Artificial Intelligence Is Reshaping the Realm of 'Experience'

(经验 Jīngyàn) in Chinese Medicine, Forever.

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You can't gain knowledge without practical experience;
wisdom only comes with experience
不经一事，不长一智

bù jīng yī shì , bù zhǎng yī zhì

Chinese medicine relies on centuries of accumulated knowledge and expertise. This 'experience' (经验 Jīngyàn) [1] represents the distilled wisdom and intuition gained from engaging directly with patients. It considers their individual constitutions, symptoms, and responses to treatments. It encompasses theoretical knowledge and the ability to perceive patterns, diagnose complex conditions, and tailor treatments accordingly. This nuanced understanding is nurtured through extensive clinical practice and mentorship.

Human experience is valuable, but it is susceptible to individual bias, limitations, and errors[2]. Even experienced practitioners may overlook certain patterns or struggle with rare and complex cases. Moreover, gaining experience is a process that requires time, posing a challenge for inexperienced practitioners to attain the same level of expertise as their more experienced counterparts

Artificial Intelligence (AI) has been making waves across various industries, revolutionizing the way things are done. One such field that is experiencing a significant transformation is Chinese medicine and AI is reshaping forever the concept of 'experience' (经验 Jīngyàn) in the practice of

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Chinese medicine and it is important to emphasize that this development, despite understandable concerns and risks, should by no means be seen as bad news.

But, can AI truly capture the essence of the experiential knowledge developed by experienced practitioners? Can it replicate the deep insights that arise from years of observing patients, deciphering subtle cues, and navigating the intricate web of metaphors inherent in CCM?

As we witness the emergence of AI, it brings forth significant concerns regarding its potential impact on the acquisition of 'experience' ('经验' or 'Jīngyàn') among students and doctors, especially as the ongoing AI revolution approaches maturity. It becomes essential to undertake a critical examination of AI's role in expanding and enhancing the shaping of 'experience' ('经验' or 'Jīngyàn') within the realm of Chinese Medicine.

AI algorithms, such as machine learning models, can analyze complex medical data, identify patterns, and provide valuable insights to clinicians[3]. By leveraging AI's computational power and data processing capabilities, practitioners can enhance their decision-making processes and improve patient outcomes[4]. AI can already assist in areas such as tongue diagnosis, pulse analysis, herb selection, acupoint selection, and even suggest new acupoint combinations, offering objective measurements and evidence-based recommendations. It serves as a powerful tool that supports clinicians in their TCM practice, augmenting their knowledge and expanding their diagnostic capabilities. Developing "experience" (Jīngyàn) encompasses a profound understanding of the interconnectedness between the human body, mind, and spirit, informed by years of observation, study, and reflection. Therefore, it is essential to carefully integrate AI-generated insights within the framework of "experience" (Jīngyàn), allowing practitioners to contextualize and interpret the AI-driven results. The integration between AI and Chinese Medicine "experience" (Jīngyàn) synergistically harnesses the strengths of both approaches, significantly enhancing the accuracy and efficacy of diagnosis and treatment.

To understand this complex relationship, it is crucial to comprehend the fundamental differences between AI-driven algorithms used in diagnostics and the nuanced construct of “experience” 经验 (Jīngyàn) within clinical practice.

AI algorithms excel at processing large volumes of structured and unstructured data for diagnostic purposes. [5] However, in Chinese Medicine, the development and shaping of the so-called "experience" (经验, Jīngyàn) go beyond data-driven insights, encompassing a broader framework that integrates cultural and linguistic nuances, intuition, and a profound connection with the patient. Bridging the gap between the objective nature of AI algorithms and the subjective, context-dependent[6] nature of 经验 (Jīngyàn) is a major challenge in clinical practice.

Machines, including AI algorithms, do not possess subjective experiences, emotions, or the ability to grasp the intricate nuances of cultural context and metaphorical understanding. The concept of a "conscious" computer remains highly controversial and is subject to diverse

interpretations.[7] The definition of consciousness itself remains a topic of intense debate among philosophers, cognitive scientists, and neuroscientists.[8] Consequently, the notion of replicating consciousness in a machine is far from settled, and there is no unanimous consensus regarding the criteria for attributing consciousness or sentience to a machine.

On other hand, consciousness and sentience play a crucial role in the formation of "experience" 经验 (Jīngyàn) in Chinese Medicine. 经验 (Jīngyàn) is not merely a collection of factual knowledge, but a deep understanding that arises from the conscious interaction between the practitioner and the patient. It involves establishing a profound connection that goes beyond surface-level observations and embraces the subtle nuances of the patient's physical, emotional, and spiritual states. This heightened level of awareness and sensitivity is deeply connected to the essence of human consciousness, empathy, and the innate capacity to perceive and comprehend intricate cues that elude quantification or objective measurement.

AI algorithms are designed to process vast amounts of data, and perform specific tasks with high precision. However, they lack the subjective experiences, emotions, and intuitive understanding that are essential for the formation of 经验 (Jīngyàn). AI systems are driven by patterns and statistical correlations, which may yield accurate results but fail to capture the intricacies and individuality inherent in human healthcare.

While AI has made significant advancements in various fields, it remains bound by its inherent limitations. Currently, most of the AI models are trained on historical data and rely on predefined rules and algorithms.[9] As already mentioned, they excel at pattern recognition and can provide valuable insights based on statistical probabilities. However, the development of "experience" 经验 (Jīngyàn) in Chinese Medicine encompasses a deeper level of wisdom that emerges from the dynamic interactions between the practitioner and the patient in real-time. It involves adapting and tailoring treatments to suit the unique needs and responses of individuals, which requires a level of consciousness and sentience that AI currently lacks.

Currently, while AI algorithms are able to analyze voice patterns and sentiment to some extent[10] , they are still limited in their ability to interpret the full range of human emotions and subjective experiences. This limitation becomes particularly evident when patients are exposed to and need to adapt to certain environmental variables and conditions.[11]

Human emotions and subjective experiences are influenced by a multitude of factors, including cultural background, personal beliefs, social interactions, and environmental stimuli. These variables can significantly impact an individual's well-being and health.[12]

For example, a patient's emotional state and well-being may be influenced by their living conditions, workplace environment, or exposure to natural elements (like an excessive damp enviroment) . Traditional Chinese medicine recognizes the importance of considering these external factors and their potential impact on health. Practitioners with 经验 (Jīngyàn) take into

account the patient's unique circumstances, adapting treatments accordingly to address the holistic needs of the individual.

In contrast, despite some recent and promising progress[13] most of the AI algorithms still primarily rely on quantifiable and measurable data, such as patient records and test results. While these data sources are valuable, they may not capture the full breadth of environmental variables and their effects on a patient's well-being. This limitation hinders AI's ability to provide a comprehensive and personalized approach to healthcare that encompasses the intricate relationship between human emotions[14], subjective experiences, and the environment. Despite AI's precision and efficiency in analyzing data, it cannot fully replicate the depth and intuition that 经验 (Jīngyàn) brings to the practice of Chinese Medicine.

The term "Web of Metaphors" was coined by Professor Koji Nakatogawa (Hokkaido University Department of Philosophy/Logic Hokkaido - Japan) during a debate with Professor Friedrich Wallner (Philosophy of Science - University of Vienna - Austria) at the Sigmund Freud University in 2017 during the Intercultural Interdisciplinary Workshop on the Evaluation of Acupuncture. While originally used in a different context (logic and philosophy), I have since adopted this term and expanded its usage to represent a dynamic and emergent web of cultural context and metaphorical associations.
Key elements of Constructive Realism, such as the methodological strategy of “strangification”, the recognition of multiple metaphysical perspectives, and the importance of interdisciplinary approaches, provide a more technical argument to support the idea of a dynamic and emergent Web of Metaphors in Chinese Medicine. This philosophical perspective suggests that each web is influenced by culture, context, and individual experiences, shaping its meaning. By actively exploring the complexities of our individual Web of Metaphors, we can better understand its intricacies and utilize its potential for knowledge and cultural exchange. [15]In the practice of Chinese Medicine, the Web of Metaphors is a dynamic framework that constantly evolves, revealing various metaphorical components that emerge and change based on specific situations and environments. This complex network cannot be simplified, as it encompasses a diverse interplay of elements. It's important to note that a significant portion of these webs is distinct to each practitioner, while certain elements can be transmitted through generations and organized, resulting in the formation of "lineages"（or "xuépài" 学派）[16] and therefore expressed in recognizable patterns, particularly to practitioners belonging to that lineage. [17] Experienced practitioners possess the invaluable ability to navigate these/their Web of Metaphors and extract profound insights that may not be explicitly documented in medical records or databases. They have honed their interpretive skills to understand patients' descriptions and uncover underlying meanings that are crucial for accurate diagnoses and the development of personalized treatment plans.

An intriguing aspect of Chinese Medicine, as observed by Western scientists, is that different masters can achieve the same effectiveness in treating a particular clinical case using different approaches and prescriptions. This highlights the essential role of 'experience' (经验 or Jīngyàn) and their unique webs of metaphors in guiding their practice.

The unique insights and perspectives of experienced practitioners, honed through years of practice and accumulation of knowledge, contribute to their individual webs of metaphors. These webs allow them to interpret and navigate the complexities of patient presentations in a highly personalized manner, leading to effective treatments. The fact that different masters can achieve comparable results using their own unique approaches highlights the depth and richness of Classical Chinese Medicine.

These experienced doctors, through their mastery of the four examinations (四诊 sì zhěn), can effectively utilize the wealth of data represented by 征 (zhēng) and 象 (xiàng)[18]. By carefully analyzing the patient's observable signs and symptoms, pulse, tongue, and other diagnostic indicators, they are adept at discerning the underlying patterns and imbalances (辨证 biàn zhèng).[19]

It's important to recognize that AI has the potential to contribute to our understanding of Chinese Medicine and expand the possibilities available to us. By analyzing large volumes of data and recognizing patterns AI algorithms excel in efficiently processing enormous volumes of data and identifying statistical patterns in near-real time [20], and help uncover hidden correlations and provide valuable insights that can enhance clinical decision-making. However, it's worth noting that AI systems rely on predefined algorithms and, despite recent advancements, they still struggle to effectively interpret metaphoric language and grasp contextual understanding.[21] Furthermore, it is crucial to acknowledge that, at the time of writing this paper, no AI system possesses inherent curiosity or the ability to be surprised by default[22]. Although in some healthcare scenarios this absence of characteristics contributes to the solidity and robustness of these systems, it also presents a risk of dehumanizing and alienating treatment strategies. Hence, it is crucial to promote the continuous development of 经验 (Jīngyàn) by embracing the transformative potential of the AI revolution, while also preserving the essential human and cultural elements that shape it.

In Traditional Chinese Medicine (TCM), each patient can be seen as a constellation of highly granular, intricately interconnected and ever-evolving data points. This view recognizes that patients are complex and multifaceted, comprising various interconnected factors that are constantly changing.

AI can assist TCM practitioners in harnessing the advantages of high granular data while simultaneously addressing the inherent challenges associated with it, rather than imposing oversimplifications that may inadvertently overlook valuable and pivotal insights. By integrating AI technologies into TCM practice, practitioners can harness the power of machine learning,

data analysis, and predictive modeling to augment their expertise and improve patient outcomes[23]. AI systems can assist in identifying patterns, predicting treatment responses, and offering personalized recommendations based on the analysis of highly granular data, serving as a valuable resource for TCM practitioners. This integration enables practitioners to make more informed decisions, optimize treatment plans, and enhance the overall quality of care.

However, as previously discussed, while state-of-the-art AI technologies provide valuable insights in processing and analyzing highly detailed data, they cannot replace the human element, intuition, and profound understanding of cultural and metaphorical associations that characterize the practice of Chinese Medicine. The integration of AI should be regarded as a supportive tool that enhances the capabilities of practitioners, expediting the development of 经验 (Jīngyàn) or even enabling new methods of acquiring and cultivating it, rather than a set of impersonal and precise solutions aimed at completely replacing the human element and intuitive discernment that 经验 (Jīngyàn) provides.

It is vital to act promptly to prevent any potential harm and protect the core principles of Chinese Medicine. We must ensure that practitioners do not become biased, disconnected from patients, dehumanized, or distorted in their approach. We should not simply accept this situation as the new normal; instead, we must take proactive steps to address these issues.
Striking a careful balance between leveraging the benefits of AI and preserving the human touch in healthcare is of utmost importance. This approach is important to ensure that practitioners are trained correctly and to protect the valuable wisdom of 经验 (Jīngyàn) in Chinese Medicine. We should not sacrifice it for the sake of speed, optimization, or quick insights. It is crucial to integrate AI technologies into Chinese Medicine while maintaining the integrity and depth of 经验 (Jīngyàn), preserving its essence, and ensuring compassionate and holistic care for patients.

Explainable AI (XAI) [24] can also enhance the patient-practitioner relationship and strengthen the patient's commitment to their treatment. While this paper primarily focuses on the experiences of practitioners and students, it is crucial to acknowledge the central role of the patient. By integrating AI tools that clearly and transparently explain the treatment process to patients,[25] their engagement and trust can be strengthened. This approach highlights the patient's experience as a key motivator for practitioners to deliver effective and personalized care.

The integration of AI in Chinese Medicine brings both opportunities and challenges. On one hand, these technological advancements have the potential to enhance knowledge, reveal patterns in data, and offer valuable insights through advanced data processing. However, it is crucial to approach this integration with caution and avoid excessive reliance on AI tools. It is the responsibility of universities, research centers, and think tanks to raise awareness about the risks involved and provide guidance for a safe and beneficial integration. This applies not only to Chinese Medicine but also to other traditional healing systems such as Indian Ayurveda, Korean Medicine, Thai Medicine, and others.

By combining human 经验 (Jīngyàn) with AI, we create a powerful synergy that takes advantage of the strengths of both. AI offers valuable insights and data-driven analysis, while human practitioners contribute their empathy, intuition, and deep understanding of cultural and metaphorical associations. This integration is transforming the field of Chinese Medicine, with the potential to improve diagnosis, treatment planning, and patient care. It enhances practitioners' knowledge, integrates traditional wisdom with modern research, supports complex cases, facilitates continuous learning, saves time, improves efficiency, enables global collaboration, and utilizes detailed patient data. Embracing the AI revolution carefully allows Chinese Medicine to benefit from technological advancements while providing effective and personalized care to patients.

Endnotes

1. The term '临床经验' or 'línchuáng jīngyàn' specifically refers to the clinical experience in Chinese medicine and would be the more appropriate term in a clinical context. But for the purpose of this discussion, I have opted for the broader term 经验' or 'Jīngyàn' to encompass the cultural, metaphorical, and holistic elements that contribute to the deep understanding and intuition inherent in Chinese medicine.
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2. See Gustavo Saposnik et al., "Implicit bias in healthcare: clinical practice, research and decision making" (Future Healthc J., vol. 8, no. 1, 2021, pp. 40–48, doi:10.7861/fhj.2020-0233), as well as their systematic review on cognitive biases associated with medical decisions (BMC Medical Informatics and Decision Making, vol. 16, 2016, article 138, doi:10.1186/s12911-016-0367-9). Additionally, refer to Alaa Althubaiti's work on information bias in health research, which provides insights into its definition, pitfalls, and adjustment methods (Journal of Multidisciplinary Healthcare, vol. 9, 2016, pp. 211-217, doi:10.2147/JMDH.S104807).
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13. See "Beyond Big Data for Health Care with Data Science Pipelines" from CloudGeometry, available at: https://cloudgeometry.io/blog/beyond-big-data-for-health-care-with-data-science-pipelines
14. See McStay, Andrew. "Emotional AI is an umbrella term for any technology that uses affective computing and artificial intelligence to make an assessment or a prediction about a person’s emotional state or feelings based on data such as 'words, pictures, intonation, gestures, physiology and facial expressions.'" Cited in "Emotional AI: A Systematic Review and Future Research Agenda," by Andrew McStay, Springer, 2022, https://link.springer.com/article/10.1007/s00146-022-01435-w, p. 1.
15. See Wallner, Fritz. "A New Vision of Science." University of Vienna. Available at: https://www.bu.edu/wcp/Papers/Scie/ScieWall.htm#top.
16. The term "xuépài" (学派) refers to a school of thought or a specific lineage within a particular field of study or practice. In the context of Chinese Medicine, it is often used to describe the different approaches, theories, and methodologies followed by various practitioners or groups. These schools of thought may have distinct philosophies, diagnostic methods, treatment modalities, and formulations of herbal medicine.
17. See Scheid, Volker. Currents of Tradition in Chinese Medicine, 1626-2006. Eastland Press, 2007.
See also Unschuld, Paul U. and Bridie J. Andrews (trans). Traditional Chinese Medicine: Heritage and Adaptation. New York: Columbia University Press, 2018.
18. 征 (zhēng) refers to the observable signs and symptoms that manifest in the patient's body, such as facial complexion, body temperature, and physical appearance. 象 (xiàng) encompasses the metaphorical and symbolic associations that arise from these signs and symptoms, providing deeper insights into the patient's condition. Together, 征 (zhēng) and 象 (xiàng) form a comprehensive framework for understanding the patient's health status and guiding the discernment (辨证 biànzhèng) of patterns and imbalances. These concepts are fundamental to the practice of Chinese Medicine and play a significant role in tailoring individualized treatment plans.

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24. A practical example is Local Interpretable Model-Agnostic Explanations (LIME): LIME provides explanations for individual predictions by estimating how the model behaves around a specific instance. It helps clinicians understand how the AI model makes specific decisions for patients, contributing to their own Experience (经验 Jīngyàn) by adding context to AI-driven insights.
25. Various technological advancements, such as apps, virtual assistants, chatbots, smart wearables, health monitoring apps, augmented reality (AR) applications, and more, have emerged to support and enhance healthcare practices

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