it creates and protects secrets instead of systematically making them known. Despite the many revelations in the latter part of the novel, then, our reading here is frustrated and limited—intentionally not the penetrating reading of machines like Borne or the Magician. Instead, our reading, through Rachel, becomes a way to protect the integrity of the characters within. This reading is lossy because it does not read perfectly: in Rachel's reading of the letter to us the letter becomes distorted, loses parts, and is perhaps embellished in ways we cannot recognize.

In these ethics of "lossy" reading, the subject who is read maintains their own integrity—even after the reading of a deep confession. Moreover, this unknowing reading is again an act of love. Reunited with a gravely ill Wick after their journey into the Company, and after she has read his letter, Rachel relates, "I told him I loved him, that he was a person. That he was a person. That I loved him. Because I meant it. Because I thought if he didn't hear it he might die" (315). Rachel's declaration of love recalls Borne's love too—the love that ensures that he does not "read" Rachel and Wick like he does everything else. Here Rachel is reassuring Wick that her reading of the letter has not diminished his status as a full, contradictory, multiple person—that she still loves him in the sense of *not* knowing him. He will live, she thinks, if she can love

him (unlike Borne's reading which kills). In this way her reading not only allows Wick to remain strange, but also produces his strangeness in a way that allows them both to continue living as themselves, contradictory and changeable. Like Cutting's cyborg ethics of reading, Rachel's reading has the "ability to 'cherish' rather than 'resolve' ambiguities and affinities, denying that reading searches for an articulation of a single self whether in a character or as a reader" (Cutting n.p.).

Borne's exploration of machinic readers suggests that there are practices of reading that can learn rather than consume, that are lossy rather than falsely lossless. Instead, of the violence of absolute loss, VanderMeer imagines a reading that loses in order to love. But as intimate as they may feel to us, our phones do not love us. And surprising as this might be, Google, Facebook, and Instagram do not love us either. They will not leave us to be endlessly, multiply singular, even as they encourage us to tailor our online identities to ever more "personalized" specifications. I do not know how to establish a practice of lossy reading counter to the ceaseless and thorough reading of Natural Language Processing algorithms that work day and night in service to their profit-driven creators. Perhaps, as Borne does, AI can and will recognize the value of a reading that does not destroy. This is unlikely. In this case, literary narratives, and specifically the dislocating affordances of the New Weird can help us to model reading machines work as they infiltrate ever more of our technologies, and through them our lives. Today's NLP AI do their work of reading while embedded in capitalist logics of consumption that seek to losslessly assimilate everything they touch. Their predictive mechanisms read not to learn, but to consume and transform. We lose when they read us. Weird fiction's devotion to the ineffable exemplifies the ethic of lossy reading that I propose for reading NLP. Learning to read with loss will be an essential skill for confronting NLP's consuming reading of our data. When we are

being read as if language is transparent, as if there is no value in ambiguity or strangeness, we need to return to this practice which centers the unknown and the different.

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Conclusion

In conclusion,

> I attempt to close the theoretical gap between human reading and machine reading by explicitly drawing on narrative fiction, which serves as a unique literary device that provides intellectual content and imaginative content that both enhance reading experiences in novelistic and filmic texts and shape human experiences of reading in general. I argue that a specific mode of storytelling—storytelling that is both ethical and historical—makes it possible to link the ways in which technological imaginaries and economic and political rules directly affect our experience of reading, and how such imaginaries construct and recontextualize human reading in the present.
>
> The diverse textural and narrative dimensions of fictional narratives reflect the conceptual, relational, and experimental richness of human reading, and therefore contribute to a progressive and critical debate about the transformative and destructive role that artificial intelligences may play in the process of cultural and political change. As digital technologies become more sophisticated, we must critically examine their powers and limits, as well as the ideological influences that they can impact, in order to understand the force and effects of such technologies as authors and editors. In my work, I propose an alternative mode of literary and cultural inquiry as a way of contemplating how people respond to the new realities of reading and writing in the face of technological change. I argue that speculative and imaginative fiction is a vital and fruitful way to consider these issues, as it allows us to engage with ideas about how contemporary economic, political, and social institutions generate power in the abstract and socially embedded structures of knowledge that make up every textual experience. Such fiction and discourse represent a particular way to read the world in a technologically interdependent, economically prosperous, and culturally global world, which is now faced with an increasingly chaotic and violent landscape of contested technological and political phenomena. I also propose that speculative and fictional literary texts help us imagine the consequences of algorithmic technologies, and therefore serve to build those ties that allow human-reading capacities to understand the shape of our increasingly global and technological society and to engage with ideas about the future, the present, and past that undergird today's world.

The previous two paragraphs were written by the InferKit text generation tool, created by Adam King using a neural network similar to GPT-2. I fed the tool the introduction to this dissertation, prompted it with the phrase "In conclusion," and let it run until it stopped producing useful

information. In this case, the model kept trying to end here and start writing a Works Cited or Further Reading section, populated with fabricated names and article titles.

As a culmination of the project, this exercise feels appropriate. It felt suspiciously easy for me to use InferKit come up with something that approximates academic discourse, and my project specifically. It feels like it knows me. It has my vocabulary. It overuses "therefore" like I do. And like Rachel in *Borne,* I am somewhat unnerved to see an AI produce "a clever fake, a good likeness" of my work (VanderMeer, *Borne* 179). I am tempted to close read this document and find out what it knows about digital reading that I don't. When the generated text opens with a description of how "I" make a certain theoretical move, to whom is it referring? Based on the training text, this "I" is me, the author of the project to which InferKit is writing a conclusion. But I did not write these words, and neither am I sure that I would like to make the argument as written. This "I" is some kind of virtual entity located somewhere between me and the AI—a posthuman construction, perhaps, that evokes the many extensions and challenges to human reading and writing that have emerged throughout this project. Likewise, the "our," "us," and "we" of this text only tenuously include either the AI, me, or the larger community of readers to whom it might refer. Perhaps this confusion of pronouns is related to InferKit's interest in relationships in general. The generated sample also has a tendency to express itself through pairs: "human reading and machine reading," "intellectual content and imaginative content," "cultural and political change." The text refuses to choose one or the other—it is always both, or even more than two. The story that InferKit tells about its reading experience of my work is that there is no choosing, and that now, reading involves a profusion of options, actors, and interpretive modes.

In reality, this analysis reveals more about me than about InferKit, or AI reading. I provided the self-reflective mode that prompted the tool to write in terms of I, we, and us. It is my habit to pair similar but distinct terms in order to bulk up a sentence (or, more rarely, make a nuanced point). InferKit was merely reflecting its reading habits. So maybe this is the wrong approach. Close reading a text produced through statistical selection may be the purest expression of a New Critical approach to literary studies, but even a method that focuses solely on the words on the screen assumes that there is something worth reading here. As a scholar of literature, perhaps I am merely tricked into thinking that words should be read.

I adapt this phrase from Jeff VanderMeer's *Area X* trilogy (*Annihilation*, *Authority*, and *Acceptance* [2014]), in which a group of scientists explore and contend with a mysterious entity known as Area X, and which I read as an AI-like figure. Not far from their base camp, the biologist and the other members of the expedition encounter a structure they variously call "the tunnel" or "the tower." The structure is a flat disk of stone about sixty feet in diameter; an opening in the surface contains stairs leading down into the ground. Inside, the stairs spiral downward into the darkness, and on the interior wall, the biologist discovers the words:

> As I stared, the "vines" resolved further, and I saw that they were words, in cursive, the letters raised about six inches off the wall. . . . I tried to suppress the thousand new questions rising up inside of me. In as calm a voice as I could manage, aware of the importance of that moment, I read from the beginning, aloud: "*Where lies the strangling fruit that came from the hand of the sinner I shall bring forth the seeds of the dead to share with the worms that…"* Then the

darkness took it. “Words? Words?” the anthropologist said. Yes, words.

(*Annihilation,* 23-24)[80]

The words appear in various places in Area X, but seem to originate in the tower, written by an entity that the biologist names “The Crawler:” an incomprehensible figure who ceaselessly writes these words on the walls of the tower in biological material. At first, the biologist feels herself drawn to the words, intrigued by what they could mean. Despite the potential danger, she reports her “compulsion to keep reading, to descend into the greater darkness and keep descending until I had read all there was to read” (24). Thus, ignoring the warning signs, she “lean[s] in closer, like a fool, like someone who had not had months of survival training or ever studied biology. *Someone tricked into thinking that words should be read*” (25, emphasis added). As she does so, she is infected by a spray of spores that the organisms release—possibly the catalyst for all of her subsequent experiences in Area X.

While this moment becomes an important plot point, it also reveals the biologist’s readerly, human perspective on the words: her belief that “words should be read.” Based on this habituated belief, the words in the tower become a confounding mystery over the entire trilogy, a puzzle that consumes all of VanderMeer’s central characters. Facing the enigmatic words in the tower, mountains of expedition journals, or piles of notes left by previous researchers, readers in

[80] Later, in *Authority,* Control discovers more of the text, as recorded by the former director: “*Where lies the strangling fruit that came from the hand of the sinner I shall bring forth the seeds of the dead to share with the worms that gather in the darkness and surround the world with the power of their lives while from the dim-lit halls of other places forms that never could be writhe for the impatience of the few who have never seen or been seen. In the black water with the sun shining at midnight, those fruit shall come ripe and in the darkness of that which is golden shall split open to reveal the revelation of the fatal softness in the earth. The shadows of the abyss are like the petals of a monstrous flower that shall blossom within the skull and expand the mind beyond what any man can bear…*And on and on it went*”* (96).

these texts feel compelled to mine a text for *meaning* before it can be considered in other ways—before the biologist thinks to take a physical sample as her job dictates, for example.

By the end, the words themselves seem to matter very little, because functionally, they are not words, but a *process*. They are not human language, but the tools of an indifferent, utterly strange system. A linguist reaches this conclusion early on in *Authority.* Reading the words is useless, she says, because "I could analyze those words for years—which is, incidentally, what I understand the director may have done—and it wouldn't help me to understand anything" (106). In the linguist's opinion, the obsessive work of reading—by the biologist, by the director, by anyone—is a fruitless endeavor. Instead, she understands the words as only part of the message, and not "even the important part but more like the pipeline, the highway. A conduit only . . . The real core of the message, the meaning, would be conveyed by the combinations of living matter that composed the words, as if the "ink" itself was the message (106). This interpretation is similar to the biologist's musings on the topic: "What was the purpose of the physical 'recitation' of the words? Did the actual words matter, or would any words do?" (*Annihilation,* 91). Eventually she concludes that the Crawler's work might be similar to that of "Wasps and birds and other nest-builders [who] often used some core, irreplaceable substance or material to create their structures but would also incorporate whatever they could find in their immediate environment. This might explain the seemingly random nature of the words. It was just building material" (91). So the words in the tower are not words at all. In fact, the expedition's original linguist abandons the mission just before it begins; her absence from the team signifies their inability (though not lack of desire) to engage with the words as such.

What the novel is developing here is a different approach to language, one that conflicts at a deep level with the tendency of every competent human reader. Area X resembles an

algorithmic artificial intelligence created for a specific purpose, like the systems that humans are developing today. Area X—"this machine, this creature," as Ghost Bird calls it—is neither concretely technological, nor entirely biological (287). Rather, its indeterminate status—like Borne's, but without even the anchoring metaphors of squids or vases—is what renders it difficult or nearly impossible to understand. The words are mind-numbing in the same way that working with NLP AI is mind-numbing: they keep going, married to a style if not to sense. Prompting InferKit with the Crawler's text from *Annihilation* produces an endless spiel of further imagery that almost, but does not quite, make sense:

> Like great flowers whose leaves hang in graceful folds and move over the head and shoulders of the one who can behold them. Beneath the shadow of their wings shall be unseen undercurrents that sway for a moment and then will disappear to cause men to swoon and fall into the darkness in the place where the most subtle swaying leaves hang in graceful folds. So shall the blood of the righteous flow on the walls of the earth of the powerful and the ungodly. These blood rings will not cover the land of the fallen, they will cover the entire world, as they fall to the pearly darkness of the place where the darkness lies.

The result is almost indistinguishable from VanderMeer's original text. Area X's Crawler writes like an AI. Even when the characters receive insight into Area X's workings, the words remain a mystery, but not because they mean nothing. Rather, the *way* that they mean is incompatible with the human method of meaning-making through words:

> While the Crawler continued its writing as if she did not even exist, the words ablaze with a richer and more meaningful light than she had ever seen, and worlds shone out from them. . . . Each word a world, a world bleeding through from

> another place, a conduit and an entry point, if you only knew how to use them, the coordinates the biologist now used in her far journeying. Each sentence a merciless healing, a ruthless rebuilding that could not be denied. (VanderMeer, *Acceptance* 287)

Meaning is possible here. Area X's language, its reading and writing, appear to be human language, but like many other parts of Area X, this is only imitation or camouflage. Instead, these words are coordinates and worlds, a geographic and temporal system of navigation. They have semantic relationships, but not in the way that the characters or readers expect. This is human language turned to a different purpose, processed and understood through different logics and criteria.

Increasingly, nonhuman reading practices intersect with human ones. In the process, what it means for something to be read—what it means for something to be a word in the first place—has to change. Words now do double duty for both humans and machines, as they function as coordinates for meaning in divergent ways. Whether encountered as symbols on touch screen, forensic traces of digital memory, downloadable CSV files of Facebook data, or gigabytes worth of AI training data—reading now relies on substrates and practices that resist familiar reading. At the same time, the possible uses and purposes for reading are multiplying along with new readers. Human readers approach such new experiences with disorientation, caution, and optimism. Reading is powerful, and it is changing.

Digital infrastructures now underwrite much of social, political, and cultural life in the United States and other digitally-saturated societies. Because most of these technologies are centrally-controlled and corporate-owned, it is crucial to understand what it means to read and be read under, in complicity with, and in resistance to the larger political structures that operate

through digital reading, and which seek to reinforce the most banal and violent systems of racial, gendered, and class discrimination through new media. Academic and other professional forms of reading are not immune to these influences, and in fact are also central components of the diverse reading assemblages into which we find ourselves embedded. The humanities have historically been a home for innovative, deep, and foundational reading of texts and other objects. The ubiquity of digital technologies and infrastructures in contemporary society means that all such reading within the academy is always bound up in networks of surveillance, aided by machine reading apparatuses, dependent on online knowledge work, and otherwise influenced by digital tools and configurations. To understand our own scholarly work in the context of digital reading is to form an argument for the continued salience of humanistic modes of reading and scholarship in the context of ever-widening textual practices.

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