ARTIFICIAL INTELLIGENCE IS RESHAPING THE REALM OF 'EXPERIENCE' (经验 JĪNGYÀN) IN CHINESE MEDICINE, FOREVER

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ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАРДИНАЛЬНО МЕНЯЕТ ОБЛАСТЬ 'ОПЫТА' (经验 JĪNGYÀN) В КИТАЙСКОЙ МЕДИЦИНЕ, НАВСЕГДА

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Artificial Intelligence (AI) is transforming the concept of 'Experience' (经验 Jīngyàn) in Chinese Medicine. Knowledge is often rooted in practical experience, and wisdom is derived from such experiences. Historically, Chinese medicine has been based on direct patient interactions. This methodology evaluates individual symptoms, treatment responses, and the overall constitution of the patient. The discipline integrates theory, pattern recognition, diagnosis, and personalized treatments. This understanding is enhanced through hands-on clinical practice. The term '临床经验' or 'línchuáng jīngyàn' specifically denotes clinical experience in the context of Chinese medicine.

Keywords: AI (*Artificial Intelligence*), *Chinese medicine, Experience,* **Jīngyàn**, *Diagnosis, Treatment, Accuracy*

Искусственный интеллект (ИИ) трансформирует понятие «опыт» (经验 Jīngyàn) в китайской медицине. Знание часто коренится в практическом опыте, а мудрость черпается из этого опыта. Исторически сложилось так, что китайская медицина основана на непосредственном взаимодействии с пациентами. При этом оцениваются индивидуальные симптомы, реакция на лечение и общая конституция пациента. Эта дисциплина объединяет теорию, распознавание паттернов, диагностику и индивидуальное лечение. Это понимание расширяется через практическую клиническую практику. Термин «临床经验» или «línchuáng jīngyàn» относится именно к клиническому опыту в контексте китайской медицины.

Ключевые слова: искусственный интеллект, китайская медицина, опыт, Jīngyàn (Дзингянь), диагностика, лечение, точность

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 is based on centuries of practical knowledge. This 'experience' (经验 Jīngyàn) [1] comes from direct patient interactions. It focuses on individual symptoms, responses to treatments, and patient makeup. It involves theory, pattern recognition, diagnosis, and personalized treatments. This understanding is developed through hands-on clinical practice and guidance. The term '临床经验' or 'línchuáng jīngyàn' specifically refers to the clinical experience in Chinese medicine and is the more appropriate term in a clinical context. However, for the purpose of the discussion, the broader term '经验' or 'Jīngyàn' is chosen to encompass the cultural, metaphorical, and holistic elements that contribute to the deep understanding and intuition inherent in Chinese medicine.

Human experience is valuable but can be biased and error-prone [2, 3]. Even seasoned professionals can miss patterns or find certain cases challenging. Gaining experience takes time, making it hard for new practitioners to match the expertise of veterans. AI is changing many industries, including Chinese medicine. It's altering how we view 'experience' (经验 Jīngyàn) in this field. Despite concerns, this change is not necessarily negative.

Can AI truly understand the knowledge held by seasoned practitioners? Can it match the insights from years of patient interactions in CCM?

With the rise of AI, there are concerns about its effect on the practical experience of students and doctors in Chinese Medicine. We need to look closely at how AI impacts the development of experience in this field.

AI models can process medical data, spot trends, and give insights to doctors [4].

Using AI's ability to handle vast amounts of data, healthcare professionals can better their decision-making and improve patient outcomes [5].

AI aids in tongue diagnosis, pulse analysis, herb selection, acupoint selection, and suggesting new acupoint combinations, giving factual measurements and evidence-backed advice. It's a strong tool that boosts clinicians in their TCM practice, adding to their expertise and widening their diagnostic reach. Gaining «experience» (Jīngyàn) involves a deep grasp of the relationship between the body, mind, and spirit, built on years of study and observation. So, it's important to mix AI's findings with this «experience» (Jīngyàn) so that practitioners can properly place and understand the AI outcomes. Using AI with Chinese Medicine improves accuracy in diagnosis and treatment.

Recognizing the relationship between AI's diagnostic algorithms and the «experience» 经验 (Jīngyàn) in clinical practice is vital. AI algorithms excel at processing large

volumes of structured and unstructured data for diagnostic purposes [6, 7]. 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 nature [8] 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 [9]. The definition of consciousness itself remains a topic of intense debate among philosophers, cognitive scientists, and neuroscientists [10]. 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.

Consciousness and sentience are key to forming «experience» 经验 (Jīngyàn) in Chinese Medicine. 经验 (Jīngyàn) goes beyond mere factual knowledge; it arises from the interaction between the practitioner and the patient. It means deeply connecting with the patient's physical, emotional, and spiritual states. This connection is tied to human consciousness, empathy, and the ability to understand intricate cues that can't be easily measured.

AI algorithms process a lot of data and are precise in their tasks. Yet, they don't have the emotions, subjective experiences, or intuition required for 经验 (Jīngyàn). AI focuses on patterns and correlations, often missing the unique aspects of 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 [11]. As already mentioned they excel at pattern recognition and provide insights based on statistical probabilities. However, the «experience» 经验 (Jīngyàn) in Chinese Medicine goes far beyond this. It fundamentally emerges from (human) interactions between the practitioner and the patient. Treatments are adapted to fit the unique needs and responses of individuals, something AI currently can't achieve. Currently, while AI algorithms are able to analyze voice patterns and sentiment to some extent [12], 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 [13].

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 [14].

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 environment). Traditional Chinese medicine recognizes the importance of considering these external factors and their potential impact on health. Practitioners use their the clinical «experience» 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 [15], most AI algorithms still rely primarily on quantifiable and measurable data, such as patient records and test results. While these data sources are invaluable, they might not encompass the full scope of environmental variables affecting a patient's well-being. Moreover, despite the precision and efficiency of AI in analyzing data, it cannot fully emulate the depth and intuition that 经验 (Jīngyàn) brings to the practice of Chinese Medicine.

This limitation hinders AI's ability to provide a comprehensive and personalized approach to healthcare that encompasses the intricate relationship between human emotions, subjective experiences, and the environment. 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 [16].

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 [25]. 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. Chinese Medicine is a complex system where each practitioner has unique methods, but there are shared practices passed down through generations. This leads to the formation of «xuépài» (学派) or

schools of thought. In Chinese Medicine, «xuépài» represents different approaches and theories. Practitioners within the same «xuépài» tend to have recognizable patterns in their methods and treatments [17, 18]. Experienced practitioners have a valuable skill in navigating their Web of Metaphors to extract key insights not always found in medical records or databases. They've sharpened their abilities to understand patients' descriptions and find essential meanings vital for accurate diagnoses and personalized treatment plans.

An interesting aspect of Chinese Medicine noted by Western scientists is that different masters can treat the same clinical case effectively with varied approaches and prescriptions. This emphasizes the critical role of 'experience' (经验 or Jīngyàn) and their specific webs of metaphors in their practice.

The deep knowledge and perspectives of experienced practitioners, built over years of practice, add to their individual webs of metaphors. These networks help them interpret and manage the complexities of patient cases in a tailored way, resulting in effective treatments. Diverse methods yielding similar results highlight the depth and breadth 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). 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 biàn zhèng) of patterns and imbalances. These concepts are fundamental to the practice of Chinese Medicine and play a significant role in tailoring individualized treatment plans. 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.

While AI has made significant advancements in various sectors such as finance, national security, healthcare, and transportation, it still operates within the boundaries set by its programming and lacks human qualities like curiosity, judgment, and intention [21, 22].

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 [23] 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 outcome [23]. AI systems can help identify patterns, predict treatment responses, and give personalized recommendations based on detailed data analysis, becoming a crucial tool for TCM practitioners. This use of AI allows for more precise decision-making, better treatment plans, and improved patient care.

However, even the most advanced AI technologies can't substitute the human touch and deep understanding of the cultural and symbolic connections that define Chinese Medicine. AI should be seen as a tool to boost practitioners' skills, speeding up the development of 经验 (Jīngyàn) and fostering new ways to attain it, not as a precise solution set meant to entirely replace the human intuition and insight offered by 经验 (Jīngyàn).

Immediate action is essential to avoid harm and uphold Chinese Medicine's core principles. We need to be vigilant against practitioners becoming biased, losing patient connection, or straying from their foundational approach. Passive acceptance isn't an option; active measures are necessary.

Maintaining the right balance between AI benefits and the human aspect in healthcare is crucial. Ensuring practitioners receive the right training and safeguarding the precious insights of 经验 (Jīngyàn) in Chinese Medicine is paramount. We shouldn't compromise it for efficiency or quick results. Integrating AI into Chinese Medicine requires preserving 经验 (Jīngyàn)'s core, ensuring thorough care for patients.

Explainable AI (XAI) 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 stu-

dents, it is crucial to acknowledge the central role of the patient. 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 [24]. By integrating AI tools that clearly and transparently explain the treatment process to patients, their engagement and trust can be strengthened. 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. 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.

Combining human 经验 (Jīngyàn) and AI creates a strong partnership that leverages the best of both. AI delivers insights and data analysis, and humans add empathy, intuition, and knowledge of cultural associations. This blend is reshaping Chinese Medicine, offering better diagnosis, treatment plans, and patient care. It boosts knowledge, combines traditional and modern research, aids in complex cases, promotes continuous learning, saves time, raises efficiency, fosters global partnerships, and taps into detailed patient data. Adopting AI advancements can help Chinese Medicine offer improved, tailored patient care.

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