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Bogdanova, Karin

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Aesthetics of algorithmic care

Designing alternative human-AI collaboration practices for digital phenotyping

Karin, Bogdanova

TU Delft

e.bogdanova@tudelft.nl

ABSTRACT

Emergent technology of digital phenotyping (DP) for mental health promises to serve as a window to the lived experiences of patients through the collection and analysis of passive and interaction data from personal mobile devices and wearables. However, the need for standardization, formalization, and interoperability requires DP algorithms to employ generalizable digital biomarkers that convert culturally and socially specific expressions of health, well-being, and illness into uniform, detectable, and quantifiable measurements. Authors critical of DP usually employ ethical and epistemological critique, which often either delegating responsibility or provide limited suggestions. Design and HCI are notably lacking from these conversations and practices. I argue that pragmatic aesthetics, which is focused on experience and perception, could be a generative bridge between philosophy and design for DP. Moreover, newly emerged aesthetics of care could be conducive to developing a more beneficial sensibility of how posthuman (i.e. algorithmic) care could support people with mental distress. These aesthetic theories are inherently intersubjective, thus requiring establishing new collaborative alliances between doctors, patients, and technologies, as well as cultivating new care practices and mind-body-technology relations.

CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); HCI theory, concepts and models.

KEYWORDS

Digital mental health, Care, Design Aesthetics, Psychiatry

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1 INTRODUCTION

The increasing demand for the improved availability, accessibility, and efficiency of healthcare services endorsed extensive innovation through artificial intelligence (AI) - including digital mental health. The most cutting-edge emergent technology of digital phenotyping

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in turn promises to open a window to the lived experiences of patients through the “non-invasive” collection and analysis of passive and device interaction data from personal mobile devices and wearables. Such data would generate “objective measures” of mental health, which would produce an aggregation of additional information (ultimately viewed as health-related) in order to produce more accurate and early diagnoses.

Alongside technical limitations, ethical concerns regarding this emerging technology have been the main causes for its slow development and implementation on a large scale: questions of data ownership, accountability, and privacy remain unaddressed [1]. However, beyond the conventional data ethics considerations, philosophers and social sciences have also challenged the epistemology and methodology of digital phenotyping (e.g. [2], [6]). As a result, there is a valid concern about the need for standardization, formalization, and interoperability requiring digital phenotyping algorithms to employ generalizable digital biomarkers that convert culturally and socially specific expressions of health, well-being, and illness into uniform, detectable, and quantifiable measurements.

However, whenever the questions of ethics are raised, they often remain very narrow and, therefore, either mentioned in the digital phenotyping research papers as an afterthought, delegated to governance and policy (around AI specifically), or responded with no actionable suggestions. Taking that in consideration, I argue that, firstly, focus on ethics (and especially only data ethics) is insufficient to address the possible harms of digital phenotyping and take advantage of its transformational potential. Secondly, if those issues are to be addressed, digital phenotyping systems require design intervention—while the technology is still emergent, and its form is still flexible and unstabilized. Design, as understood here, is necessary to understand the needs of users and relations within users’ care ecologies and thus define affordances, functions, and interactions. Thus, the perspectives of clinical researchers and technologists, while acknowledged, are decentered.

2 PROBLEM STATEMENT AND RESEARCH QUESTION

Despite conventional data ethics concerns (such as privacy, confidentiality, accountability, explainability, bias, etc.) being valid and relevant for the design of digital phenotyping systems, there is a set of socio-political and design issues that are not addressed properly by ethics framing. These are the following:

• Digital gaze

Digital gaze suggests that complete objectivity can be gained through the increase in ubiquity and volume of data collected. Digital data is thus argued to enable access to “deep” physiological, behavioural, and social truths”, unattainable otherwise [15]. Moreover, digital phenotyping proponents seem to suggest an explicit

epistemic link between biological, social, and digital [2][15]. These commitments paint digital phenotyping systems as driven by positivistic and reductive methodologies that present a danger of reifying mental health conditions as biological.

- Epistemic intervention into the interpretation and experience of mental health

Digital phenotypes “reduce the person” [8], as all behaviours have the potential to be read as “a symptom” by an AI. Therefore, digital phenotyping systems can co-constitute experiences of the self, one’s body and mind, as well as affect thoughts and actions (in particular, how they are interpreted). The users themselves can engage in performative acts to encourage desired effects in the data—whether consciously or not. The developers of digital phenotyping systems need to be very mindful of how the epistemics of mental health conditions are engaged with, explained, and presented to the user.

- Contentious positionality of the user/patient

Taking into consideration that this technology remains emergent, the risks for the user/patient significantly overbalance the benefits at this point, as the prospects of surveillance, discrimination (especially following the profiling), overdiagnosing, and pathologisation prevail [8]. Furthermore, digital phenotyping proponents seem to engage in a “curative imaginary” [12] that assumes that the risk of disability and death makes intervention obligatory, thus legitimising any means that would facilitate mitigation or elimination of that risk. This way, some people could be expected to forgo their autonomy and privacy for “care” to be provided.

- The conflict between the need for standardisation and sensitivity to context

While the digital phenotyping proponents claim that the systems allow both a window to “lived experience” and ultimate objectivity, those two statements present a conflict. Standardisation is required both technically (in terms of integration of multimodal data; interoperability between platforms and systems; precise definition of digital biomarkers, their development, and detection) and clinically (in terms of establishing standardised expressions and interpretations of digital behaviour and mental health states, as well as specific patient journeys enabled by digital phenotyping). At the same time, the need to acknowledge complex socio-cultural contexts of said “lived experience” in data analysis creates a significant challenge to standardisation. Current psychiatric practice formally requires cultural competencies for mental health professionals to take into consideration a variety of cultural idioms of distress, culture-bound syndromes, and diverse articulations of mental health during diagnostics and management decisions [4].

With this project, I argue that the omission of these concerns prevents digital phenotyping-based healthcare from providing appropriate and *good* care. Implications of these issues are complex, multi-faceted, and dynamic; they are as clinical, as they are political. Therefore, my key research question is: ***How can digital phenotyping systems be designed to cultivate practices of good algorithmic care?*** I propose aesthetics as a more fitting perspective for the AI-driven design for digital mental health – especially, pragmatist aesthetics and aesthetics of care.

3 AESTHETICS AS A DESIGN INTERVENTION

3.1 Aesthetic reframing

The pragmatist perspective uncouples the field of aesthetics from its almost synonymous identification with art theory and returns to its Ancient Greek definition as referring to the realm of the sensible, perceivable, and experienced [3]. It thus shifts the focus from aesthetic object to aesthetic experience, which is contextual, relational, and socio-economically and politically contextualised [7]. Pragmatism reframes aesthetics as dealing with sensory and affective knowledge, claiming sensing and sense-making as inseparable processes. Furthermore, the legacy of Deweyan pragmatism asserts the interdependency of the ethical and aesthetic. While not explicitly claiming the association, aesthetics of care shares most of pragmatism’s commitments and, importantly, spotlights the moral component of aesthetics. As Saito [2022] declares, there should be a closer exploration of “ethically grounded aesthetics and aesthetically guided ethics”. Crucially, Saito continues, this program is enabled by designed conditions and encounters facilitating aesthetic and moral experience (of care, in this instance). As such, pragmatist aesthetics’ orientation towards materiality, experience, and interaction allows for such a framework to be more easily grasped by designers, and thus translated into design specifications (especially, HCI) [10]. In particular, in developing digital phenotyping systems, designers need to address the following domains: perception (including algorithmic perception), representation (interfaces), experience (mental health models), and ecologies (relationality of care). Aesthetics does not just make a bridge between philosophy and design but renders philosophical concerns as design problems.

3.2 Diagnosis as intersubjective and collaborative

Mental health diagnosis requires outstanding aesthetic skills from both the (potential) patient and the therapist. The former needs heightened sensory capacity to detect the symptoms and articulate them; the latter needs to get attuned to the expressions of distress and determine what can constitute evidence. Psychiatric diagnostic reasoning can already be understood as intersubjective knowing [9]. With those processes being as complicated and contestable as they are, the intervention of the artificial agent in those relations should not be taken for granted. For instance, digital phenotyping pioneer Thomas Insel [2019] claimed that patients increasingly “realise... they cannot trust their subjective experience”. While clinicians’ diagnostic perception and reasoning are treated with less distrust, their bias is said to interfere with making suitable clinical decisions as well [14]. In this context, algorithms thus could be conceived as aesthetic agents. In the processes of labelling and training, they also acquire skills to perform aesthetic judgments that might be different from the ones made by humans. AI should be seen as a “co-interpreter” of the diagnosis, rather than a neutral supporting tool [13]. With the aura of objectivity that is assigned to big data technologies, the power in making diagnostic decisions could be tilted towards AI. Meanwhile, this process often remains black-boxed, obstructing the possibilities for intersubjective interpretation, deliberation, and contestation.

The pragmatist perspective refuses ontology, arguing that the meanings and interactions emerge through dynamic relationality. Additionally, instead of discoverable stable “truth”, pragmatists foreground “ways of knowing” and “useful truths” [7]. Identifying what they are might be better alternative goals for digital phenotyping-based diagnosis and treatment. Yet, they have to be established collaboratively. Cila’s [2022] methodology of human-agent collaboration suggests a practical guide to establish a relationship where all actors have input in producing mental health knowledge (including sensory) and organising care labour.

4 METHODOLOGIES

The posed research questions will be addressed by interdisciplinary research and practice. This project primarily borrows from aesthetics theory and critical HCI but also engages with medical anthropology and science and technology studies. The steps in completing the project are as follows: 1) define and outline the proposed aesthetics-based design framework; 2) collect qualitative data from multiple stakeholders: developers, therapists, and (potential) users; 3) elaborate and provide design specifications.

In the interviews with interviewers, I will attempt to unravel more informal narratives, visions, hopes, and fears among the developers of the digital phenotyping systems. While scientific papers on digital phenotyping suggest a theoretical view of how it can be implemented, developers might indicate whether practically those aspirations are realistic and comprehensible. Based on previous informal conversations, there is evidence to suggest that developers—as stakeholders less strictly tied to institutional environments—might suggest an even more transformative and “disruptive” approach to digital mental healthcare altogether. Furthermore, applied aesthetics decisions and practices (regarding algorithm design, affordances, and interfaces) will be elicited.

Therapists in turn will provide a professional perspective informed by their direct interactions with the patients. In particular, I will be paying attention to aesthetic skills of sensing and sense-making of expressions of (ill) mental health and the possibility of expertise sharing with AI. As of now, it is not expected that therapists would use any AI technologies in their work, so the collection of data will be facilitated with sensitising objects or provotypes. The methodology for the next group of interlocutors, (potential) users, will largely be influenced by the data collected before that point. Yet, it is expected that an experimental (design) ethnographic approach will be used.

The final paper will compile analytical and empirical data collected to further strengthen the theoretical proposal outlined in the first publication and provide design specifications for aesthetics-based framework for digital phenotyping.

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