



Explorations with Small Data: Data Settings and Backstories

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ABSTRACT

As data continues to exist in a world where productivity, capitalism, and surveillance prevail, we turn to the concept of Small Data to reclaim and engage personal data. According to information designer Giorgia Lupi [15] this approach to data acknowledges how data may be imperfect, serendipitous, subjective, and focuses more on quality than quantity. In this provocation, we offer three explorations where we physicalize personal data: handwritten notes, photos of everyday artifacts, and menstrual cycle data. In each data collection and representation set, we focus on the inevitable presence of ‘the backstory’: the context and setting in which data are collected and materialized. We conclude with a reflection on the power of context as a way to navigate privacy in personal data.

CCS CONCEPTS

• Human-centered computing/Interaction design;

KEYWORDS

Data, Data Physicalization, Archive, Collection, Personal data, Self-tracking, Story

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1 INTRODUCTION

In today’s world, a vast amount of data is generated from various sources, such as smart devices. Emerging technology mediates nearly every aspect of our daily lives. For instance, smart connected artifacts—such as smart bulbs, motion sensors, smart watches, etc.—are part of a fast-growing global market. This market runs on profit and functionality derived from Big Data and often occurs in intimate private spaces, such as domestic environments. In an era where data has become a company’s most valuable currency (e.g., surveillance capitalism [23]), data also creates a feeding ground for an asymmetry between the large entities who control, use, and benefit from this data collection and those who create this data [4]. However, instead of focusing on the power and potential abuse of Big Data, we turn to the concept of Small Data to reclaim ownership of personal data in this provocation.



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Small Data reorients the focus towards a more personal and closer relationship with data. Scholars in the fields of human-computer interaction (HCI), Arts, and Humanities have argued for a perspective of data that foregrounds its messiness, subjectivity, interpretative side, and imperfect qualities [2, 12, 18]. A good example is the work of Giorgia Lupi and Stephanie Posavec ‘Dear Data’ [15], where the designers exchanged and created weekly handwritten and hand-drawn data postcards.

Using first-person research to create design provocations, in this project, we further investigate how Small Data might create and gain meaning. In particular, we examine how data settings (how data was collected and where it comes from [12, 13]) might hold the key to keeping Small Data personal and expressive. We find that focusing on how we collect and materialize small collections of personal data (e.g., information, traces) might help us revisit a more human definition of data. We believe this approach offers value for individuals to regain control and ownership of their data. In the sections below, we share and discuss three first-person explorations with handwritten notes, photos of everyday artifacts, and menstrual cycle tracking data.

2 RELATED WORK: SMALL DATA, PERSONAL DATA TRACKING, AND DATA PHYSICALIZATION

Our project builds on recent interdisciplinary works in design, humanities, and the arts, which challenge common definitions of data, instead emphasizing its messy, imperfect, subjective, and local nature [3, 4, 6–8]. Giorgia Lupi’s work on Small Data emphasizes the strength of data in providing unfamiliar perspectives, challenging people to view data as a source of unfamiliar and valuable viewpoints from various times and places [15]. For example, Lupi’s recent visualization of her long COVID experience in The New York Times opens up space for a practical application of Small Data to the broader public [14]. Further, the concept of Small Data intersects with wider discussions of data feminism, particularly power dynamics and asymmetries, which are explicitly discussed in data collection, processing, and representation [2]. Closer to HCI, researchers like Estrin [6] and Kientz [10] contribute insights into Small Data with a personal perspective, emphasizing the potential of Small Data sets with an ‘n=me’ approach. Arguing for a shift towards individualized, Small Data-driven health practices represents a fundamental change in perspective and approach, placing the power of data directly into the hands of those it concerns the most—the individuals themselves. Small Data not only refocuses on the personal, but it can also bring light to the conditions in which data are collected and analyzed. For example, Loukissas [13] challenges the conventional understanding of ‘data sets’, emphasizing the need to shift from isolated datasets to the broader concept of ‘data settings.’ He states that recognizing the local condition of data

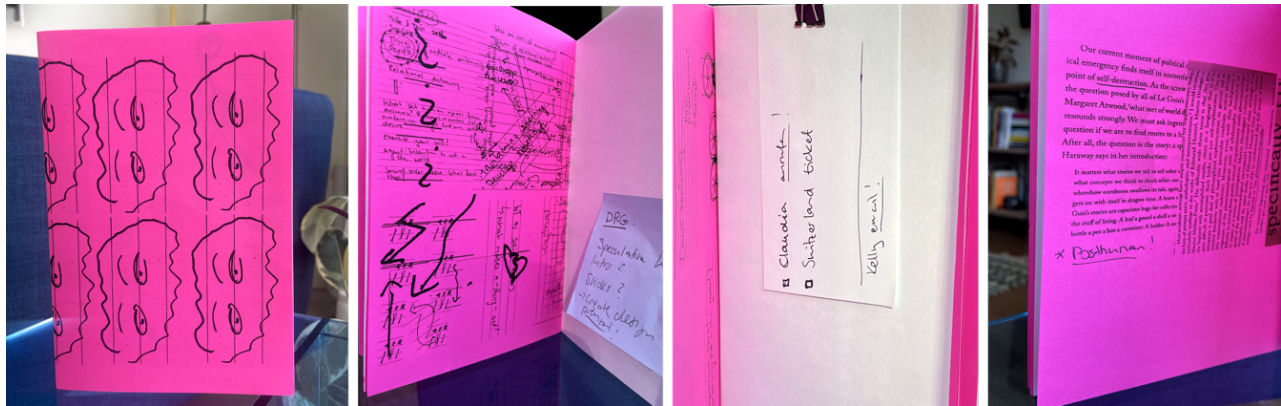


Figure 1: (From left to right) (1a) Cover of the zine archiving all written notes. The cover is a repeated doodle that was part of the data collection. Figure 1b: The left side combines scans from my notebook and an original Post-it note on the right side. Figure 1c: Original note on an index card (short to-do list). Figure 1d: Scan of handwritten notes in the margins of a theory book.

collection, aggregation, and interpretation can serve as a form of resistance against Big Data infrastructures, offering ways to reclaim ownership of the data.

Research on personal data tracking (also known as lifelogging, personal informatics, and the quantified self [21]) foregrounds the sense-making of day-to-day experiences, weaving a narrative that resonates with everyday lives. The ‘quantified self’ concept introduced by Wolf and Kelly in 2007 refers to ‘self-knowledge through numbers’ to monitor biological, physical, behavioral, or environmental data [17]. Recent scholarship in personal informatics [5] has inquired into the systematic collection and analysis of personal digital data to enhance self-awareness and decision-making. Using a critical lens, Sarah Homewood [8] calls for a shift in self-tracking practices toward a balance between removal and engagement. The approach of Small Data complements self-tracking by going beyond the quantitative data often used.

In contrast to prevalent 2D data visualizations in HCI, a design counter-trend is emerging, focusing on engaging multiple senses for data representation. Data physicalization bridges Small Data and personal narratives, encouraging a more embodied and sensory interaction with information. Researchers like Sandra Bae et al. [1] highlight the translation of data into tangible forms to facilitate shared experiences in interpretation. Other works, such as Thudt et al. [22], advocate for hands-on approaches, empowering individuals to actively create tangible data representations. Contributions from Moretti et al. [20] emphasize participatory data physicalization for personalization, while Lupton [18] incorporates touch to create an emotionally resonant experience with personal digital data.

3 METHODS

In this work, we use Research through Design (RtD) [7] and first-person research methodologies [3, 11] to collect and physicalize three sets of Claire’s (First Author) data. We focus on data that may not be considered data (handwritten notes), that may become data in the act of data collection (photos of everyday objects), and that may contrast with other ways of knowing (menstrual cycle data

notifications). We chose these data sets for their personal qualities and how they exist at the edges of what we might consider data. For each provocation, Claire collected data for about one week before transcoding this data into a physical artifact representing the data. Together, Audrey (Second Author) and Claire discussed the data collection, setting, and physicalization. Our analysis focused on the meaning-making that emerged throughout the process and how context (or data settings in Loukissas terms [12]) shaped meaning. From this point onward, ‘I’ is referring to Claire, and ‘We’ to Audrey and Claire.

4 PROVOCATIONS

4.1 Handwriting as a form of Small Data: A window into my daily life

I collected my handwritten notes over the course of six days. Audrey and I are interested in exploring handwriting as a form of Small Data because it is a tangible data trace which can open a window into everyday spaces, thoughts, and activities, and it offer a direct connection to one’s unique writing style, adding a personal touch that is mostly absent in digital context.

We found that this Small Data set offers intimate insights into my life, however, the noted everyday narratives often require context or backstory to be fully comprehend. Capturing snippets of my daily experiences ranged from school and ethical reflections to very mundane notes about my dog—Daisy, and grocery lists. The handwritten notes represent a very clear representation of my life, what is happening around me. Essentially, it is very personal: it is related to me, to me as a person, my everyday life, and my relations.

We decided to compile a zine (Fig. 1a) to give form to this new data set. Some notes were scanned if they existed in a book, while others were the original note on an index card or piece of paper. Through the curation of the notes in the zine, we gave the reader an insight into my life. However, it is never entirely possible for the reader to understand the ‘complete’ context. For example, while comparing a reminder list and a note in a book, we found that context is never fully revealed, even though it might appear that



Figure 2: (From left to right) (2a) Collection of postcards resulting data the physicalization of Pocket life. 2b: Frontside of a postcard with the artifacts and metadata of the image created by my iPhone. 2c: Zoom in the backside of the postcard, showcasing the rest of the metadata and adding information of the artifacts and spatial context.

the ‘call Claudia’ or ‘book flight’ seem to be straightforward (Fig. 1c). The reader does not know the full backstory; they don’t know that I had to call my mother to organize dates in order to fly to Switzerland for my father’s first anniversary of his passing. Without knowing the full story, the sense-making and interpretations remain speculative.

The zine, despite its apparent chaos (Fig. 1b), strategically organizes specific notes, fostering interpretation and speculation due to the randomness of index card placements. While these original notes lack immediate context for clear interpretation, scanned notes from books maintain a connection to their origin (Fig. 1d). The zine’s materialization explores the tension between taking notes out of context and curating them in a way that aligns with my desired perception. This process is crucial for me as it feels empowering to control how others perceive my private life through this intimate data set. We found that, through this physicalization, ownership and representation of Small Data stays with me, I maintain the autonomy and power in my data representation and usage.

4.2 Pocket life: Spatiality and temporality of things

This exploration aimed to see Small Data in a spatio-temporal dimension by capturing photographs of the artifacts I carried in my pockets, bags, or purses. Investigating the temporal and spatial characteristics of Small Data, Audrey and I wanted to push beyond digital data. Moreover, capturing artifacts through photos provided a tangible and visceral representation and allowed for a different exploration of the context, textures, and visual details.

I took one photo per day for eight days with their iPhone camera. For the data physicalization, I designed a set of postcards (Fig. 2a) inspired by the historical tradition of sending postcards to share personal experiences and the format’s inherent structure with distinct front and back sides. The front displays visual elements, and the back provides contextual information, enriching the storytelling experience (Fig. 2b, 2c).

Each postcard symbolizes a single day (Fig. 2a) featuring artifacts from a single photograph. This intentional grouping is significant

as each day unfolds a unique narrative through the objects I carry. I digitally isolated the objects to explore the temporal and spatial aspects, overlaying metadata like file names, dates, and camera details on the front side using Efixtool reader. The reverse side of the postcard includes a sentence about the photo’s location, along with a list of artifacts and the date, offering context (Fig. 2c).

Relating this to our theme of data settings, these postcards materialize a broader narrative, offering a tangible glimpse into the interconnected threads of my daily life. The deliberate artifact grouping for specific dates allows each day to recount a distinct story, highlighting the dynamic nature of experiences. For instance, one postcard depicts a typical school day, while another captures a journey to Arizona. The fusion of technical metadata with personal context bridges the digital-physical gap and infuses the artifacts with a human touch. Notably, the curated narrative challenges assumptions, providing a tailored angle into my life beyond immediate appearances. This intentional curation and contextualization empowered me to guide the narrative, giving ownership and control to the data’s origin.

4.3 Menstruating em(body)ment

Drawing inspiration from Merleau-Ponty’s philosophy on embodiment [19]—who studied the nature of between being and having a body—this exploration starts as a first-person perspective of experiencing life as a playful, sensory menstruating body. A central part of this provocation lies in the relationship between the predictions of the menstrual cycle tracking app ‘Flo’, depicting how “Big Data”—the system’s knowledge—anticipates my emotional and bodily state at a given point in the cycle (Fig. 3a, 3b), and the embodied lived experience of how I truly perceive and feel—referred to as my soft knowledge (Fig. 3d, 3e). The process involves collecting push notifications from the menstrual cycle tracking app (Fig. 3a, 3b, 3c) over eight days, supplemented by handwritten notes recording the context in which I received the notification, my emotional response, and a reflection on how my body felt. This dual perspective is a nuanced narrative, revealing the complex relationship between digital predictions and lived bodily experiences. (Fig. 3e).

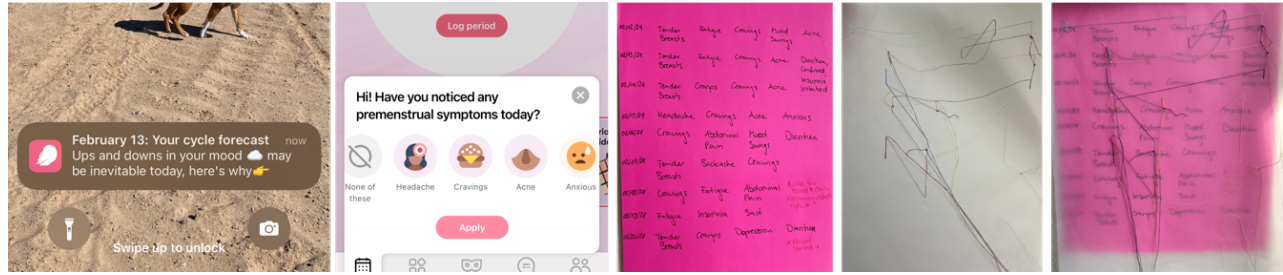


Figure 3: (From left to right) (3a) Screenshot from the push notification about my emotional and physical state. Figure 3b: Screenshot of the interface of ‘Flo’ asking me to log premenstrual symptoms. Figure 3c: Handwritten notes showing the range of daily algorithmic predictions from the app. Figure 3d: Trace paper and thread; each thread color reflects another day. Figure 3e: The overlay showcasing the tension between the algorithmic predictions and my soft knowledge.

The materialization emphasized the discrepancy between receiving notifications from the cycle tracking app (how ‘the system’ thinks I feel) and mirroring this with my own embodied awareness. To show this, I worked with layers of paper, trace paper, and thread to materialize this tension (Fig. 3c, 3d, 3e). With the choice of trace paper to represent the body, and needle and thread to present the self-logged embodied symptoms, I put awareness towards the vulnerability and delicacy of the human form—something the system can never reconfigure. The layer of paper in the background represents the system’s knowledge and algorithmic attempts to interact with the individual experience. The use of thread to physicalize the trace of bodily and emotional symptoms showcases a more dynamic, complex, perhaps even messy, yet soft feeling of experiencing your (menstruating) body.

Choosing materials prompted me to self-reflect on my own body during the materialization process. This provocation illuminates the nuanced backstories of women’s health and embodiment by capturing intimate Small Data from my life. The contrast between push notifications from a menstrual cycle tracking app and personal notes exposed the intricate interplay between systematic, algorithmic predictions and embodied lived experiences (Fig. 3e). Materialized through layers of paper and thread, this tension becomes tangible, raising critical questions about the feelings mediated through technology. It offers a profound understanding of the complex relationship between algorithmic digital predictions and the lived narratives of a menstruating body.

5 DISCUSSION AND PROVOCATION

The central contribution of this work lies in the extension of early definition of Small Data as messy, imperfect, subjective, and local to Data Setting and backstories. By conducting three distinct explorations—handwritten notes, pocket life, and menstrual cycle tracking—the project challenges the conventional understanding of data as discrete and isolated entities (Loukissas [13]) and aligns with Lupi’s perspective on acknowledging the imperfection and subjectivity in Small Data [15].

A crucial aspect of our work is to explore how data settings, or the context in which data is collected and materialized, influences the interpretation and meaning-making of Small Data. The three explorations reveal that the richness of Small Data lies not only in the data points themselves but in the surrounding stories,

experiences, and personal contexts. The materialization of handwritten notes in a zine, the creation of postcards depicting artifacts, and the layered representation of data of a menstruating body through paper and thread all demonstrate a tangible exploration of backstories. They are related to my own perception of data and how this relates to my everyday life. This approach offers a shift from traditional discussions around Big Data and Data Economy, providing a compelling alternative that centers on the personal, the private, and the meaningful. Through the lens of Small Data and backstories, individuals can regain agency and ownership over their data, offering a nuanced means to exercise control over privacy and engage with personal information more intimately. The work thus contributes to the broader discourse in HCI and arts, promoting a reevaluation of the relationships between data, personal narratives, and the lived experiences that shape Small Data. Questions such as: How do tangible mediums like paper and print impact the comprehension and interaction with Small Data? And what insights can be gained from exploring traces and uncovering details in materials typically overlooked or not part of conventional data collection practices? can provide valuable guidance in future exploration.

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