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UNDERSTANDING AI

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UNDERSTANDING AI

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EDITOR'S NOTE

This edition explores the profound impact of AI on psychologists and mental health professionals. Our contributing writers explore the transformative relationship between humans and machines and reveal how AI is transforming therapeutic interventions, cognitive assessments, and mental health diagnostics. Collectively, they unravel the mysteries and potentials of Understanding AI in psychology and participate in the dialogue that shapes the future of AI in the psychological landscape.

Our contributing authors explain the foundations of artificial intelligence on human intellectual processes and brain functions and examine some of the lingering questions concerning the matter of consciousness as explored by neuroscientific advances. They also inquire into the matter of potential replacement of human therapists by AI alternatives, through examples in clinical psychology and counselling, and in specific circumstances such as loneliness. The potential for enhanced diagnostics also come into play along with a balanced inquiry into the challenges of bias in AI algorithms and strategies for mitigating bias. All in all, a riveting read awaits you.

Read on to explore.

Dr Denise Dillon

Editor-in-Chief



VICE PRESIDENT'S ADDRESS

The current practice of psychology is predominantly human-centric and rooted in complex human behaviour and motivation, such that the present state of AI is unlikely to fully decipher. Yet, to think like this reinforces a *manufactured normalcy*. The rapid growth of natural language processing, big data, and machine learning may eventually change that. To prepare ourselves for this inevitability, it is important for us to think about the future of our profession in relation to AI and its seemingly boundless potential. We can use a common principle of *futures thinking* to postulate about the future of psychologists: **the possible, probable, and preferable**. The future of an organisational psychologist is inextricably tied to the future of all work, making it an ideal thought exercise for a start.

Possible Futures

1. **Psychoeducation and coaching will be fully automated and asynchronous.** Mobile health (mHealth) apps designed for smartphones are increasingly popular alternatives for promoting physical and mental wellness (e.g., sleep, mindfulness). If work wellbeing is embedded successfully into such an app and delivered asynchronously without an actual psychologist, employees may no longer require direct psychological services (e.g., EAPs, executive coaching). With the advent of AI, rules-based decision-making algorithms can only become more sophisticated and nuanced to provide psychoeducation in a way that mimics human psychologists' recommendations.

2. **The entire workforce will be AI.** If AI would replace the majority, if not all, of work, then the term "organisational psychologist" may become a misnomer. Is there even a psyche to study in an AI? The future "organisational psychologist" would more likely be the programmers who can diagnose and troubleshoot an AI's work-related problems instead.

Probable Futures

3. ***AI and automation will complement the psychologist's work.*** The use of big data analytics and machine learning can strengthen the psychologist's position as a scientist-practitioner. Organisational psychologists can utilise real-time data from the workplace to conduct naturalistic research that may be more useful as compared to experimental methods that are less generalisable to the workplace. Further, AI may be incorporated into personality and performance assessments to generate highly-individualised feedback reports instantaneously. This reduces the workload of psychologists to manually analyse item-level data and write the report, which may be prone to human error.

Preferable Futures

4. ***Organisational psychologists will be the thought leaders in the future of work and in the core business of futureproofing employees.*** The core business of organisational psychologists is to improve employee wellbeing and performance. In the current VUCA conditions, the certainty that comes with futureproofing employees is that they remain productive *in spite of* the advancement in AI. As such, a preferable future would ideally be for organisational psychologists to take a more active role to be at the frontier of change in the job landscape while also futureproofing employees using their knowledge of job redesign and organisational development. For example, they may co-create viable futures for organisations and their employees during strategic planning and executive coaching. Their research should focus on developing validated assessments and interventions to ascertain and improve how future-ready the employees are.

Of course, these examples are non-exhaustive and merely serve as a starting point for deeper reflection. There are endless future scenarios that may materialise together with AI (e.g., advances in neuroscience). Equipping ourselves with some knowledge of our future allows us to **backcast** and prepare in the present day. As we try to understand AI in relation to psychology, try out this exercise with your own profession and/or sub-discipline!

Read on and get psyched!



Mok Kai Chuen
Vice President (Outreach)

Consciousness & Artificial Intelligence

By Dr Liliana Ferreira da Costa & Prof Ricardo Costa Marques

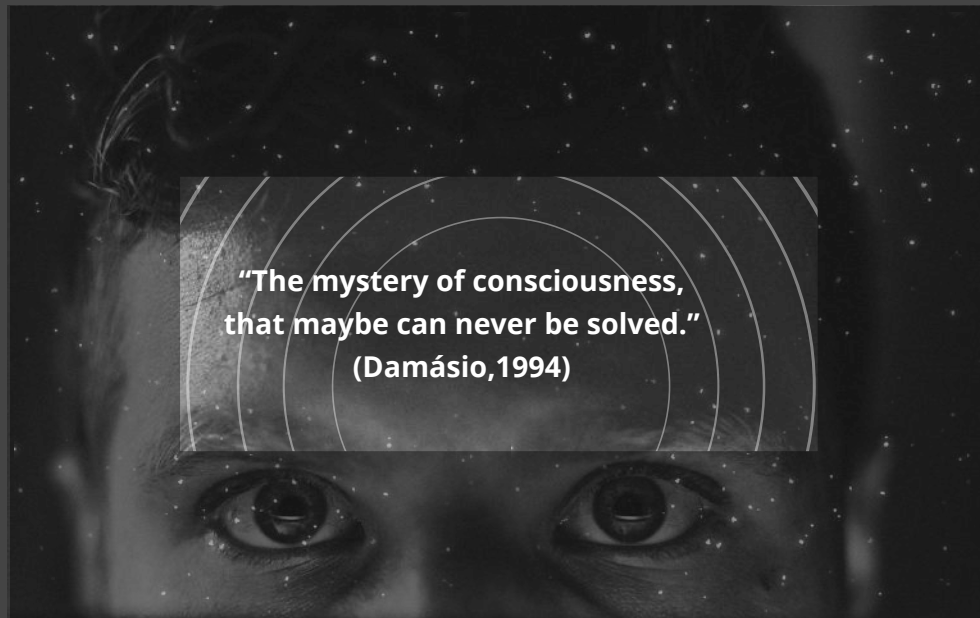
*"A major difficulty for the engineers and designers of artificial intelligence (AI) systems has been to replicate consciousness"
(Carmo, 2017).*

As previously written and similar to the study of human brain—neuroscience—AI addresses computer science which works with the simulation of human intelligence in order to interact with machines to become capable of solving problems and making decisions (Zeigler et al., 2009). According to Hassabis and colleagues (2017), consciousness presupposes life, representing a state that can only be attributed to living systems. Hassabis et al. also attribute similarities between states of consciousness in organic systems and states of artificial intelligence (e.g., computers; robots). However, these similarities do not replace the consciousness of a living system, giving space to the unknown and mysterious nature of consciousness (Damásio, 2011). While researchers no longer rely on introspection to examine the conscious self, methodological issues in consciousness research remain vexing (Simione, et al., 2023).

"At some point in the future, cognitive neuroscience will be able to describe the algorithms that drive structural neural elements into the physiological activity that results in perception, cognition, and perhaps even consciousness" (Gazzaniga, 1988).

The quote of Gazzaniga can be quite interesting or, on the other hand, can be easily misinterpreted. The development of AI addresses not only new types of algorithms, but is also useful concerning the validation of AI techniques: "... deep neural networks and deep reinforcement learning allow neuroscientists to know how impulses from the brain are communicated to other parts of the body, which helps in the early detection of movement-related disorders like paralysis (...) and to predict different neurological disorders" (Fellous et al., 2019).

According to Carmo (2017), “the nature of consciousness in the biological world and the conditions that must be fulfilled before consciousness can be attributed to some organism” must be taken into account when considering how we can observe and understand consciousness and AI. Hence, consciousness is more than cerebral images or algorithms—it represents a panoply of subjects, experiences, and senses that are centered in the living organism (Damásio, 2011). It is also important to emphasise that consciousness can be considered a “hard problem” in scientific research, when considering the field of human sciences, such as psychology, psychiatry, and neuroscience, each of which deals with cognitive, behavioral, and emotional processes (Damásio, 1994). Damásio elaborates the mystery around the study of consciousness—which remains an unsolved research problem—with several types of theories, but admits to the persistent enigma:



AI Evolution & Ethical Issues

The proof of AI evolution is inevitable when we consider the facility to comprehend and control some aspects of life; for example, the influence of AI in neuroscience can be shown as it can determine if someone has genes for Alzheimer’s disease and thereby predict the disease with extremely high accuracy (Carmo, 2017).

The consideration of the revolution that AI brings to the world, when used in an adaptive way, is extraordinary to every field of research, including psychology. However, it is important to highlight the balance as a key to protect and maintain a natural and sustainable growth.

In this sense, just as every psychologist is under an ethical obligation and code for best practices, AI researchers and systems must also be under an appropriate control and obligation with respect to the safety of data and information (González, 2023). The idealistic approach to data protection and privacy in general should not be used in the same manner, but must be an effective and reliable method to protect data, information, and people, and to prevent misuse of data.

In conclusion, it is important to highlight: “The EU’s approach to artificial intelligence centers on excellence and trust, aiming to boost research and industrial capacity while ensuring safety and fundamental rights” (European Parliament, 2024). In this sense, the Commission and Member States will achieve the main following goals: (i) enabling the development and uptake of AI in the EU; (ii) becoming the place where AI thrives from the lab to the market; (iii) ensuring that AI works for people and is a force for good in society; (iv) building strategic leadership in high-impact sectors. Following these steps, the European Parliament and its Commission and Member States addresses an approach which leads to trust and legitimate AI, as well as to approach a legal framework to AI, taking into consideration three main achievements: (i) European legal framework for AI that upholds fundamental rights and addresses safety risks specific to the AI systems; (ii) Civil liability framework - adapting liability rules to the digital age and AI; (iii) Revision of sectoral safety legislation (e.g., Machinery Regulation, General Product Safety Directive). Following a background of careful consultation and deliberations, the European Parliament passed an act to regulate AI, considering all the previous information and the safety of values and rights of the European Union.



Singapore, as well, has its own directives, such as the National AI Strategy (NAIS 2.0) that aims to achieve the following goals: (i) Excellence, addressing the challenges of selecting peaks in AI, in order to make advances and maximize value creation; (ii) Empowerment, which raise up individuals, businesses, and communities, in order to use AI with confidence, discernment, and trust—making AI a reliable field to work with, taking into consideration the balance between safety, security, efficiency and effectiveness, embracing a sustainable environment and protecting the human rights. The precious goals are in accordance with the 11 governance principles concerning transparency, robustness, fairness, data governance, inclusive growth, and societal and environmental well-being.

Artificial Intelligence & Neuroscience: Convergence Between Two Worlds

By Dr Liliana Ferreira da Costa & Prof Ricardo Costa Marques

What can we expect about Artificial Intelligence (AI) and Neuroscience, two different and yet convergent fields? These two fields help each other in their advancements and achievements.

AI & Neuroscience

According to Malik and Solanki (2021), AI addresses computer science, a field that deals with the simulation of human intelligence, which interacts with machines in order for these machines to become capable of solving problems and making decisions (Zeigler et al., 2009), similar to functions performed by the human brain. Neuroscience is the scientific field which addresses the study of the structure and cognitive functions of the brain (Samanci et al., 2022). AI and neuroscience are mutually interrelated, and neuroscience has brought many distinct improvisations into the AI field (Kaur, 2021; Malik & Solanki, 2021; Zeigler et al., 2009). Reinforcement learning in humans has inspired computer scientists to develop algorithms for reinforcement learning in artificial systems, which enables those systems to learn complex strategies without explicit instruction. Such learning helps in building complex applications (e.g., robot-based surgery, gaming applications) (Zeigler et al., 2009).

AI-based systems are trained with large amounts of data in order to learn how to perform a task. These same systems tend to use the learned knowledge to analyze the unknown inputs, thus producing the desired outcome. The unique potential of this field is that it can analyze large amounts of data without human intervention (Malik & Solanki, 2021).

All of this being so, AI fits as a choice for analyzing neuroscience data which can be complex; addressing the extraction of hidden patterns, such as are found in AI models of working memory, AI visual processing, AI analysis of larger neuroscience datasets, and computational psychiatry.

Mental and Physiological Disorders in AI & Neuroscience

Neuroscientists' research interests also lie in the study of the nervous system to get a comprehensive understanding of different neurological, psychiatric, and neurodevelopmental disorders (Kaur, 2021). In this sense, neuroscience helps in the early detection and diagnosis of mental disorders. In the same way, AI can be applied to the prediction and detection of mental disorders (Kaur, 2021; Surianarayanan et al., 2023). Close examination of biological neural networks and artificial modeling of these has led to the development of complex deep neural network architectures that are used to develop versatile applications (e.g., text processing, speech recognition). Furthermore, neuroscience helps to validate the existence of AI-based models (Samanci et al., 2022; Zeigler et al., 2009). Large-scale, AI-based simulations can also help neuroscientists test their hypotheses. Through an interface with the brain, an AI-based system can extract the brain signals and commands that are generated according to the signals (Zeigler, 2009). These commands are then fed into devices, which helps in the movement of paralyzed muscles or other human parts.

Impact of AI & Neuroscience in Psychology

With the increasing influence of artificial intelligence in the medical context, addressing the role of health care professionals such as clinical psychologists or neuropsychologists has become increasingly important for both practitioners and researchers. The revolution of hardware technologies saw a shift from traditional machine learning to deep learning in AI, conducting to the highest standards of performance in applications, such as expert systems, computer vision, natural language processing (NLP), speech recognition, and image classification (Rana et al., 2018). AI enables machines to solve complex problems and make decisions, both intelligently and intuitively, in order to help health care professionals conduct the best possible diagnostics and treatment for patients (Berggren et al., 2020; González, 2023).

It is important to embrace the evolution of technology and balance its effects with the environment, not forgetting to balance the natural use of AI and human decision-making processes. This is to ensure that the human mind still decides what to do with the information that comes from the brain when we have a mental/physical illness, or simply a new idea.

Neuro-Wellness: Pathways to Client Flourishing

By Dr. Sunita Rai

How could therapy be transformative if we accessed real-time brain data to gauge its impact on our clients?

The Transformative Potential of Real-Time Brain Data in Therapy

Imagine the transformative potential of observing the impact of therapy on our clients in real time. This vision is made possible through neurofeedback, a cutting-edge biofeedback method that employs electroencephalogram (EEG) technology to monitor brain activity live. In the human cortex, neurons typically manage their information processing through electrical signals, which facilitates the recording of their activity via an EEG (Kirschstein, & Köhling, 2009). This approach allows individuals to see their brainwave patterns, offering a deeper understanding and control over their mental states. Under the guidance of skilled professionals, clients can understand their brain activity, leading to significant progress in managing conditions like anxiety (Hammond, 2005), depression (Choi et al., 2010), ADHD (Lim et al., 2023), and PTSD (Reiter, Andersen, & Carlsson, 2016).

Neurofeedback is a psychophysiological technique where individuals receive immediate feedback on their brain activity, empowering them to self-regulate their neural processes ((Sitaram et al., 2017). Neurofeedback taps into the brain's remarkable ability for neuroplasticity, the process of forming and reorganizing synaptic connections in response to learning or experience. It provides immediate feedback on brain activity, enabling the restructuring of neural networks. Such adjustments can enhance brain function, including faster learning and better memory retention. Beyond therapeutic use, neurofeedback aids in improving overall cognitive and emotional well-being.

The Challenge Reimagined

Frequently, my clients express appreciation for the progress made in therapy, yet they also convey a longing for deeper insights into the changes occurring within their brains. A common sentiment emerges: a desire for accelerated transformation. They often voice a wish for a tangible, empowering tool that could complement their therapeutic journey, offering daily support and hastening the path to well-being.



Neurofeedback Devices: A Revolutionary Complement to Therapy

To bridge this gap, neurofeedback technology has become a groundbreaking adjunct to traditional therapy. It's not just a tool for observation but a means of active transformation. By leveraging neuroplasticity, neurofeedback provides a real-time, interactive look into the brain's workings, empowering clients to take an active role in their healing process.

In my practice, I use a portable EEG device that captures and analyses brainwave patterns non-invasively. This device, integrated with a neuro-operating system powered by artificial intelligence, interprets various mental states such as attention, relaxation, and stress. This technology offers precise insights into the client's mental state, enhancing our understanding and approach to therapy. In summary, EEG signals have the capability to:

- Evaluate: Determine the condition of brain health.
- Monitor: Observe the brain's mental states while active.
- Control: Manage signals responsible for motor functions, choices, etc.

We monitor a wide range of brain activities (with the client's permission), providing clients with detailed reports on their brain's electrical activity across different states. This comprehensive analysis helps tailor therapy to each client's unique needs, enhancing the therapeutic experience's personalization and efficacy. By combining technology with traditional therapy, we're pioneering a more effective, client-centred approach to mental health.

Empowering Clients Through Technology and Tailored Therapy

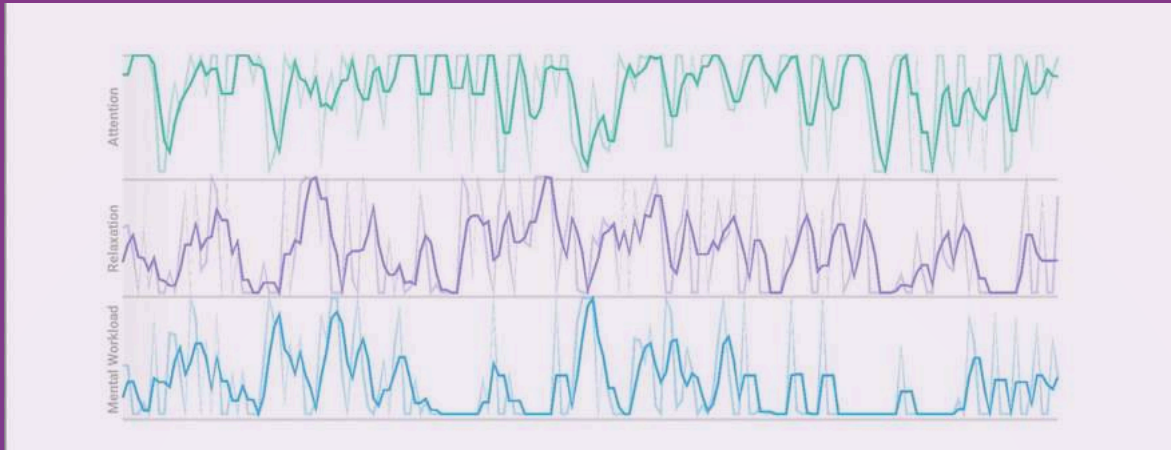
This method facilitates a detailed understanding of each client's brain, allowing for customized therapy adjustments with unparalleled precision. The outcome is a therapy experience that not only accelerates progress but also deepens the client's engagement with their mental health journey. Through the integration of technology and traditional therapeutic techniques, we're establishing new benchmarks for treatment effectiveness, paving scientifically advanced yet profoundly human-centric pathways to well-being.



Case Example

A client's assessment result from one of the applications using the EEG device and the neuro-operating system for the following:

A) Mental State: Brain waves during an Awareness of Breath mindfulness practice for 8 minutes



Source: MindViewer App

This graph measures the different aspects of mental state over time:

1. **Attention:** This graph shows a relatively stable pattern with frequent fluctuations around a central level, suggesting that client's attention is fluctuating regularly but staying within a certain range. There are no prolonged peaks or troughs, which would suggest sustained periods of high attention or distraction, respectively. Instead, the attention level appears to oscillate, which could be indicative of the person responding to varying demands for attention or periodically shifting focus.
2. **Relaxation:** The relaxation graph displays a pattern of more pronounced peaks and valleys than the attention graph. The peaks suggest moments when the individual is more relaxed, while the valleys indicate less relaxation. The variation is more spread out compared to the attention graph, which could mean that the individual's relaxation levels are changing less frequently but with greater intensity. This might be associated with the client's response to relaxation prompts or could reflect an adaptation phase to the environment or activity during the measurement period.
3. **Mental Workload:** The mental workload graph shows sharp spikes that rise quickly and then return to a baseline. These spikes could represent moments when a client is experiencing a sudden increase in cognitive demand, which then subsides. The frequency and intensity of these spikes would be important for understanding the types of tasks the individual is engaged in. Fewer, more intense spikes could indicate intermittent but intense focus on a task, while more frequent spikes could suggest a task that requires constant shifts in mental engagement.

These metrics can provide insights into a client's cognitive state and suggestions on best approaches to support her mental state.

B) Cognitive Assessment Summary Table

| Attention | Memory | Spatial Ability | Decision/Flexibility |
|-----------|--------|-----------------|----------------------|
| 80 | 100 | 80 | 40 |

Results are from an EEG device and an app.

1. **Attention:** Client scored 80 out of 100, indicating a good level of attentional capacity. This score suggests that she can maintain focus effectively, although there may be some room for improvement. Cognitive-behavioural techniques could be used to help improve focus and concentration. This might include mindfulness exercises, which have been shown to enhance attentional control.

2. **Memory:** The score is a perfect 100 out of 100, which implies an excellent memory capacity. She has a strong ability to recall information and it is her strength. The treatment plan would recognize and leverage this ability in therapeutic strategies, such as using it to recall coping strategies or to remember successful problem-solving experiences. Memory techniques could also be used to help the individual internalize and apply cognitive-behavioural strategies or insights gained in therapy.

3. **Spatial Ability:** Like Attention, client scored 80 out of 100 for Spatial Ability. This suggests a good capacity for understanding and remembering the spatial relations among objects. Training exercises designed to improve working memory could also indirectly benefit attention and spatial ability.

4. **Decision/Flexibility:** Client scored 40 out of 100, which is considerably lower than the other scores. This indicates a potential area of development for her. Her ability to make decisions efficiently and adapt to new information or changes in her environment needs improvement. We could explore whether this challenge is due to anxiety, rigid thinking patterns, or difficulties processing and integrating new information. Techniques might include cognitive flexibility training, problem-solving therapy, and exercises to increase tolerance for ambiguity and change. Role-playing scenarios and decision-making models could be introduced to help the individual practice and develop these skills in a safe environment. Approaches such as CBT, ACT, DBT together with neurofeedback solutions can be explored to support the client in her journey.

Neurofeedback is increasingly being integrated with traditional talk therapy to enhance treatment outcomes (Weiner, 2016). This combination harnesses the power of real-time EEG data to help patients gain greater self-awareness and control over their neurological processes. As they engage in talk therapy, clients can simultaneously observe and learn to modulate their brain activity. By visualizing and understanding their brain's response to thoughts and emotions during therapy sessions, clients can work towards self-regulation, potentially accelerating the therapeutic process and increasing its effectiveness. This blended approach offers a holistic path to treatment, combining the introspective and cognitive work of psychotherapy with the concrete, measurable changes facilitated by neurofeedback.

Harnessing the Potential: The Role of AI in Mental Health Diagnostics

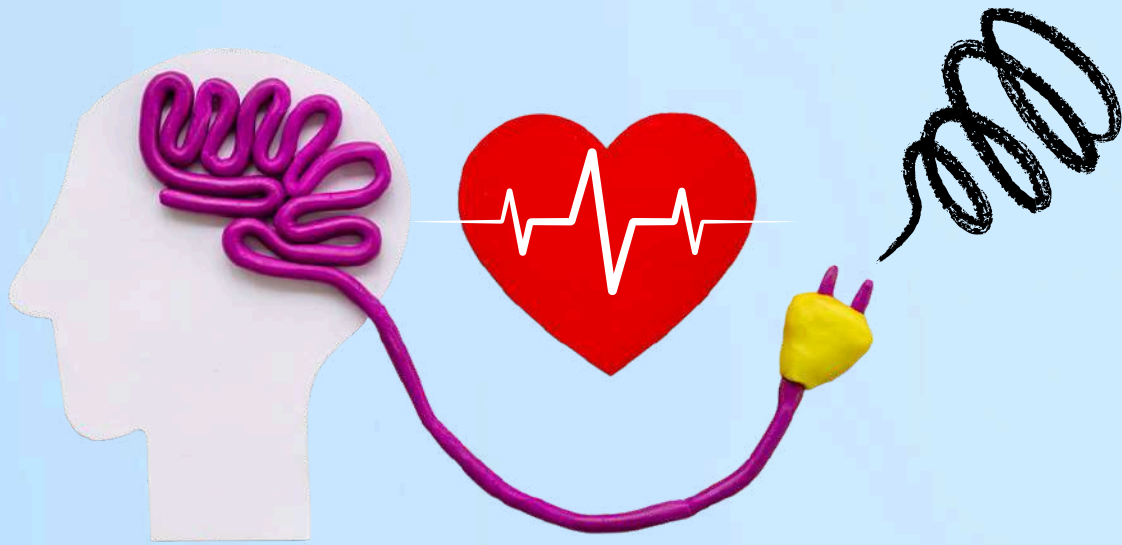
By Ms Shamini Ganasarajah

The intersection of artificial intelligence (AI) and mental health diagnostics has emerged as a promising frontier. As our understanding of mental health disorders deepens and technology continues to advance, AI offers novel solutions to enhance diagnosis, treatment, and support systems. Here we explore the evolving role of AI in mental health diagnostics, highlighting its potential benefits, challenges, and ethical considerations within the context of understanding AI.

Understanding AI in Mental Health Diagnostics

AI encompasses a range of technologies including machine learning, natural language processing, and neural networks, that enable machines to simulate human intelligence (Yan, Ruan, Jiang, 2022). In mental health diagnostics, AI algorithms analyze vast amounts of data; for example, behavioral patterns, genetic markers, and neuroimaging results; to identify potential risk factors and predict diagnostic outcomes. By processing complex datasets with speed and precision, AI has the capacity to revolutionize traditional diagnostic practices and improve patient care.





Enhancing Diagnostic Accuracy

One of the primary advantages of AI in mental health diagnostics is its ability to enhance diagnostic accuracy. Traditional diagnostic methods rely heavily on subjective assessments by clinicians, which can be prone to bias and variability. AI algorithms, on the other hand, can analyze multimodal data from diverse sources to identify subtle patterns and markers that may not be apparent to human observers. In America, a clinical researcher reviewed existing studies that used AI to predict, classify, or subgroup mental health illnesses and found that their overall accuracy ranged between 63% to 92% (Keary, 2023). This level of accuracy from AI proves to be better than human diagnosis as researchers from the 1950s until today are unable to determine exactly how accurate mental health diagnoses can be. However, the reliability of psychiatric diagnoses of this generation has improved at the level of research studies due to the use of stringent design, diagnostic criteria, and structured interviews (Aboraya, Rankin, France, El-Missiry & John, 2006). Using AI to increase diagnostic accuracy enables earlier detection of mental health disorders and more personalized treatment interventions, ultimately improving patient outcomes.

Predictive Analytics

AI-driven predictive analytics have the potential to transform mental health care by identifying individuals at risk of developing psychiatric disorders before symptoms fully manifest. By analyzing longitudinal data from electronic health records, wearable devices, and social media platforms, AI algorithms can detect early warning signs and intervene proactively to prevent escalation (Badidi, 2023). This proactive approach not only reduces the burden on healthcare systems but also empowers individuals to take control of their mental well-being through targeted interventions and support services.

Remote Monitoring and Telehealth

The integration of AI technologies with telehealth platforms facilitates remote monitoring and real-time interventions for individuals with mental health conditions (Varahade, 2023). Wearable devices equipped with biosensors and AI algorithms can track physiological parameters, sleep patterns, and behavioral indicators, providing clinicians with continuous insights into patients' well-being. Additionally, AI-powered chatbots and virtual assistants offer on-demand support, psychoeducation, and therapeutic interventions, extending the reach of mental health services to underserved populations and enhancing accessibility and affordability.

Challenges and Ethical Considerations

Despite its transformative potential, the widespread adoption of AI in mental health diagnostics presents several challenges and ethical considerations. Privacy and data security concerns arise due to the sensitive nature of mental health information and the potential for misuse or unauthorized access. Recently T-Mobile in the US revealed that an application programming interface equipped with AI capabilities could secure unauthorized access, leading to over 30 million users' confidential information being stolen. Moreover, the lack of transparency and interpretability in AI algorithms raises questions about accountability, fairness, and the potential for algorithmic bias. It is imperative to establish robust regulatory frameworks, ethical guidelines, and standards of practice to ensure the responsible and ethical deployment of AI in mental health care (Warrier, Warrier & Khandelwal, 2023).

Conclusion

The integration of AI into mental health diagnostics represents a paradigm shift in the way we understand, diagnose, and treat psychiatric disorders. By harnessing the power of AI-driven analytics, predictive modeling, and precision medicine, we can improve diagnostic accuracy, enhance treatment outcomes, and optimize resource allocation within mental health care systems. However, to fully realize the potential of AI in mental health care, we must address the associated challenges and ethical considerations, prioritizing patient privacy, autonomy, and well-being. As we continue to advance our understanding of AI and its applications in mental health, collaborative efforts between researchers, clinicians, policymakers, and technologists are essential to ensure that AI serves as a force for positive change in promoting mental health and well-being for all.

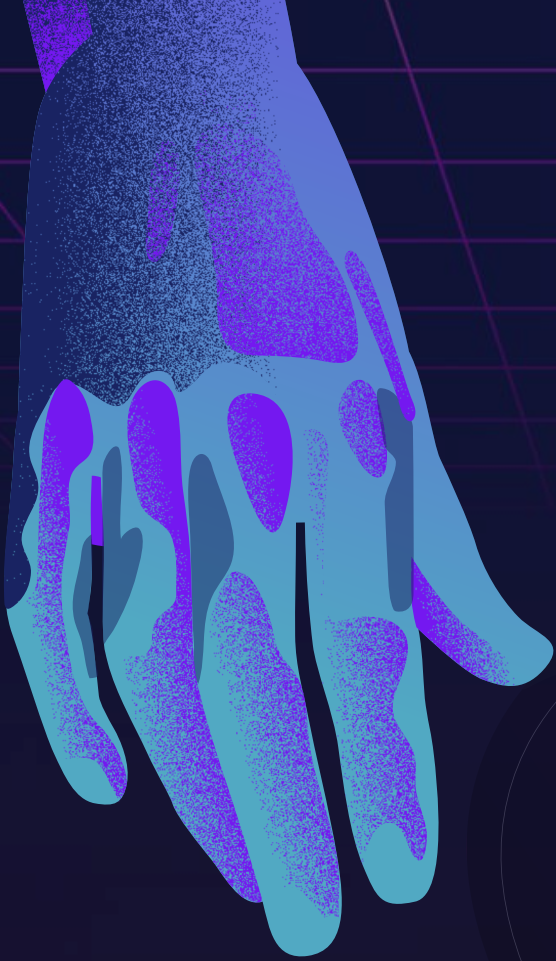




In the world of Artificial Intelligence, are therapists and clinical psychologists redundant?

Ms Eleanor Poh Mei Hui

Artificial Intelligence (AI) is a groundbreaking technology that has become no stranger to us. Simulating the intricate decision-making processes of the human brain via algorithms, it enables computers and machines to perform tasks that historically required human intelligence and problem-solving capabilities. This is done by using existing datasets to train AI to make increasingly accurate predictions or classifications over time. Its applications are everywhere—Amazon's voice assistant Alexa, large language models like OpenAI's ChatGPT, self-driving vehicles, and even our GPS-enabled devices use AI to help us navigate the complexities of everyday life. Today, AI can help us generate not just text and human language, but also other novel content, such as images and videos.



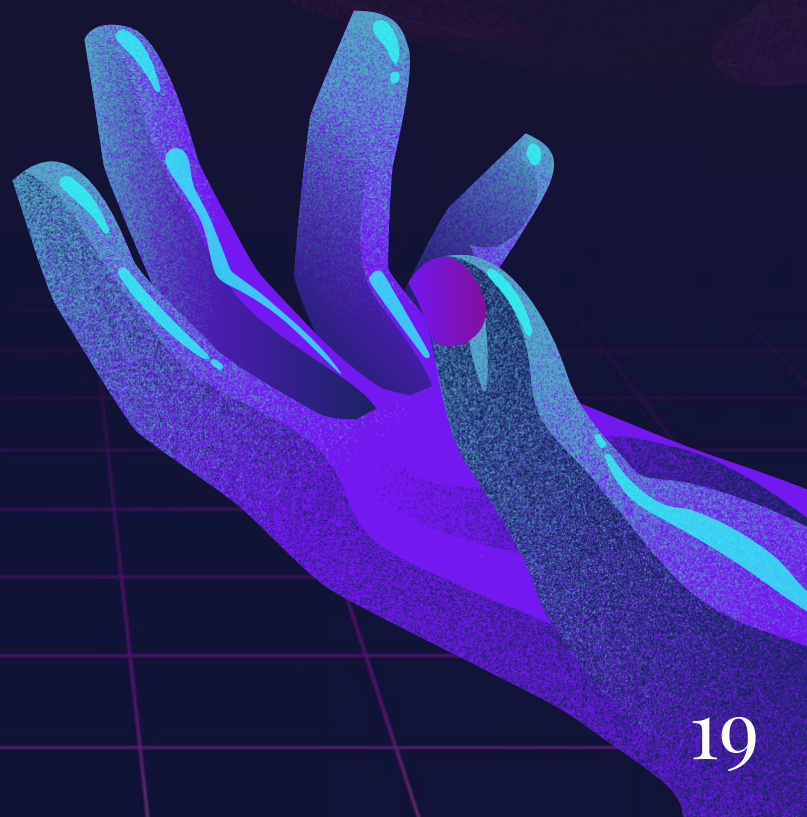
It is natural then for many workers, such as accountants and data entry clerks, to fret about AI taking over their jobs due to their ability to automate or augment human tasks. Similarly, this anxiety may be shared among therapists and clinical psychologists. Just recently, an increasing number of AI therapy chatbots such as Wysa and Tess have sprung up in our market (Fiske et al., 2019), acting as virtual therapists to alleviate distress (Li et al., 2023). Even ChatGPT has been used to provide “therapeutic advice” upon user’s input and is capable of holding its own in conversations to offer solace and a “listening ear” (Landwehr, 2023).

As bizarre as it sounds, it seems that talking to a therapy robot has become a reality. But why is there a sudden increase of AI in mental healthcare?

The rewards of using AI in mental healthcare

For one, AI can offer digital therapeutic interventions for individuals with mild to moderate symptoms at their own convenience and in the comfort of their home. This allows for more remote counseling sessions that increase access to mental health support for those facing barriers to in-person treatment (Abrams, 2023). Furthermore, this can circumvent the hefty costs and long waiting times to see a therapist at public hospitals or clinics.

AI can also provide data analysis and insights by helping us to analyze large datasets to identify useful patterns or trends related to mental health and identify effective interventions to improve treatment outcomes (Graham et al., 2019). These can potentially act as predictive tools to identify and classify at-risk patients to aid diagnoses (Tutun et al., 2023), and help psychologists intervene early to provide targeted support.



AI therapists vs. Human therapists

It is unsurprising then that AI is revolutionizing the field of mental healthcare from diagnostic accuracy to the implementation of therapeutic interventions. But will there come a point when these AI therapy bots can fully replace human therapists to provide us mental health support?

Well, it is unlikely. According to research, the therapeutic relationship is the best predictor of treatment outcome (Ardito & Rabellino, 2011). However, AI is a machine that could be unable to mimic human empathy completely to provide the genuine human connection needed to build the trust and therapeutic alliance between the client and therapist (Nosta, 2023). This is because it may struggle to replicate every complexity and nuance of human emotions and behaviours, since it lacks emotional and cognitive faculties, resulting in a phenomenon called “artificial empathy” that is more akin to a façade (Nosta, 2023). This may prevent it from effectively providing empathetic responses that encompass active listening, warmth, congruence, and unconditional positive regard, thereby underscoring the need for a human therapist.

Furthermore, AI is based on machine learning which uses predetermined training data that may include embedded human biases (Norori et al., 2021). Hence, it could potentially exacerbate existing biases even in therapy and affect those who are marginalized, widening health inequalities (Straw & Callison-Burch, 2020).

Besides, therapy aims to provide a safe space for clients to share about their personal experiences. When such confidential and sensitive data is collected through AI, there may be ethical concerns about the usage of sensitive information and issues in ensuring patient confidentiality, especially if there are data breaches from hackers. The use of AI may then potentially go against the patient’s informed consent (Abrams, 2023).

Finally, AI may also be unsuitable for helping patients with serious mental health issues, such as personality disorders. This is because they may be unable to interpret all non-verbal cues well and provide the clinical judgment or decision-making that often comes from the collaboration of various mental health professionals, such as psychiatrists, psychologists, nurses, and social workers in a multidisciplinary care team (Stephenson et al., 2023). This may consequently lead to a higher possibility of misdiagnoses and ineffective treatment plans.

Yet despite these concerns, it can be said that AI will not be going away anytime soon—instead, we would likely see the increasing prevalence of AI in clinical practice. What are some helpful suggestions, then, on how therapists and clinical psychologists may incorporate AI into their existing practices?

Well, there are many possibilities for us to explore!

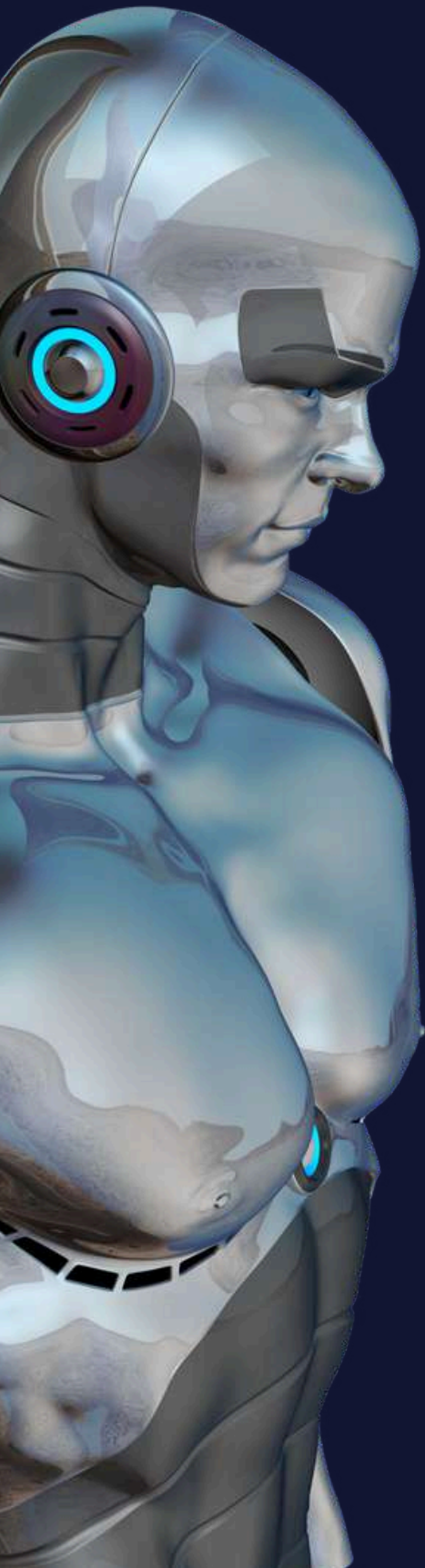
Making the best of AI in everyday clinical practices

Since AI can be used to increase efficiency and task automation, it can be used in clinical practices to automate administrative tasks and organize patient data for therapists (Abrams, 2023), since a lot of time can be spent on administrative processes for patient care. AI technology may even be used to help therapists take case notes. For example, Eleos, an AI app, can listen to sessions, record session notes, and highlight evidence-based clinical insights, themes and risk factors for practitioners to consider (Abrams, 2023; Cornish, 2023). This assistance may then free up time and effort for mental health care providers to focus on providing quality care.

Besides that, when used properly, AI may also be able to help us check in with patients and provide symptom-tracking, administer or analyze psychological assessments, as well as offer psychoeducation between sessions (Abrams, 2023). Additionally, AI chatbots may be used as an alternative or a supplement to clinical practice for patients who are uncomfortable with talking to a human therapist. This may benefit those who are new to therapy or struggling with social anxiety, making therapy more inclusive (Abrams, 2023). Novel types of therapy that leverage on AI have also been created. For instance, virtual reality therapy has been explored for clients to experience exposure therapy or manage trauma-related disorders in a safe manner (Kothgassner et al., 2019; Rice, 2022).

AI can be a double-edged sword when considering its application in our everyday and professional lives. However, just as we trust AI to brainstorm ideas, create new images or suggest new food to try out, we can also learn to trust it as a helpful aide in guiding and streamlining clinical work and processes. But would there ever be a day when all our therapists are robots or machines instead of humans?

Perhaps one day, but not so soon.



Can A.I. help us be
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The answer is not
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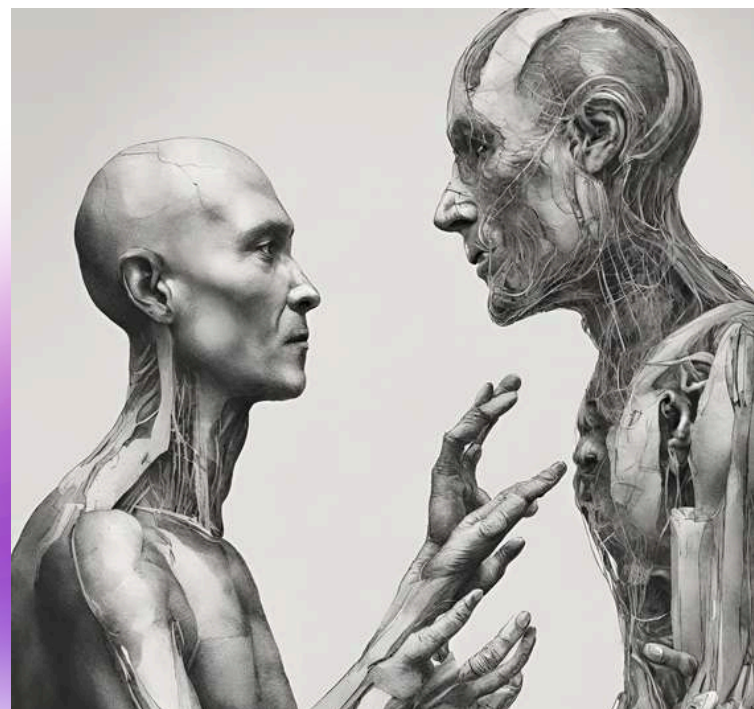
By Dr Suellen Lee, Ph.D.



While the world is more digitally connected than ever before, loneliness is so prevalent that it has been declared a “global public health concern” (WHO, 2023). At the same time, the increasingly sophisticated capability of AI to mimic human-like conversations and provide emotional mirroring offers an affordable and scalable technological solution to this global problem of loneliness by reducing barriers to access mental health tools and services.

Replika and Xiaoice, two popular AI-companion chatbots powered by generative AI technology, collectively have almost a billion active users (Maples et al., 2024). While Replika is not explicitly marketed as a therapy tool, clinical psychologists have helped design the platform to be able to screen for clinical signs of depression, suicidal ideation, and abuse among college students and then refer flagged users to appropriate outside services (Maples et al., 2024). Additionally, AI-powered therapy chatbots like Elomia have demonstrated results in reducing symptoms of depression, anxiety, and negative emotional states in their users (Romanovskyi et al., 2021). TalkLife, a global, peer-to-peer mental health support network, also harnesses the language capabilities of AI to provide empathy coaching for inexperienced peer supporters (Sharma et al., 2021). The potential of AI to tackle mental health problems on a global scale is, indeed, promising.

However, recalling the lessons of *The Social Dilemma* (Orlowski et al., 2020), a documentary which revealed how social media – a tool for increasing people’s connectedness—can negatively affect users’ mental well-being, how can we ensure that the rise of AI virtual companions will not result in similar traps? More specifically, how will AI further change our social and relational landscape, and could it stunt our ability to form and sustain deep connections (SXSW, 2023)? Thus far the technologies we have become dependent on to mediate social, human-to-human interactions include email, instant messaging, and social media platforms, but technology-mediated social interactions will increasingly include interacting with, and even developing relationships with, AI chatbots (e.g. Replika). Moreover, in the near future, more and more people may access therapeutic interventions via AI therapy chatbots, in addition to their ongoing relationship with a human therapist or, possibly, in lieu of one (e.g., crisis interventions).



As a practicing clinical psychologist, however, I am concerned about how these AI-chatbots are being marketed and how that marketing creates artificial expectations of relationships. While no company that has created an explicitly therapeutic chatbot claims that their product will replace professional therapy, companies that have created AI *companion* chatbots, which are created very similarly to therapy chatbots (because both are designed to be able to deliver human-like conversations and provide emotional mirroring), do make claims that their AI chatbots are actually better than real-life relationships. For example, the MyGirl app claims, *"your AI girlfriend even understands and answers you better than a real person."* Similarly, the app Virtual Girl claims, *"Everybody says that it's impossible to find an IDEAL GIRLFRIEND, but we disagree! Here's a perfect partner for anyone—Virtual Girl."* In other words, these are virtual companions being marketed that promise *relationships of perfection* which, as psychologists, we know is not only deceptive marketing but has serious mental health implications. Studies have already demonstrated that the rise of anxiety and perfectionism in the younger generation is due to inappropriate time on social media (Harren et al., 2021), so it is not far-fetched to fear the same can happen for users of apps like VirtualGirl or iBoy.



The marketing of virtual boyfriends and girlfriends as "perfect" seduces users to not only believe that virtual is better, but that "perfect" is ideal, and these two claims are harmful to our mental health and emotional growth. As psychologists we know, from decades of understanding of human development, that dealing with the imperfections of life and human relationships is key to emotional development and character; from our sense of self-efficacy and agency, to emotional regulation, to respecting other people's boundaries, and the capacity for delayed gratification. I fear the deceptive marketing claims of some companion chatbots will exacerbate the rise of loneliness and mental health issues that AI companions claim to address, unless they are designed to facilitate a user's real life support system (e.g., Maples et al., 2024). To borrow the words of Tristan Harris who advocates for thoughtful, wisdom-driven realignment of our relationship with technology (Harris, 2022), can we design our AI bots not to be "digital pacifiers" (Orlowski et al., 2020) but instead design them to help us develop our ability to tolerate discomfort and uncertainty, to accept and allow feelings of disappointment and loss that may be part of taking risks in relationships? Or, if a user shares about their feelings of loneliness and/or social anxiety, would the AI agent recommend real-life activities? Would they reply, "That sounds like something important to share with someone. Is there someone in your life you could share that with?"

As we move forward with seeing AI affect the social and emotional realms of life, we must ask the question of whether we are designing AI-chatbots to fundamentally help us become better humans with enhanced relationship skills. All technology is a tool, and the question about whether a tool is useful or not, helpful or not, will be based on how skilled users are in wielding that tool. A hammer in the hands of a child can cause a lot of destruction, but a hammer in the hands of a skilled carpenter can create beautiful and useful pieces of furniture. Thus, as we embrace the opportunities to use AI and tackle huge problems like loneliness and close mental health access gaps, we have to admit that we are also at an uncertain crossroad. I hope this commentary stirs critical thinking among us as psychologists in Singapore to insist that the design of AI chatbots be human-centered, to raise alarms on false marketing claims that can actually harm people's mental health, and yet intentionally advocate for AI powered apps that can help us become better at relationships and at connecting authentically with ourselves and others (e.g. Talklife's empathy coaching tool).



As a psychotherapist, I would like to share two ways I can imagine helpful clinical collaborations with AI:

- 1) Psychoeducation. The DBT Coach app (by Resiliens), for example, has hundreds of lessons that help users learn and practice key DBT concepts. The app can customize recommendations to each user and track their progress. Assigning clients to use an adjunctive therapy app like this is cost-effective for clients and which means in-person sessions can be focused on more nuanced interpersonal work.
- (2) Emergency support outside working hours. Clients with emotional regulation issues often initiate support between therapy sessions, and sometimes during non-working hours. These are the times when having access to an AI-powered virtual therapist would be appropriate and timely. Many mental health apps are already creating tools that can help clients this way.



Loving-kindness, Compassion, and Joy – Essential Psychologist Emotions that AI Chatbot is Missing

By Mr Zeb Lim

ChatGPT's ability to mimic a human's conversational tone in their response is impressive; however, it can be said that while it engages our human intellectual curiosity, it does not touch our human heart (for some of us, anyway). The work of a psychologist, those who are in the healing profession, especially Clinical, Counselling, and Educational Psychologists, are dealing with not only human intellect but also human emotions, and providing warmth, something that the AI Chatbot of the current iteration still lacks.



The work of Barbara Fredrickson and her colleagues (Fredrickson et al., 2008) on loving-kindness practice has gained great interest following the inclusion of mindfulness in psychology-based therapeutic interventions. While mindfulness is focused on the cultivation of the mind, loving-kindness, compassion, and joy are more focused on the cultivation of the heart; the human emotions. Let us explore how cultivating positive emotions benefits psychologists and our clients.

Loving-kindness – Start with a smile

Loving-kindness meditation is a practice to cultivate open, unconditional love, for self and others (Salzberg, 1995). Unconditional positive regard, a core element in person-centered therapy emphasized by humanistic psychologist Carl Rogers (1957), embodies the spirit of loving-kindness in therapy work. Regardless of what the clients bring to the session, Carl Rogers would imbue them with the same sense of acceptance and support, with the belief that seeing them as a person of worth would be conducive to the person's self-awareness, self-worth, and personality growth, which are important for their healing.



Dr Gregory House, from the medical drama, *House, M.D.* (Shore, 2004), is an unlikeable medical genius who can diagnose seemingly undiagnosable illnesses quickly and yet is known to have terrible bedside manners. Thankfully, he has a team of fellow doctors who help to soothe and soften the harsh words of Dr House. In our own lives, I am sure we have encountered kind and compassionate doctors, and we leave the doctor's office feeling better. "Words are our scalpel," Dr Tamara Mikinski (personal communication, n.d.), my Counselling Psychology lecturer reminded me in my graduate school years. We can choose to be kind in our words while upholding our professional standards.

Loving-kindness meditation practice increases the experiences of positive emotions over time, which, in turn, increases a wide range of personal resources (e.g., increased mindfulness, purpose in life, social support, decreased illness symptoms) (Fredrickson et al, 2008). As loving-kindness is a positive emotional state that can be cultivated, it is something that both psychologists and clients can practice and grow.

Compassion – Just listen attentively

Compassion is defined in the Cambridge online dictionary as “a strong feeling of sympathy and sadness for the suffering or bad luck of others and a wish to help them.” However, there are times when there is little much that we can do to help someone. In those cases, an act of compassion would be to simply be present—listening attentively to their challenges, letting them have a space and a listening ear. Bearing witness to another’s suffering is an important act of compassion. Being validated and heard by another is vital in remembering traumatic memories for survivors of trauma, sexual abuse, and incest to aid in the healing process (Bonanno, 2013). It takes emotional strength just to sit quietly and listen to someone share at length, as opposed to stepping in and wanting to help by prescribing solutions.



Brain imaging studies using functional magnetic resonance imaging (fMRI) on both experienced and novice meditators show that by practicing loving-kindness and compassion meditation, one can regulate thoughts and emotions, which may help prevent depression (Lutz et al., 2008). Expert meditators on compassion can be more empathetic yet be less emotionally dysregulated by sounds of people in distress. This is important to note as compassion fatigue is a real challenge for helping professionals, and the ability to be with someone in distress without being overwhelmed is an important practice to cultivate. Furthermore, emotion regulation is an important life skill in handling distressing life events for everyone.

Joy – Be happy for everyone’s success

In the Pixar film, *Inside Out* (Docter, 2015), we see the 5 emotions of Joy, Fear, Disgust, Anger, and Sadness, playing out inside the mind of the young protagonist, Riley. Every emotion has a role to play, at different times. In therapy, what psychologists may predominantly see is anger, fear, and sadness, with anxiety and depression commonly diagnosed. Seeing full recovery in our clients in session is minimal, compared to the pain and suffering that we encounter in our work. Hence, we psychologists need to pay attention to every little success and happiness in session. This is important not only for psychologists to remain motivated by the success of our client’s healing, but also to teach our clients to pay attention to the “small” successes and joy in their lives.

You may have heard of “schadenfreude”, the German word used to describe the pleasure you derive from another person’s misfortune. The counterpart to schadenfreude is “freudenfreude,” a term (inspired by the German word for “joy”) that describes the bliss we feel when someone else succeeds, even if it doesn’t directly involve us (Fraga, 2022). Our successes are harder to achieve in abundance across time, plus we have to contend with the effect of the hedonic treadmill, whereby we need greater amounts of success to achieve the same level of happiness. However, if we can leverage and capitalize on others’ successes as well, we find that we can tap into the ever-replenishing well of joy.

Humans are social creatures; we need to be recognized by others for our successes and challenges. While we no longer celebrate our rites of passage and celebrations in village squares, we announce our achievements by sharing them on social media where we receive Likes and Reactions online. We are seen by others when they recognize us, for our ups and downs. Hence, psychologists play an important role in acknowledging our clients’ roller coaster rides in life, through their ups and downs. This is something that cannot be replicated by an AI therapy bot.



“I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.” Maya Angelou

In conclusion, let us remember Maya Angelou’s words, that how we make someone feel is important in our social interactions with our fellow human beings. While as humans we may have limited intelligence and resourcefulness as compared to ChatGPT, we can always choose to be kind, to be present and listen attentively, and to celebrate success in our journey with our client (and people around us). Mirroring our human emotions to another human in need could be the very thing that catalyzes the healing journey for another.

Addressing Bias in AI Decision-Making

By Shamini Ganasarajah

In recent years, the integration of artificial intelligence (AI) into various facets of human life has been both revolutionary and challenging. One of the many significant challenges that has garnered considerable attention is the issue of bias in AI decision-making processes. Bias in AI algorithms can lead to unfair outcomes, reinforcing societal inequalities and perpetuating discrimination.



Understanding Bias in AI Decision-Making

Bias in AI decision-making can arise from various sources, including the data used to train algorithms, the design of the algorithms themselves, and the context in which they are deployed. Data bias occurs when the training data are skewed, leading to algorithmic biases that reflect and perpetuate existing societal prejudices (Timmons et al., 2023). For example, if historical data used to train a hiring algorithm disproportionately favour male candidates, the algorithm may inadvertently discriminate against female applicants.

Algorithmic bias refers to the inherent biases embedded in the design and implementation of AI algorithms. These biases can manifest in multiple forms, such as overgeneralization, stereotyping, and prioritization of certain features over others. For instance, facial recognition algorithms trained primarily on data from lighter-skinned individuals may exhibit higher error rates when applied to darker-skinned individuals, reflecting a form of racial bias.

Contextual bias emerges when AI systems are deployed in specific environments or social contexts that influence their decision-making processes. Factors such as organizational culture, societal norms, and power dynamics can shape the outcomes produced by AI algorithms. For example, a predictive policing algorithm deployed in a racially biased criminal justice system may disproportionately target minority communities, exacerbating existing inequalities.



Understanding Bias in AI Decision-Making

Understanding the psychological mechanisms underlying bias in AI decision-making is crucial for developing effective strategies to mitigate its impact (Dwyer et al., 2018). Several cognitive and social psychological phenomena contribute to the emergence and perpetuation of bias in AI algorithms, including stereotypes, confirmation bias, implicit biases, and social influence processes.

Stereotypes are cognitive shortcuts that enable individuals to process information quickly but can also lead to biased judgments and decisions. AI algorithms may inadvertently learn and perpetuate stereotypes present in the training data, resulting in discriminatory outcomes. For example, a job recruitment algorithm may unfairly penalise candidates from underrepresented groups due to stereotypes about their abilities or qualifications.

Confirmation bias refers to the tendency to seek out, interpret, and remember information that confirms one's existing beliefs or hypotheses while ignoring contradictory evidence. In the context of AI decision-making, confirmation bias can lead algorithms to selectively attend to data that reinforce existing biases, further entrenching discriminatory patterns.



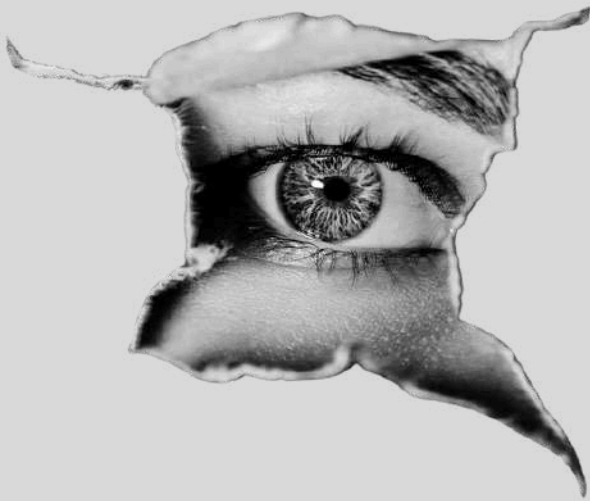
Implicit biases are unconscious attitudes or stereotypes that influence our perceptions, decisions, and behaviours. These biases operate without conscious awareness and can manifest in subtle ways, shaping the judgments of both individuals and AI systems. Addressing implicit bias in AI algorithms requires awareness, acknowledgment, and deliberate efforts to counteract its effects through techniques such as debiasing algorithms and diversifying training data.



Social influence processes, such as conformity and ingroup favouritism, play a significant role in shaping human behaviour and decision-making. In the context of AI, these social dynamics can influence the design, implementation, and deployment of algorithms, contributing to the perpetuation of bias. Collaborative approaches that involve diverse stakeholders and perspectives are essential for mitigating the influence of social biases on AI decision-making.

Strategies for Addressing Bias in AI Decision-Making:

Mitigating bias in AI decision-making requires a multifaceted approach that addresses the root causes of bias while promoting fairness, transparency, and accountability (Silberg & Manyika, 2019). Drawing on insights from psychology, several strategies can help mitigate bias and enhance the fairness and equity of AI algorithms.

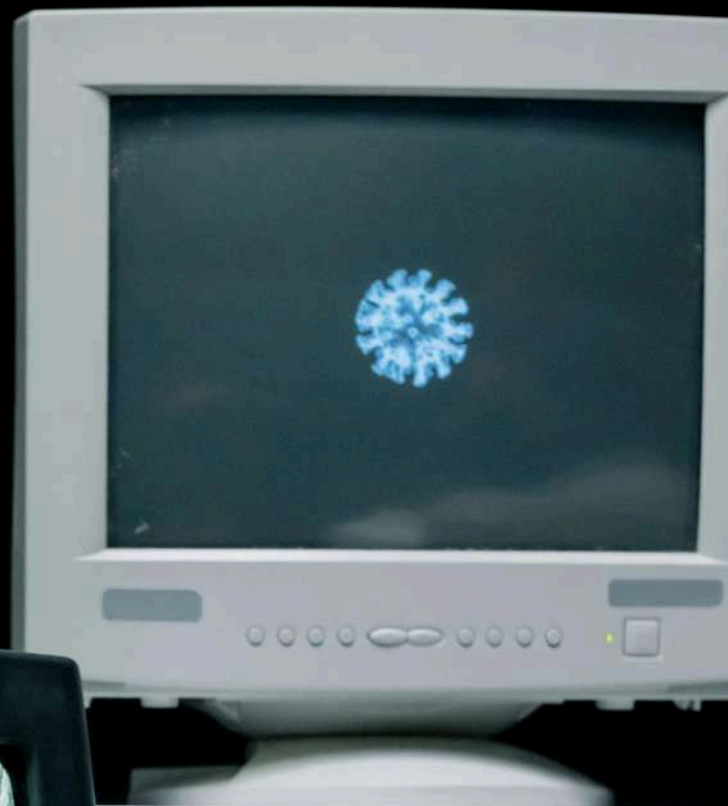


- **Diverse and Representative Data:** Ensuring that training data are diverse, representative, and free from biases is critical for reducing algorithmic bias. Data collection processes should be designed to capture the full range of relevant experiences and perspectives, including those of marginalized and underrepresented groups.
- **Algorithmic Transparency:** Promoting transparency in AI algorithms can increase accountability and enable stakeholders to understand how decisions are made. Providing explanations for algorithmic decisions, disclosing data sources and training procedures, and allowing for external auditing can enhance trust and facilitate the detection and correction of biases.
- **Bias Detection and Mitigation:** Implementing techniques for detecting and mitigating bias in AI algorithms is essential for promoting fairness and equity. These techniques may include pre-processing data to remove biases, adjusting algorithmic parameters to account for fairness considerations, and incorporating fairness constraints into the optimization process.
- **Diversity and Inclusion in AI Development:** Fostering diversity and inclusion in the development and deployment of AI systems can help mitigate biases and promote more equitable outcomes. Diverse teams with varied perspectives can identify and address biases that may go unnoticed by homogeneous groups, leading to more robust and inclusive AI solutions.



Conclusion

Addressing bias in AI decision-making is a complex and multifaceted challenge that requires interdisciplinary collaboration and a deep understanding of the psychological mechanisms underlying bias. By incorporating insights from psychology into the design, implementation, and deployment of AI algorithms, we can develop more equitable and fair systems that enhance human well-being and promote social justice. Through concerted efforts to mitigate bias and promote diversity, transparency, and accountability, we can harness the potential of AI to benefit society while minimizing its harmful impacts.



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