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Epistemic inequality in the digital era: Unpacking biases in digital mental health

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I. Introduction

Rising health costs and the politics surrounding public health in both the Global North (Kulkarni, 2016) and the Global South (Wagstaff et al., 2018) increasingly push individuals to take charge of their health (Sharon, 2017). The rise of global e-health initiatives (Sujatha, Ephzibah, and Dharinya, 2020) is driven by expectations of a technological future, some of which may be experimental or prophetic (Tare and Garge, 2020). Our manuscript focuses on the field of digital mental health and its biases in technical, social, and political systems. Using Frantz Fanon's analysis of colonial identity (Fanon, 1952), it explores how these technologies might extend identity and cultural hegemony, highlighting inherent biases and social implications.

Digital mental health can be defined as the use of digital technologies such as mobile apps, wearable devices, and online platforms for the prevention, diagnosis, and treatment of mental health conditions (Torous and Hsin, 2018). With over 10,000 health applications on leading mobile platforms in the Global North (Carlo et al., 2019) and thousands of m-Health projects being deployed in the Global South (Cinnamon and Ronquillo, 2018), proponents of mobile technologies believe they hold great potential for mental health metrics. These metrics, based on artificial intelligence (Torous and Hsin, 2018), rest on the idea that certain changes in voice, typing, or physical movement can be indicative of mental health conditions such as stress, anxiety, and depression. For instance, research has shown that changes in typing speed, accuracy, and pressure can be indicative of stress, anxiety, and fatigue (Ha, Madani, and Adib, 2021). Voice tonality can be analyzed using speech recognition technology to detect changes in pitch, volume, and rhythm, thus detecting sadness, excitement, or levels of engagement with a task (Egger, Ley, and Hanke, 2019). Wearable technology, such as smartwatches or fitness trackers, can be used to monitor an individual's physical activity levels and mobility patterns, and to assess the impact of stress and anxiety on an individual's sleep patterns or their ability to perform everyday tasks (Hickey et al., 2021). However, there are several obstacles to the digital shift in mental health,

including the neo-colonial workings of the global economy, biases embedded in technology, and the disenfranchisement of psychological therapeutic approaches. Applying Frantz Fanon's critique, these technologies may reflect colonial dynamics, imposing Western-centric mental health models and overlooking cultural differences in mental health expression (Fanon, 1952; 1961). This mirrors colonial identity imposition and raises concerns about cultural bias, echoing Fanon's analysis in "Black Skin, White Masks" and "The Wretched of the Earth."

Our analysis aims to reflect on the discourse around mental e-health in the age of global connectivity and shed light on the ontological and political premises behind digital mental health technologies. While confidentiality (Karkazis and Fishman, 2017), surveillance (Liddle et al., 2016), privacy (Martinez-Martin et al., 2018), covariance vs causal explanation (Neto, 2020), and the physician/patient relationship (Cohen et al., 2021) are widely discussed in the literature, many of these discussions are centered in the Global North (Anonymous, 2021). This article, drawing from science, technology, and society studies and postcolonial studies, examines the ecosystem of digital mental health technologies and challenges assumptions about psychological normality and algorithmic bias. We specifically explore AI and machine learning in mental health, differentiating them from broader digital health tools to highlight unique biases and ethical issues. Behavioral theories widely used in health promotion (Lupton, 2012) have been criticized by social science researchers for perpetuating systemic inequalities and placing the blame for health on individuals away from institutions (Ajana, 2017). The discourse surrounding global e-health, whether academic (Rayan, 2020), institutional (World Health Organization, 2020), or commercial (Oderanti and Li, 2018), is indeed optimistic, but we must question the top-down design of mental health technologies. Having a small group of engineers from the Global North imagine, design, and program our digital infrastructures poses the risk of embedding their worldviews and biases into the tools. Fanon's analysis of colonial identity (Fanon, 1952) can be applied to e-health solutions. Through Fanon's perspective in 'Black Skin, White Masks', we see how these technologies, rooted in Western epistemologies, might overlook or even suppress diverse cultural mental health conceptualizations (Fanon, 1952). This imposition of a Western-centric mental health model mirrors the colonial identity shaping Fanon critiqued, suggesting a form of digital colonialism. Fanon's insights are vital in recognizing and challenging these cultural biases, urging us to scrutinize how digital tools might perpetuate a new colonial dynamic, as discussed in 'The Wretched of the Earth' (Fanon, 1961).

Fanon's criticism of Mannoni's psychology of colonialism (Vaughan 1993) deconstructs colonial ethnopsychiatry and advocates for a novel approach to difference. He argues that differences should be acknowledged along with the context and the political relations of social actors. Fanon's work marks a milestone in the analysis of psychological suffering, the splintering of the imagination, and the fragmentation of memory within a political, historical, and cultural context. As we will explore in the next section, his writings on violence, torture, and the contradictions of post-colonial societies can be seen as a kind of prophecy for the digital age in mental healthcare.

The culture of digitality and the global digital networking of the world calls for a global postcolonial perspective concerning the political misuse of scientific achievements to strengthen industrial rather than personal and social flourishing (Pavitt, 1988). Given this, we consider the ethical issues emerging from digital mental health technologies – notably, the risk of seeing individualized digital healthcare acting as a smokescreen to obscure systemic problems. We also examine the cultural biases in psychological assessments, drawing from Frantz Fanon's critique (in Hook, 2012), and the disciplinary biases and contradictions of psychology and psychotherapy incorporated into digital health tools, which have historically been used to generalize across cultures (Fricker, 2017; Bueter, 2019). The euphoria surrounding e-health implies reduced healthcare costs, increased patient engagement (Nisha, Iqbal, and Rifat, 2019), horizontality,

universal access, performance, and patient empowerment. These are the stated objectives in both the public and private sectors, which will act as powerful levellers between the haves and have-nots, the diseased and the healthy. The euphoria, however, turns a blind eye to the potential for digital technologies to reinforce existing inequalities. This article critiques cultural and disciplinary biases in psychological assessments and digital health tools (Hook, 2012; Fricker, 2017; Bueter, 2019) and questions the euphoria around e-health's promise for reduced costs and increased engagement (Nisha, Iqbal, and Rifat, 2019), highlighting how it may ignore underlying inequalities. Our article concludes by offering elements of a viable and ethical solution while also recognizing the potentials and limitations of digital mental health technologies. The framework of analysis identifies the multiple sites of power in which mental health technologies are situated, highlighting the need for ethical considerations in the development and deployment of these tools. By examining the discourse, cultural biases, and political premises of digital mental health technologies, this study aims to shed light on the ways in which these technologies can perpetuate and reinforce existing power structures and social inequalities. It proposes a framework for ethical digital mental health solutions, emphasizing the importance of recognizing power dynamics, cultural biases, and ethical implications in the development and use of these technologies, aiming to mitigate reinforcement of social inequalities.

II. Mental e-health and digital neocolonialism in the global context of the knowledge economy

This section aims to explore how mental e-health intersects with digital neocolonialism, which refers to the ways in which the domination of the Global North over the Global South is perpetuated or intensified through digital technologies. We argue that mental e-health cannot be fully understood without considering its political and societal dimensions, and how different types of knowledge are involved in its design, implementation, and regulation. Specifically, we examine how Rosa's (2019) concept of resonance—where individuals seek meaningful connections with self, community, nature, and the broader cosmos—can be applied to understand and shape mental e-health practices. This framework provides a lens to analyze the impact of digital mental health tools, focusing on three critical areas: colonial legacies and imaginaries that persist in digital technologies, the Global North-centric design that often overlooks local contexts and needs, and the dominance of psychology as the primary science informing mental health technological innovations. These areas are pivotal for several reasons.

Rosa's framework emphasizes the need for resonance with one's cultural and historical identity. Colonial legacies disrupt this resonance by imposing external values and systems that may not align with local traditions and beliefs (Fanon, 1952; 1961). Understanding how digital mental health tools perpetuate these legacies helps us create technologies that respect and incorporate local cultural contexts, fostering a more authentic connection and better mental health outcomes (Cinnamon & Ronquillo, 2018). Rosa underscores the importance of community and social connections. A Global North-centric design often overlooks the unique needs and contexts of communities in the Global South, disrupting social resonance (Mouton & Burns, 2021). By addressing this, we can develop digital mental health tools that are more inclusive and responsive to the diverse needs of global communities, enhancing their effectiveness and acceptance (Rasendran, 2019). Resonance with nature and the broader cosmos, as well as the self, requires acknowledging multiple ways of understanding mental health beyond the dominant psychological paradigms. The current dominance of psychology, particularly from a Western perspective, can marginalize alternative epistemologies and therapeutic practices (Conrad & Leiter, 2004). Rosa's framework suggests that integrating diverse perspectives can lead to a more

holistic and resonant approach to mental health, accommodating various ways individuals make sense of their experiences (Hunt & Jaeggi, 2022).

These areas are essential to understanding the landscape of mental e-health. By applying Rosa's concept of resonance, we can ensure that digital tools not only address clinical needs but also foster meaningful and culturally sensitive connections, ultimately contributing to better mental health outcomes. Understanding digital mental health and neocolonialism requires acknowledging capitalism's widespread impact. Zuboff's surveillance capitalism concept reveals the digital age's commodification of personal data, making mental health data a valuable asset (Zuboff, 2019). This commodification raises questions about the underlying motives of digital health technologies: are they primarily for patient care or for profit? Further, McKenzie Wark's inquiry into whether our current state represents an evolution of capitalism or a new, more concerning paradigm (Wark, 2019) is particularly relevant. Wark's perspective challenges us to critically examine whether these technologies represent traditional capitalist expansion or a novel form of exploitation, marked by unprecedented levels of surveillance and data commodification. This debate adds an essential layer to understanding the complexities of digital mental health in a capitalist society. In this light, the field of psychiatry, often intertwined with digital health industries, finds itself at a crossroads between patient care ethics and capitalist incentives, a tension that must be critically examined.

Mental health policy lends itself particularly well to scrutinizing the mechanisms of public action, as it involves complex and dynamic debates, reforms, and contestations regarding the provision, funding, and regulation of services (Waldron, 2010), impending reforms (Levin and Levy, 2020), and the diversity and conflictuality of the types of knowledge at stake (Rose and Kalathil, 2019). Moreover, mental health policy encompasses multiple forms of knowledge that often intersect and conflict, such as biomedical, psychological, social, and cultural knowledge (Rose and Kalathil, 2019). In this sense, mental health policy reflects broader tensions and transformations in the knowledge economy, where intangible assets and intellectual property have become crucial drivers of growth and competitiveness (Jona-Lasinio and Meliciani, 2018).

The knowledge society, as coined by Drucker (1993) and elaborated by Kabir (2019), emphasizes the importance of investing in education, research, innovation, and coordination to generate and disseminate knowledge. These investments form the intangible capital of the economy, which is increasingly vital for sustainable development and societal well-being (Sturzoiu, 2016). In this section, we explore how mental e-health policies and practices relate to the production, circulation, and governance of knowledge in the knowledge economy, and how they reflect and shape broader power relations and ethical values. At the crossroad of science, technology, healthcare, and the knowledge society, e-health is positioned to be a key determinant of global wellbeing in the 21st century. The now commonplace concepts of "knowledge society" and the "knowledge economy" (Powell and Snellman, 2004) thrive alongside the even more popularized concept of the "information society" (Martin, 2017). The success of these terms should not exempt the social sciences from interrogating them. Does this mean that society will be solely governed and shaped by knowledge? Or could pluralistic knowledge foster collective action and progress? In the field of e-health, the knowledge society has often been associated with a tendency toward expansion, masculine norms (Walby, 2011), and a predisposition towards expanded globalization (Jimenez, Solanas, and Falcone, 2014). While the knowledge society promotes the sharing and dissemination of knowledge, the optimism about globalization has waned in recent years (Nagla, 2010). As Bilić, Prug, and Žitko (2021) argue in their study of "The Political Economy of Digital Monopolies," the privatization of knowledge leads to unequal distribution of wealth from technological innovation, often funded by public investments. This results in growing income disparities in capitalist centres where tech giants like GAFAM

(Google, Apple, Facebook, Amazon, and Microsoft) are based, as well as in peripheral countries where GAFAM secure a significant share of their revenues (pp. 157-158).

1. The Global North

In 2021, internet access reached 59.5%, connecting billions of people worldwide, and cellular network coverage spans over 95% of the world's population with over 7 billion subscriptions (Sanou, 2017). These new technologies offer potential for creating sustainable and durable tools to promote health, especially in areas lacking personnel and infrastructure. However, despite progress made towards the Millennium Development Goals and Sustainable Development Goals, health inequalities persist, particularly in the Global South, with maternal and infant mortality being prominent indicators (Nakamura, 2019). As e-health is a product of the internet, it reflects similar North-South inequality challenges. The digital divide is thus renewed in the field of remote mental health care.

While e-health technologies hold great potential for promoting health in areas with limited personnel and infrastructure, their implementation has highlighted existing disparities in access to healthcare, particularly in the Global South where delays hinder medicalized treatment of mental health (Mauco, Scott, and Mars, 2020). In contrast, developed countries have already established mental e-health within their healthcare systems (Rasendran, 2019). However, the concept of medicalization (Conrad, 2007) raises concerns about the power structures and discrimination perpetuated by medical professionals who pathologize and intervene in certain characteristics or conditions, potentially reinforcing societal norms related to productivity, conformity, and heteronormativity (Conrad and Leiter, 2004). Thus, critical examination of medical practices and patient-centered care are crucial for addressing these issues. Medicalization as a concept refers to the technical sphere where the doctor-patient relationship tends to be replaced by a more „consumerist“ type of relationship and is reflected in the rise of health concerns across populations (Conrad and Leiter, 2004). The idea of medicalization is often associated with the increasing use of medical technologies and a focus on treating medical conditions with drugs or other interventions. Conrad and Leiter (2004) suggest that this trend is driven by scientific progress and the growing importance of functional and technical aspects of medicine. An important aspect of medicalization is the phenomenon of „the medicalisation of difference“ (Gilman, 2000). This term refers to the way in which medical professionals often view certain conditions or characteristics as abnormal or deviant, and therefore in need of medical intervention. This can result in the pathologization of individuals who do not conform to societal norms, such as those who identify as LGBTQ+, have non-binary gender identities, or have disabilities.

Medicalization and the „the medicalisation of difference“, however, are not only influenced by social norms but also by the broader socioeconomic and political context. The neoliberal system that prioritizes productivity and certain skills over others, such as communication and social interaction, may contribute to the medicalization of autism and other conditions – conditions we may as well have chosen to call „specialized minds“ instead of - conditions (Hunt and Jaeggi, 2022). Meanwhile, when examining certain traits like autism and psychopathy, there is a general consensus on the costs and benefits associated with them. Thus, medicalization and the medicalization of difference can be seen as a reflection of the values and needs of the dominant social and economic system, rather than as objective scientific facts. However, both endogenous (psychological and biological) and exogenous (social, economic, cultural, political) factors influence physical and mental health determinants. Persistent socio-economic pressures, such as poverty and low levels of education, are recognized risk factors for mental health conditions. Therefore, health is not only about individual access to treatment, but also about designing political, economic, and social policies that improve living conditions and reduce risk factors. It is

crucial to create a society that respects and protects basic civil, political, socioeconomic, and cultural rights, which are integral to promoting mental health through intersectoral strategies. These technological advances also highlight the issue of the digital divide based on older premises of neocolonialism.

The relative material wealth of developing countries is far behind that of countries with developed economies (Alekseev et al, 2018). Research and development in developing countries is geared towards the needs of wealthy countries, and the resulting knowledge is protected by a legal arsenal of patents, industrial secrets, and national security restrictions (Duan, 2020). This has only served to widen the North-South divide (Drahos and Braithwaite, 2017). In light of this situation, we must ask whether companies from emerging countries can ever enter global oligopolies, especially given that research capabilities in these countries may be limited by a strong brain drain and economic policies that prioritize neoliberal deregulation (such as privatization and foreign acquisition of local companies) (Cohle, 2019).

E-health development is largely driven by wealthier countries, focusing on wellness, chronic disease, and elderly care. In contrast, poorer countries prioritize basic health needs, such as access to primary healthcare. Digital solutions must align with local infrastructure and address specific population needs. Sustainable initiatives should integrate into existing public health projects and adopt a transversal approach that addresses education, employment, justice, housing, environment, and social protection to indirectly reduce mental illness. The North's domination over the South through colonization and neo-colonialism is well-documented (Fanon, 1994; Chibber, 2014; Kim et al., 2017). Globalization has led to increased migration from the South to the North, driven by conditions created by the North (Dutt, 2017). This migration highlights the delocalization of economic, financial, moral, and legal components, making the concepts of center and periphery obsolete. However, migrants are not a homogenous group regarding mental health risks, and further research is needed to understand factors such as motivations for migration, distance from the country of origin, religion, language, and legal and social recognition in the host country.

The rise in digital literacy among certain demographics exacerbates the accessibility gap in digital mental health, particularly affecting non-English speakers and lower-income individuals (The Lancet, 2017). Self-tracking technologies, while informative, often prioritize experiences of specific social groups, fostering an idealized 'active' citizen image (Lupton, 2016). This focus marginalizes those not engaging with these technologies, reinforcing societal biases. Joy Buolamwini's concept of the "coded gaze" describes the embedded views propagated by those who code systems, whose perceptions are not neutral but historically and socially situated (Tucker, 2017).

2. The Coders behind the Industry

A major challenge for AI in mental health technology is the occurrence of biases in classifications and predictions made by AI algorithms due to the top-down approach in their design (Battaglia et al., 2018). These biases have serious consequences, especially when used in decision-making. AI-based systems tend to follow the letter, rather than the intent, of the coder's instructions, lack minimum moral constraints, have a narrow view of the world through data, and often lack broader contextual understanding, thus amplifying inequalities (Ragnedda, 2020). Birhane (2021) explains that data science and practices embody rationalism in various forms that do not tolerate ambiguity, uncertainty, and messiness, have binary thinking, sever data from emotions, and adopt a dominant "God's eye view." Questions of privilege and oppression are viewed as issues that data sciences need not be concerned about. The inheritance of rationality in data sciences and computation makes these fields inadequate to deal with complex and

indeterminate phenomena, and the AI industry, grounded in rationality, reproduces harmful and discriminatory outcomes.

Furthermore, there is no official regulatory structure evaluating mobile applications dedicated to health (Psihogios, Stiles-Shields, and Neary, 2020). In the absence of regulatory oversight, developers are not compelled to address the quality and representativeness of the data they use. This often results in AI systems being trained on biased datasets, which fail to accurately reflect the diversity of the populations they are intended to serve. AI systems require data to function, and if there is less or poorer data on disadvantaged groups, the systems will likely perform poorly for them. Harmful biases, particularly regarding race, gender, or disability (Lloyd, 2018), can perpetuate cycles of inequality due to barriers like access to healthcare, economic and geographic obstacles, linguistic barriers, loss of trust, or data silos. Data can either be biased and fail to reflect the world accurately or reflect an inherently biased world. Machine learning recommendations can significantly impact individuals and groups, potentially perpetuating and reinforcing biases. For instance, the lack of diversity in datasets used to train voice recognition models leads to an "accent gap," resulting in less accurate recognition for underrepresented communities (Geary-Teeter and Hosseini Ghomi, 2020). In 2015, Amazon's AI recruiting tool preferred male candidates because past hires were predominantly male, highlighting a gender bias issue (Vardarlier and Zafer, 2020). In the same year, Google's AI failed to distinguish Black people from gorillas due to racial biases in image selection (Avellan, Sharma, and Turunen, 2020).

Biases in AI can be categorized as processing bias, linked to the non-representativeness of datasets, and cognitive or implicit bias, rooted in human factors and harder to detect (Sargent, 2021). Cognitive biases from developers directly influence machine learning models and training datasets, encoding these biases into algorithms. Incomplete data can also create biases, especially when information is omitted due to cognitive bias. Detecting and removing biases is crucial for ensuring the fairness and ethical use of machine learning models. Globalization will necessitate new arrangements in mental health services, including the integration of mental health services into primary care and the development of multidisciplinary approaches to diminish biases and enhance caregivers' skills and cultural sensitivity (Bacigalupe and Askari, 2013). However, mental health services and technologies remain largely dependent on instruments and methods developed in the North, including psychological assessments embedded in mental e-health technologies. To effectively address mental health issues, a culturally sensitive and multidimensional approach is required, one that accounts for the variety of individuals' experiences and involvement in care. This approach should integrate culture while preserving subjectivity. The "clinic of Otherness" (Nierenberg, n.d.) represents a desirable pathway that advocates for a genuine and positive approach, differing from the "medicalization of difference," by acknowledging the value of subjectivity and cultural diversity.

Can mental triage technologies and e-health apps be expected to produce this approach and contribute to an authentic dialogue of cultures? Will they be able to respect the unique approaches of different cultures towards dealing with certain disorders, or will they remain ethnocentric and colonial? Furthermore, is psychology as a discipline permeable enough to allow for alternative epistemologies to bring about a transformation of the clinical perspective on mental health? By integrating Rosa's framework, digital mental health tools can move beyond mere technical solutions to become instruments that promote genuine cultural sensitivity and equity. This approach can help ensure that these technologies do not perpetuate existing biases but instead foster a more inclusive and just mental health landscape.

3. Psychology as epistemological disenfranchisement

After colonization, Western domination continued through economic, political, and cultural means (Kim et al., 2017), including in the development of technology (Mouton and Burns, 2021). When AI-based technology is combined with therapeutic inputs from Western psychology, it can reinforce unequal power relations and create a tighter apparatus of control (Cohen, 2003). The intersection of economic interests and knowledge has led to the technification of academic practice, including in psychology (Parker, 2009; Anonymous, 2019). Researchers who challenge conventional psychological thought, such as those in radical psychology, liberation psychology, and critical social psychology, as well as the work of the Frankfurt School and critical studies of Foucault, Arendt, and Voegelin, highlight the need to examine the backgrounds of those who develop therapeutic approaches in mental health on e-health platforms supported by artificial intelligence and those who produce standards and regulations (Billig, 1996; Cooper and Voegelin, 1999; Beattie, 2019). Few of these individuals come from the Global South, meaning their experiences and insights are not represented, perpetuating biases (Alekseev et al., 2018), as suggested by feminist standpoint theory (Harding, 1997).

In his criticism of Mannoni's psychology of colonialism, Fanon deconstructs colonial ethnopsychiatry and advocates for a novel approach to difference (Vaughan, 1993). He argues that differences should be acknowledged along with the context and the political relations of social actors. Fanon's work marks a milestone in the analysis of psychological suffering, the splintering of the imagination, and the fragmentation of memory within a political, historical, and cultural context. As we will explore in the next section, his writings on violence, torture, and the contradictions of post-colonial societies can be seen as a kind of prophecy for the digital age in mental healthcare.

3.1. Oppression and mental illness

Fanon's analysis of the role of culture in the reproduction of subordination and power relations underscores the need for a more nuanced understanding of mental health and its treatment in different cultural contexts (Mouton and Burns, 2021). The clash between traditional culture and modern psychotherapeutic practices observed by Fanon in Blida¹ highlights the importance of cultural sensitivity and the necessity for multidimensional approaches that consider the cultural backgrounds and experiences of both patients and caregivers. Furthermore, Fanon's critique of complicit medicine, which ignores the violence of colonialism, calls for a critical examination of the historical and political contexts that shape mental health practices and institutions. Ultimately, Fanon's work challenges us to rethink our assumptions about mental health and to develop more socially and culturally responsive approaches that address the root causes of psychological suffering.

Psychology, rooted in a colonial context, has historically focused on identifying universal laws of human behavior through observable data and constant comparisons between phenomena (Bhatia, 2002). To achieve this, psychology has favored the experimental approach, which involves strict control of variables (Anonymous, 2018). However, this methodological choice tends to segment the individual, isolate their responses, and deprive them of subjectivity, sociality, and environmental context, resulting in a "misquantified self" (Moore and Robinson, 2016). Classical psychology, except for clinical and psychoanalytical orientations, assumes an objectivist, experimentalist, and rationalist stance, which ignores cultural diversity and the singularity of human behavior. This approach hinders the study of complex psychological

processes mobilized by humans in their daily activities. Consequently, a "techno-psychology" has emerged under the influence of other disciplinary models, leading to the discipline's fragmentation into several centrifugal psychologies due to a lack of an overall vision and analytical grid. However, for advocates of critical science, the issue is not the scientific approach per se, but rather the progressive abandonment of the principle of methodological plurality and its social usefulness, as well as the technological drifts that obscure the role of power in the social sciences (Haraway, 1988). Moreover, the drive for isolating variables to explain reality has gone so far in the theoretical imaginary that it is now replacing lived reality without sufficient justification (Teo, 2012). There is a risk of creating an orthodoxy of scientific discovery that dictates a single path to knowledge.

Psychology, a field that originated in the Judeo-Christian West (ap Iorwerth, 1985), faces the challenge of adapting to globalization, changing applicability, and incorporating local knowledge of psychological processes. While psychologists often avoid the idea of culture, it is crucial to acknowledge that different patterns of socialization shape one's personality and identity. Culture can be understood as a system of referral and legitimization that individuals internalize as an integral component of their psychological structure. Despite the rejection of essentialist views of culture in contemporary anthropology, cultures provide meaning and purpose to individual identity and ways of life. The impact of culture on cognitive functions, reasoning, and the development of forms of intelligence associated with know-how, capacities, attitudes, motivation configurations, and social skills has yet to be fully defined.

Cultural heritage is reflected in our behavior, and while migration or other factors may significantly alter our ways of being, cultural processes are embedded within the nervous system. There exists an intricate relationship between culture and neurology, as supported by Xu et al. (2023), who demonstrate that culture significantly shapes spontaneous brain dynamics, highlighting distinct neural features among Chinese versus Canadian subjects. Northoff (2021) discusses how cultural factors are actively encoded within our neural circuitry, emphasizing the brain-culture complexity.

In mental health, representations of mental illness and care are central to therapeutic practices, which are deeply influenced by cultural values (Sue & Sue, 2015). These practices shape the development of goals and aspirations, ensuring that therapeutic approaches conform to the cultural norms and expectations of the society they serve.

There is a need to consider psychological knowledge found in various cultural and religious traditions, examining its conceptualization and the theories derived from it to explore the cognitive world and the theories of human nature it conveys. For example, Buddhism provides a highly elaborate psychological understanding of suffering, mental processes, and operational concepts. However, the ethnocentrism of Western scientific knowledge tends to undermine its validity, despite its sincere aspiration to empirically apprehend the nature of reality and the human mind. Human biology and behavior are co-produced by culture, and mental health services must accommodate such diversity. Sociocultural processes determine the mechanisms of mental illness, the symptoms of suffering, and the ways of coping with mental illness, including seeking help. Health care systems mirror culturally based representations of body schema, the self, and identity rooted in distinct ontologies. While universal aspects of biology might be thought to trump cultural influences in the face of severe illness, the mental illness-induced crisis is grounds for mobilizing cultural knowledge and systems of representations that formalize the course and treatment of various conditions (Yang et al., 2014).

3.2. Otherness in the clinical encounter

In the area of culture and mental health, theory and practice have evolved in different directions due to factors such as population diversity, dominant notions of citizenship, the political status of cultural minorities, local traditions, and accepted psychological theories. The shift to multiculturalism can be challenging for societies not previously built on immigration, which now need to provide mental healthcare support adapted to the needs and cultural backgrounds of non-native groups. For instance, post-World War II, Sweden, once relatively homogeneous, now comprises about 15% first- or second-generation immigrants, one-third of whom are non-European (Nielsen and Hennerdal, 2017). Since the mid-1970s, newcomers to Sweden have been almost exclusively refugees, leading Swedish efforts in cultural psychopathology to focus on research and services dedicated to the aftermath of trauma. Dominant social group norms are often seen not as cultural but as the "right way" or hegemonic common sense. Using the rhetoric of common sense to obscure the value-laden cultural basis of the dominant group's practices is compounded in the medical world by the practice of "evidence-based medicine" (EBM). EBM relies on scientific evidence for patient treatment, aiming to improve patient outcomes by using the best available evidence, such as research studies and clinical trials, to make informed decisions about treatment. In mental health, EBM plays a significant role in shaping treatment options and clinical decision-making. It determines which treatments have been shown to be effective and safe, guiding the development of clinical guidelines and best practices. However, EBM approaches in mental health can exacerbate cultural domination by privileging certain perspectives and ways of understanding mental health and illness (Gone, 2015). Most mental health research has been conducted on Western populations, using Western diagnostic categories and treatment approaches. As a result, the evidence base for mental health may not represent the experiences and needs of individuals from other cultural backgrounds. While EBM has the potential to improve patient outcomes in mental health, it can also perpetuate cultural domination by favoring certain perspectives and understandings of mental health and illness. It is important for mental health professionals to be aware of these limitations and to consider cultural diversity when developing and implementing mental health treatments and interventions (Gone, 2015).

Pleas for common sense and technocratic rationality participate in the myth that public space is culturally (and religiously) neutral. Mental healthcare services typically address cultural diversity by integrating patients into standard practices, often ignoring cultural specificity. When culture is involved in mental healthcare, it is frequently invoked to explain communication failures, non-compliance with treatment, and mutual misunderstandings between clinician and patient. In such cases, culture is seen as a burden or barrier to seamless communication and cooperation, belonging solely to the patient. Conversely, the notion of culture can be used to recognize the characteristics of ethnic groups and their needs, values, and predicaments. Information about culture has been introduced into the healthcare system in the form of patterns that summarize the expression of illness in certain ethnic groups. However, this can lead to the formation of stereotypes (Andrade, 2020). These assumptions often do not reflect the range of cultural variation within a given group, nor the fact that cultural practices are linked to personal and family histories in complex and particular ways. Cultural difference also involves the personal and professional history of the physician and cultural representations of medical practice in the field of mental health.

A more useful approach to analyzing cultural differences in mental health involves examining power relations, social position, and the clash of the clinician's and patient's worldviews, rather than relying on stereotypical cultural portrayals of patients. This approach entails paying attention to the ideologies and institutions of the dominant society, as well as the context and

experiences of minority groups or individuals. As medicine is also a cultural institution, understanding its cultural assumptions can facilitate productive dialogue. To promote mental health and social justice in digital health, a systemic approach with targeted prevention and policies is necessary. Integrating Rosa's axes (2019) into mental health care can help bridge the gap between traditional and modern practices, promoting a holistic understanding of mental health that addresses both the individual and their cultural environment. Long, McDermott, and Meadows (2018), for instance, propose an epistemological debate to rectify problematic trends and promote methodological pluralism. A global and multidisciplinary approach to clinical situations should be guided by principles involving inter-institutional partnerships that reflect the cross-disciplinary nature of psychological competencies.

III. Aggregating the potentials of technology for mental e-health

Improving multicultural psychological care can harness resources such as bilingual clinicians and cultural brokers (Hall, Yip, and Zárate, 2016). However, the digital transition in mental health faces several challenges, including neoliberal and neocolonial economic structures, biased technologies, and the marginalization of alternative therapeutic methods.

Rosa's framework (2019) underscores the importance of meaningful connections across all axes of resonance, urging us to create digital mental health tools that not only address clinical needs but also enhance individuals' connections with themselves, their communities, and their environment. Efforts like the WHO's e-health strategy (2020) attempt to address these challenges, but the absence of a unified global digital health framework can lead to scattered resources. There is an opportunity for public authorities to establish a framework of values and guidelines for digital ethics that reflect user experiences and regional nuances, influencing all e-health endeavors. The creators of the Internet envisioned a shared platform (Sawhney, Verona, and Prandelli, 2005), distinct from the prevalent Western liberal digital model. Mental health care, intrinsically human-centric (Keller and Kittay, 2017), needs to embody ethical values, adapting to regional nuances and professional specifics.

To ensure trust among both users and healthcare professionals, an ethical framework for mental e-health is essential. The four pillars of ethics - autonomy, beneficence, non-maleficence, and justice - should address the ethics of data, algorithms, practices, and decision-making. Compliance with GDPR alone may not guarantee ethical compliance, particularly in terms of algorithms, justice, or equitable e-health practices. Therefore, ethical reflection on digital health should begin at the design and development level through the "ethics by design" principle, which promotes participatory design, transparency of systems, and accountability of stakeholders.

Ethics committees should be mandatory in digital health strategy, both nationally and internationally (Nebeker, Torous, and Ellis, 2019). Unlike academic institutions, technology giants are not required to ethically evaluate their products. Such committees could define and implement a reference framework for ethics in mental e-health, remaining consistent with existing international efforts. This ethical and political aim underpins emerging collaborative practices, such as creating an "information commons" or "knowledge commons" (Hess and Ostrom, 2007), promoting accessibility and cooperation.

Participatory science practices invite ordinary citizens to contribute to knowledge production, guided by scientific expertise (Jallad et al., 2021). By engaging in participatory practices and forming epistemic communities, citizens can reclaim access to collective knowledge production

processes, contributing to cognitive democracy. This approach creates new opportunities for action, expanding the practitioner's toolkit and bringing diversity into an otherwise uniform e-medical system by recognizing the needs and vulnerabilities of others as a moral imperative. It involves establishing empathetic connections, challenging institutions to acknowledge the voice and organization of others, and creating multiple avenues for knowledge and coexistence, fostering empathy and mutual respect.

IV. Concluding remarks

Geographic and financial inaccessibility and difficulties in doctor-patient communication constitute barriers that need to be overcome. By offering a technical solution considered neutral and universal, many m-health devices end up reinforcing health inequality by denying the complex structure of social relationships (Lock and Nguyen, 2018). The biases discussed in this manuscript include the tendency to look at help and treatment-seeking from only one angle (traditional or biomedical), rather than drawing on many sources within non-Western complex and layered cultural landscapes. This approach often disregards the relevance of religion and spirituality as sources of comfort, strength, and resilience, and tends to stigmatize rather than appreciate the uniqueness of each individual's narrative. The politics of otherness shape our social world, and medicine and mental health are crucial fields where cultural identity can be bridged by striving to understand and help others, recognizing our common humanity and cultural distinctiveness. Cultural practices weave people together with a common purpose, creating institutions that exceed the possibilities of a single person. Beyond culture as a primary need, cultural diversity is a social good (Mintchev and Moore, 2018). Each cultural tradition offers innovative possibilities for addressing injustices and inequalities. However, the process of neo-colonization persists in scientific relations, with developing countries often serving as reservoirs of new scientific knowledge filtered through a colonial lens without incorporating local endogenous knowledge equitably.

Fanon's insights (1952) remain profoundly relevant, reminding us that imposing a uniform health paradigm is a contemporary echo of past dominations, ignoring human diversity's rich tapestry. Embracing this diversity means acknowledging and incorporating the multiplicity of cultural experiences and knowledge systems into mental health care. It is not enough to recognize diversity; we must actively integrate it into the very ontology of our tools and platforms. Rosa's framework (2019) can help ensure that our digital futures are as diverse and vibrant as the cultures they aim to serve. We advocate for a mental e-health paradigm that is culturally informed, ethically conscious, and designed to dismantle rather than replicate systemic biases. As we move forward, let us be guided by a commitment to inclusivity that respects and cherishes the plurality of human experiences, ensuring that our digital futures are as diverse and vibrant as the cultures they aim to serve.

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References

- Ajana, B. (2017). Digital health and the biopolitics of the Quantified Self. *Health Sociology Review*, 26(1), 1-14. <https://doi.org/10.1177/20552076166895>
- Alekseev, A., Evdokimov, S., Tarasova, A., Khachatryan, K., & Khachatryan, A. (2018). Financial strategy of development of Industry 4.0 in the countries with developing economy. *Revista Espacios*, 39. Retrieved January 14, 2024, from <https://w.revistaespacios.com/a18v39n12/a18v39n12p01.pdf>
- Andrade, G. (2020). Medical conspiracy theories: Cognitive science and implications for ethics. *Medicine, Health Care and Philosophy*, 23(3), 505-518. <https://doi.org/10.1007/s11019-020-09951-6>
- Anonymous. (2018). [Title of the article]. *Integrative Psychological and Behavioral Science*, [Volume number]([Issue number]), [Page range].
- Anonymous. (2019). [Title of the article]. *Journal of Social Issues*, [Volume number]([Issue number]), [Page range].
- Anonymous. (2021). [Title of the article]. *Science and Engineering Ethics*, [Volume number]([Issue number]), [Page range].
- ap Iorwerth, G. (1985). Humanistic Psychology and the Judeo-Christian Heritage. *Journal of Humanistic Psychology*, 25(2), 13-34. <https://doi.org/10.1177/0022167885252003>
- Avellan, T., Sharma, S., & Turunen, M. (2020, January). AI for all: Defining the what, why, and how of inclusive AI. In *Proceedings of the 23rd International Conference on Academic Mindtrek* (pp. 142-144). <https://dl.acm.org/doi/10.1145/3377290.3377317>
- Bacigalupe, G., & Askari, S. F. (2013). E-Health innovations, collaboration, and healthcare disparities: Developing criteria for culturally competent evaluation. *Families, Systems, & Health*, 31(3), 248-263. <https://doi.org/10.1037/a0033386>
- Battaglia, P. W., Hamrick, J. B., Bapst, V., Sanchez-Gonzalez, A., Zambaldi, V., Malinowski, M., Tacchetti, A., Raposo, D., Santoro, A., Faulkner, R., & Gulcehre, C. (2018). Relational inductive biases, deep learning, and graph networks. *arXiv preprint arXiv:1806.01261*.
- Beattie, P. (2019). The road to psychopathology: Neoliberalism and the human mind. *Journal of Social Issues*, 75(1), 89-112. <https://doi.org/10.1111/josi.12304>
- Bhatia, S. (2002). Orientalism in Euro-American and Indian psychology: Historical representations of "natives" in colonial and postcolonial contexts. *History of Psychology*, 5(4), 376-398. <https://doi.org/10.1037/1093-4510.5.4.376>
- Bilić, P., Prug, T., & Žitko, M. (2021). *The Political Economy of Digital Monopolies: Contradictions and Alternatives to Data Commodification*. Policy Press.
- Billig, M. (1996). *Arguing and Thinking: A Rhetorical Approach to Social Psychology*. Cambridge University Press.
- Bueter, A. (2019). Epistemic Injustice and Psychiatric Classification. *Philosophy of Science*, 86(5), 1064-1074. <https://doi.org/10.1086/705443>
- Carlo, A. D., Ghomi, R. H., Renn, B. N., & Areán, P. A. (2019). By the numbers: Ratings and utilization of behavioral health mobile applications. *NPJ Digital Medicine*, 2, 54. <https://doi.org/10.1038/s41746-019-0129-6>
- Chibber, V. (2014). *Postcolonial Theory and the Specter of Capital*. Verso Books.
- Cinnamon, J., & Ronquillo, C. (2018). mHealth geographies: Mobile technologies and health in the Global South. In *Routledge Handbook of Health Geography* (pp. 279-287). Routledge.
- Cohen, A. S., Schwartz, E., Le, T. P., Cowan, T., Kirkpatrick, B., Raugh, I. M., & Strauss, G. P. (2021). Digital phenotyping of negative symptoms: The relationship to clinician ratings. *Schizophrenia Bulletin*, 47(1), 44-53. <https://doi.org/10.1093/schbul/sbaa065>
- Cohen, S. (2003). *The Punitive City*. In *Crime: Critical Concepts in Sociology*, 3, 300.
- Cohle, Z. (2019). Global Innovative R&D Offshoring with Heterogeneous Labor: The Role of IPR-Protection on Technology Transfer and the Brain Drain Effect. *Southern Economic Journal*, 86(2), 691-725. <https://doi.org/10.1002/soej.12397>
- Conrad, P. (2007). *The Medicalization of Society: On the Transformation of Human Conditions into Treatable Disorders*. Johns Hopkins University Press.
- Conrad, P., & Leiter, V. (2004). Medicalization, markets, and consumers. *Journal of Health and Social Behavior*, 45, 158-176. Retrieved January 13, 2024, from <http://www.jstor.org/stable/3653830>
- Cooper, B., & Voegelin, E. (1999). *Eric Voegelin and the Foundations of Modern Political Science*. University of Missouri Press.

- Drahos, P., & Braithwaite, J. (2017). *Information Feudalism: Who Owns the Knowledge Economy?*. Routledge.
- Drucker, P. F. (1993). The Rise of the Knowledge Society. *The Wilson Quarterly*, 17(2), 52-71. Retrieved January 14, 2024, from <https://www.jstor.org/stable/40258682>.
- Duan, C. (2020). Of Monopolies and Monocultures: The Intersection of Patents and National Security. *Santa Clara High Tech. L.J.*, 36, 369. Available at: <https://digitalcommons.law.scu.edu/chtlj/vol36/iss4/5>.
- Dutt, A. K. (2017). Globalisation, South-North Migration, and Uneven Development. In *Economics of Globalisation* (pp. 133-148). Routledge.
- Egger, M., Ley, M., & Hanke, S. (2019). Emotion Recognition from Physiological Signal Analysis: A Review. *Electronic Notes in Theoretical Computer Science*, 343, 35-55. <https://doi.org/10.1016/j.entcs.2019.04.009>
- Fanon, F. (1952). *Black skin, white masks*. Éditions du Seuil.
- Fanon, F. (1961). *The Wretched of the Earth*. Éditions Maspéro.
- Fanon, F. (1994). *A Dying Colonialism*. Grove/Atlantic, Inc.
- Fricker, M. (2017). Evolving concepts of epistemic injustice. In I. J. Kidd, J. Medina, & G. Pohlhaus (Eds.), *The Routledge Handbook of Epistemic Injustice* (pp. 53–60). London: Routledge.
- Geary-Teeter, Ari and Hosseini Ghomi, Reza (2020) A Proposed Framework for Addressing Social Justice Concerns in Future Digital Biomarker Research. [Preprint]. Available at: <https://arxiv.org/pdf/2008.07309.pdf>
- Gilman, S. L. (2000). The Jewish Foot. In *Feminism and the Body* (p. 355).
- Gone, J. P. (2015). Reconciling evidence-based practice and cultural competence in mental health services: Introduction to a special issue. *Transcultural Psychiatry*, 52(2), 139-149. <https://doi.org/10.1177/1363461514568239>
- Ha, U., Madani, S., & Adib, F. (2021). WiStress: Contactless stress monitoring using wireless signals. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 5(3), 1-37. <https://doi.org/10.1145/3478121>
- Hall, G. C. N., Yip, T., & Zárate, M. A. (2016). On becoming multicultural in a monocultural research world: A conceptual approach to studying ethnocultural diversity. *American Psychologist*, 71(1), 40–51. <https://doi.org/10.1037/a0039734>
- Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, 14(3), 575-599. <https://doi.org/10.2307/3178066>
- Hess, C., & Ostrom, E. (2003). Ideas, artifacts, and facilities: Information as a common-pool resource. *Law and Contemporary Problems*, 66(1), 111-146. Retrieved January 14, 2024, from <https://scholarship.law.duke.edu/lcp/vol66/iss1/5>
- Hess, C., & Ostrom, E. (2007). Introduction: An overview of the knowledge commons (pp. 3-26).
- Hickey, B. A., Chalmers, T., Newton, P., Lin, C. T., Sibbritt, D., McLachlan, C. S., ... & Lal, S. (2021). Smart devices and wearable technologies to detect and monitor mental health conditions and stress: A systematic review. *Sensors*, 21(10), 3461. PMID: 34065620 PMCID: PMC8156923 <https://doi.org/10.3390/s21103461>
- Hook, D. (2012). *A Critical Psychology of the Postcolonial: The Mind of Apartheid*. Routledge.
- Hunt, A. D., & Jaeggi, A. V. (2022). Specialised minds: Extending adaptive explanations of personality to the evolution of psychopathology. *Evolutionary Human Sciences*, 4, e26. doi:10.1017/ehs.2022.23
- Jallad, M., Mintchev, N., Pietrostefani, E., Daher, M., & Moore, H.L. (2021). Citizen social science and pathways to prosperity: Co-designing research and impact in Beirut, Lebanon. *International Journal of Social Research Methodology*, 1-14. doi:10.1080/13645579.2021.1942664
- Jiménez, C. E., Solanas, A., & Falcone, F. (2014). E-government interoperability: Linking open and smart government. *Computer*, 47(10), 22-24. Available at: <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6926731>
- Jona-Lasinio, C., & Meliciani, V. (2018). Productivity growth and international competitiveness: Does intangible capital matter? *Intereconomics*, 53(2), 58-62. DOI: 10.1080/09687599.2015.1067187
- Kabir, M. N. (2019). Knowledge Society. In *Knowledge-Based Social Entrepreneurship* (pp. 59-89). Palgrave Macmillan. https://doi.org/10.1057/978-1-137-34809-8_3
- Karkazis, K., & Fishman, J.R. (2017). Tracking US professional athletes: The ethics of biometric technologies. *The American Journal of Bioethics*, 17(1), 45-60. DOI: 10.1080/15265161.2016.1251633.
- Keller, J., & Kittay, E. F. (2017). Feminist ethics of care. In *The Routledge Companion to Feminist Philosophy* (pp. 540-555). Routledge.
- Kim JU, Oleribe O, Njie R, Taylor-Robinson SD. (2017). A time for new north-south relationships in global health. *Int J Gen Med*, 10, 401-408. doi: 10.2147/IJGM.S146475.

- Kulkarni, L. (2016). Health inputs, health outcomes and public health expenditure: evidence from the BRICS countries. *International Journal of Applied Economics*, 31(1), 72-84. Available at: https://web.archive.org/web/20210615164853/https://www2.southeastern.edu/orgs/ijae/index_files/IJAE%20MARCH%202016%20KULKARNI%20-%20MARCH%202016.pdf
- Levin, L., & Amram Levy, A. (2020). National Reforms in Mental Health and Social Care Services: Comparative, Text-Based Explorations of Consumer Involvement and Service Transparency. *Community Mental Health Journal*, 56(1), 42-49. <https://doi.org/10.1007/s10597-019-00499-1>
- Liddle J, Burdon M, Ireland D, Carter A, Knuepffer C, Milevskiy N, McBride S, Chenery H, Hall W. Balancing Self-Tracking and Surveillance: Legal, Ethical and Technological Issues in Using Smartphones to Monitor Communication in People with Health Conditions. *Journal of Law and Medicine*. 2016;24(2):387-97. PMID: 30137711.
- Lloyd, K. (2018). Bias Amplification in Artificial Intelligence Systems. *arXiv preprint arXiv:1809.07842*. [cs.AI].
- Lock, M. M., & Nguyen, V. K. (2018). *An Anthropology of Biomedicine*. John Wiley & Sons.
- Long, K.M., McDermott, F., & Meadows, G.N. (2018). Being pragmatic about healthcare complexity: Our experiences applying complexity theory and pragmatism to health services research. *BMC Medicine*, 16(1), 94. <https://doi.org/10.1186/s12916-018-1087-6>
- Lupton, D. (2012). M-health and health promotion: The digital cyborg and surveillance society. *Social Theory & Health*, 10, 229-244. <https://doi.org/10.1057/sth.2012.6>
- Lupton, D. (2016). The diverse domains of quantified selves: self-tracking modes and dataveillance. *Economy and Society*, 45(1), 101-122. <https://doi.org/10.1080/03085147.2016.1143726>
- Martin, W. J. (2017). *The global information society*. Taylor & Francis.
- Martinez-Martin, N., Insel, T. R., Dagum, P., Greely, H. T., & Cho, M. K. (2018). Data mining for health: staking out the ethical territory of digital phenotyping. *NPJ Digit Med*, 1, 68. doi: 10.1038/s41746-018-0075-8
- Mauco, K. L., Scott, R. E., & Mars, M. (2020). Validation of an e-health readiness assessment framework for developing countries. *BMC Health Services Research*, 20, 575. doi: 10.1186/s12913-020-05448-3
- Mintchev, N., & Moore, H. L. (2018). Super-diversity and the prosperous society. *European Journal of Social Theory*, 21(1), 117-134. doi: 10.1177/13684310166786
- Moore, P., & Robinson, A. (2016). The quantified self: What counts in the neoliberal workplace. *New Media & Society*, 18(11), 2774-2792. <https://doi.org/10.1177/1461444815604328>
- Mouton, M., & Burns, R. (2021). (Digital) neo-colonialism in the smart city. *Regional Studies*, 1-12. doi:10.1080/00343404.2021.1915974
- Nagla, B. K. (2010). Globalization and its impact on culture. *Quest-The Journal of UGC-ASC Nainital*, 4(1), 1-12. doi: 10.5958/j.0974-5041.4.1.001.
- Nakamura, Y. (2019). The role of maternal and child health (MCH) handbook in the era of sustainable development goals (SDGs). *Journal of Global Health Science*, 1(1). DOI: <https://doi.org/10.35500/jghs.2019.1.e24>
- Nebeker, C., Torous, J., & Ellis, R. J. B. (2019). Building the case for actionable ethics in digital health research supported by artificial intelligence. *BMC Medicine*, 17(1), 1-7. DOI: <https://doi.org/10.35500/jghs.2019.1.e24>
- Neto, E. C. (2020). Towards causality-aware predictions in static anticausal machine learning tasks: The linear structural causal model case. *arXiv preprint arXiv:2001.03998*
- Nielsen, M. M., & Hennerdal, P. (2017). Changes in the residential segregation of immigrants in Sweden from 1990 to 2012: Using a multi-scalar segregation measure that accounts for the modifiable areal unit problem. *Applied Geography*, 87, 73-84. DOI: <https://doi.org/10.1016/j.apgeog.2017.08.004>
- Nierenberg, O. (2017). The psychoanalysis that dare not speak its name. In N. Giffney & E. Watson (Eds.), *Clinical encounters in sexuality: Psychoanalytic practice and queer theory* (pp. 427-433). Punctum Books. Available from <https://library.oapen.org/bitstream/handle/20.500.12657/25460/1004635.pdf?sequence=1#page=428>
- Nisha, N., Iqbal, M., & Rifat, A. (2019). The changing paradigm of health and mobile phones: An innovation in the health care system. *Journal of Global Information Management (JGIM)*, 27(1), 19-46. DOI: 10.4018/JGIM.2019010102
- Noble, S. U., & Tynes, B. M. (Eds.). (2016). *The intersectional internet: Race, sex, class, and culture online*. Peter Lang International Academic Publishers.
- Northoff, G. (2021). Embrainment and enculturation: Culture, brain, and self. In J. Y. Chiao et al. (Eds.), *Oxford Handbook of Cultural Neuroscience and Global Mental Health* (pp.76-94). Oxford Academic. <https://doi.org/10.1093/oxfordhb/9780190057695.013.5>

- Oderanti, F. O., & Li, F. (2018). Commercialization of eHealth innovations in the market of the UK healthcare sector: A framework for a sustainable business model. *Psychology & Marketing*, 35(2), 120-137. <https://doi.org/10.1002/mar.21074>
- Origg, G., & Ciranna, S. (2017). Epistemic injustice: The case of digital environments. In I. J. Kidd, J. Medina, & G. Pohlhaus Jr. (Eds.), *The Routledge Handbook of Epistemic Injustice* (1st ed., pp. 303-312). London: Routledge.
- Pagano, U. (2019). Property, possession and knowledge. In F. Gagliardi & D. Gindis (Eds.), *Institutions and Evolution of Capitalism* (pp. 157-177). Edward Elgar Publishing. Available at SSRN: <https://ssrn.com/abstract=3786357> or <http://dx.doi.org/10.2139/ssrn.3786357>
- Parker, I. (2009). Critical psychology and revolutionary Marxism. *Theory & Psychology*, 19(1), 71-92. <https://doi.org/10.1177/0959354308101420>
- Pavitt, K. (1988). Uses and abuses of patent statistics. In *Handbook of quantitative studies of science and technology* (pp. 509-536). Elsevier. <https://doi.org/10.1016/B978-0-444-70537-2.50021-0>
- Philip, K., Irani, L., & Dourish, P. (2012). Postcolonial computing: A tactical survey. *Science, Technology, & Human Values*, 37(1), 3-29. <http://www.jstor.org/stable/41511154>
- Powell, W. W., & Snellman, K. (2004). The knowledge economy. *Annual Review of Sociology*, 30, 199-220. <https://doi.org/10.1146/annurev.soc.29.010202.100037>
- Psihogios, A. M., Stiles-Shields, C., & Neary, M. (2020). The needle in the haystack: Identifying credible mobile health apps for pediatric populations during a pandemic and beyond. *Journal of Pediatric Psychology*, 45(10), 1106-1113. <https://doi.org/10.1093/jpepsy/jsaa094>
- Ragnedda, M. (2020). New digital inequalities: Algorithms divide. In *Enhancing Digital Equity* (Chapter 4). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-49079-9_4
- Rasendran, R. (2019). Examining mental health apps potential in providing equitable access to care in the Global North and Global South: A scoping review. Retrieved from <https://yorkspace.library.yorku.ca/server/api/core/bitstreams/67205c41-4d32-4428-8cc5-d497eca6a3cd/content>
- Rayan, R. (2020). E-health opportunities for the low and middle-income countries. *Global Journal of Public Health Medicine*, 158-163. <https://doi.org/10.37557/gjphm.v2iSP1.40>
- Rosa, H. (2019). *Resonance: A sociology of our relationship to the world*. John Wiley & Sons.
- Rose, D., & Kalathil, J. (2019). Power, privilege and knowledge: The untenable promise of co-production in mental "health". *Frontiers in Sociology*, 4, Article 57. <https://doi.org/10.3389/fsoc.2019.00057>
- Sanou, B. (2017). ICT facts and figures 2016. The International Telecommunication Union (ITU). Retrieved January 14, 2024, from <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf>
- Sargent, S. (2021). AI bias in healthcare: Using ImpactPro as a case study for healthcare practitioners' duties to engage in anti-bias measures. *Canadian Journal of Bioethics/Revue canadienne de bioéthique*, 4(1), 112-116. <https://doi.org/10.7202/1077639ar>
- Sawhney, M., Verona, G., & Prandelli, E. (2005). Collaborating to create: The Internet as a platform for customer engagement in product innovation. *Journal of Interactive Marketing*, 19(4), 4-17. <https://doi.org/10.1002/dir.20046>
- Scott, R., Mars, M., & Hebert, M. (2012). How global is 'e-health' and 'knowledge translation'?. In *Technology Enabled Knowledge Translation for eHealth* (pp. 339-357). Springer, New York, NY.
- Scotto, S. C. (2020). Digital identities and epistemic injustices. *HUMANA. MENTE Journal of Philosophical Studies*, 13(37), 151-180. ISSN: 1972-1293
- Sharon, T. (2017). Self-tracking for health and the quantified self: Re-articulating autonomy, solidarity, and authenticity in an age of personalized healthcare. *Philosophy & Technology*, 30(1), 93-121. <https://doi.org/10.1007/s13347-016-0215-5>
- Sturzoiu, A. (2016). The role of human capital in the knowledge society. *Hyperion Economic Journal*, 4(3), 10-14. Retrieved January 14, 2024, from [https://hej.hyperion.ro/articles/3\(4\)_2016/HEJ%20nr3\(4\)_2016_A2Sturzoiu.pdf](https://hej.hyperion.ro/articles/3(4)_2016/HEJ%20nr3(4)_2016_A2Sturzoiu.pdf)
- Sue, D. W., & Sue, D. (2015). *Counseling the Culturally Diverse: Theory and Practice* (7th ed.). John Wiley & Sons.
- Sujatha, R., Ephzibah, E. P., & Dharinya, S. S. (2020). Smart health care development: Challenges and solutions. In *Role of Edge Analytics in Sustainable Smart City Development: Challenges and Solutions* (pp. 1-20).
- Svensson, J. (2021). *Wizards of the Web: An outsider's journey into tech culture, programming, and mathemagics*. ISBN: 978-91-88855-52-7 (print), 978-91-88855-53-4 (electronic). <https://doi.org/10.48335/9789188855534>

- Tare, S., & Garge, D. (2020). E-health technologies: The future healthcare. *Journal of Dental Research and Review*, 7(Suppl 1), S58-S61. https://doi.org/10.4103/jdrr.jdrr_54_19
- Teo, T. (2012). Psychology is still a problematic science and the public knows it. *American Psychologist*, 67(9), 807-808. <https://doi.org/10.1037/a0030084>
- The Lancet. (2017). Does mobile health matter? *The Lancet*, 390(10109), 2216. [https://doi.org/10.1016/S0140-6736\(17\)32899-4](https://doi.org/10.1016/S0140-6736(17)32899-4)
- Torous, J., & Hsin, H. (2018). Empowering the digital therapeutic relationship: Virtual clinics for digital health interventions. *NPJ Digital Medicine*, 1(1), 1-3. <https://doi.org/10.1038/s41746-018-0028-2>
- Tucker, I. (2017, May 28). 'A white mask worked better': Why algorithms are not colour blind. *The Guardian*. Retrieved September 16, 2021, from <https://www.theguardian.com/technology/2017/may/28/joy-buolamwini-when-algorithms-are-racist-facial-recognition-bias>
- Vardarlier, P., & Zafer, C. (2020). Use of artificial intelligence as business strategy in recruitment process and social perspective. In *Digital Business Strategies in Blockchain Ecosystems* (pp. 355-373). Springer, Cham. https://doi.org/10.1007/978-3-030-29739-8_17
- Vaughan, M. (1993). Madness and colonialism, colonialism as madness: Re-reading Fanon. Colonial discourse and the psychopathology of colonialism. *Paideuma*, 39, 45-55. Retrieved January 14, 2024, from <https://api.semanticscholar.org/CorpusID:146334744>
- Wagstaff, A., Flores, G., Hsu, J., Smitz, M. F., Chepynoga, K., Buisman, L. R., van Wilgenburg, K., & Eozenou, P. (2018). Progress on catastrophic health spending in 133 countries: A retrospective observational study. *The Lancet Global Health*, 6(2), e169-e179. [https://doi.org/10.1016/S2214-109X\(17\)30429-1](https://doi.org/10.1016/S2214-109X(17)30429-1)
- Walby, S. (2011). Is the knowledge society gendered? *Gender, Work & Organization*, 18(1), 1-29. <https://doi.org/10.1111/j.1468-0432.2010.00532.x>
- Waldron, I. (2010). The marginalization of African indigenous healing traditions within western medicine: Reconciling ideological tensions and contradictions along the epistemological terrain. *Women's Health Urban Life*, 9, 50-71. Retrieved January 14, 2024, from https://tspace.library.utoronto.ca/bitstream/1807/24423/1/9.1_waldron.pdf
- Wark, M. (2019). Capital is dead: Is this something worse? Verso Books.
- World Health Organization. (2020). *Global Strategy on Digital Health 2020–2025*. Retrieved January 14, 2024, from <https://www.who.int/docs/default-source/documents/g4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf>
- Xu, J., Wainio-Theberge, S., Wolff, A., Qin, P., Zhang, Y., She, X., ... & Northoff, G. (2023). Culture shapes spontaneous brain dynamics – Shared versus idiosyncratic neural features among Chinese versus Canadian subjects. *Social Neuroscience*, 18(5), 312-330. <https://doi.org/10.1080/17470919.2023.2278199>
- Yang, L. H., Chen, F. P., Sia, K. J., Lam, J., Lam, K., Ngo, H., Lee, S., Kleinman, A., & Good, B. (2014). "What matters most:" A cultural mechanism moderating structural vulnerability and moral experience of mental illness stigma. *Social Science & Medicine*, 103, 84-93. <https://doi.org/10.1016/j.socscimed.2013.09.009>
- Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. PublicAffairs.

^{i i} During his practice at the psychiatric hospital in Blida, Algeria, Fanon encountered patients who had been tortured. He minutely describes this colonial universe as torture that is fully part of the colonial dynamic that systematically denies the culture and personality of the colonized. Algerians are apprehended through the prism of a racist ideology that advocates a hierarchy of races (Keller, 2007).