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Contemporary Methodologies and Analytical Frameworks in the Digital Age in Psychological Inquiry

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Abstract

The field of psychology is currently undergoing a foundational transformation, shifting from traditional group-level cross-sectional designs to intensive, person-specific longitudinal frameworks that prioritize ecological validity and predictive precision. This evolution is driven by the rapid proliferation of digital technologies, including mobile sensors and smartphones, which allow for the capture of human experience in real-time naturalistic settings. This report examines the predominant trends characterizing the 2020–2026 period, specifically focusing on the integration of Ecological Momentary Assessment (EMA) and Experience Sampling Methodologies (ESM). It further explores the sophisticated analytical engines required to process these dense data streams, most notably Dynamic Structural Equation Modeling (DSEM) and multilevel vector autoregressive models. The rise of machine learning and artificial intelligence is analyzed in the context of precision mental health, highlighting the potential for high-accuracy symptom prediction alongside the critical need for explainable AI (XAI) to overcome the "black box" limitations of complex algorithms. Furthermore, the report delineates the shift toward network psychometrics, which conceptualizes psychological constructs as dynamic systems of interacting components rather than latent entities. The report also addresses the "robustness revolution" through the adoption of multiverse and specification curve analyses to quantify analytical uncertainty. The epistemological transition from frequentist to Bayesian inference is discussed, emphasizing its utility in handling small-sample designs and complex data structures. Finally, the overarching influence of the Open Science movement is discussed as a cultural reform prioritizing transparency and reproducibility. By synthesizing these advancements, this report provides a comprehensive overview of how contemporary methodologies are reshaping the theoretical and empirical landscape of psychological science to better capture the kinematics and dynamics of the human mind.

Keywords: Network Psychometrics, Psychological Inquiry, Contemporary Methodologies, Dynamic Structural Equation Modeling, Ecological Momentary Assessment.

Introduction

The historical reliance on retrospective self-reports has long been recognized as a significant limitation in psychological research, primarily due to the systematic distortions introduced by recall bias. In response, the field has increasingly adopted intensive longitudinal designs (ILDs) that facilitate the collection of data in real-time or near-real-time within the participants' natural environments. Two primary methodologies dominate this space: Ecological Momentary Assessment (EMA) and the Experience Sampling Method (ESM). While these terms are frequently used interchangeably, their origins and specific research focuses offer nuanced distinctions that are critical for modern study design (Tay, 2026).

Experience Sampling Method (ESM) was traditionally rooted in the desire to capture a representative overview of an individual's typical activities, subjective experiences, and psychological states throughout a normal day (Tay, 2026). The emphasis in ESM is on representativeness—authentically documenting life as it happens to understand the frequencies and general levels of psychological phenomena within a target population. In contrast, Ecological Momentary Assessment (EMA) originated from clinical and health psychology contexts, spearheaded by researchers such as Arthur Stone and Saul Shiffman (Tay, 2026). The primary objective of EMA is the real-time monitoring of specific behaviors or symptoms to understand their momentary fluctuations, trajectories, and the contextual triggers that influence them (Shiffman et al., 2008).

The technological transition from paper diaries to smartphone-based applications has revolutionized the feasibility of these methods. Modern EMA utilizes digital triggers to collect timely, in-situ information, thereby overcoming the cognitive biases inherent in traditional survey methods where participants must summarize their feelings over the past week or month (Stone & Shiffman, 1994). This "momentariness" provides a dynamic snapshot of daily life, allowing researchers to explore the temporal dynamics of human decision-making and the complex interplay between environment and emotion (Pauer et al., 2026).

Sampling Protocols and Implementation

Current research often utilizes three primary sampling designs to capture these dynamics (APA, 2020; Shiffman et al., 2008):

- **Signal-Contingent Sampling:** Participants are prompted at random intervals within fixed time windows. This design is optimal for ESM studies aiming for a representative snapshot of the day (Tay, 2026).
- **Event-Contingent Sampling:** Participants initiate a report whenever a specific event occurs, such as a panic attack, social conflict, or substance use (Shiffman et al., 2008). This is vital for capturing rare but significant psychological phenomena.

- **Time-Contingent Sampling:** Assessments occur at fixed, predetermined times (e.g., every morning at 8:00 AM). This is often used for daily diary components of a study (Tay, 2026).

The advantages of these methodologies are manifold. By capturing data in the moment, EMA ensures improved data reliability and provides deep contextual insights that reveal nuanced patterns occurring in real-world settings (Trull & Ebner-Priemer, 2013). Researchers can tailor protocols to track specific mental health symptoms, such as the daily fluctuations associated with anxiety or the emotional triggers that precede substance use (Serre et al., 2015; Wenzel et al., 2009). However, the complexity of ILDs also introduces significant challenges. Sustained participant engagement is a primary concern, as intensive sampling can be intrusive and lead to attrition (Heron & Smyth, 2010). Furthermore, the voluminous and nested nature of the data requires sophisticated statistical methods that go beyond the capabilities of traditional regression or ANOVA (Bolger & Laurenceau, 2013).

Analytical Frameworks for Intensive Longitudinal Data: The Rise of DSEM

The shift toward intensive data collection has necessitated a corresponding evolution in statistical modeling. Standard longitudinal approaches, such as growth curve modeling, often fail to account for the intricate temporal dependencies found in data collected multiple times per day. Consequently, Dynamic Structural Equation Modeling (DSEM) has emerged as a pivotal framework, integrating the strengths of time-series analysis, multilevel modeling (MLM), and structural equation modeling (SEM) (Asparouhov et al., 2018).

DSEM is particularly adept at handling intensive longitudinal data (ILD) because it allows for the simultaneous modeling of within-person processes and between-person differences. At the within-person level, DSEM employs autoregressive (AR) models to quantify the "inertia" of a psychological state—that is, how much a person's current state (e.g., mood at time t) is predicted by their previous state (at time $t-1$) (Hamaker et al., 2018). For a stationary process, this is often represented as:

$$Y_{it} = \mu_i + \phi_i (Y_{i,t-1} - \mu_i) + \epsilon_{it}$$

In this notation, Y_{it} represents the observed score for individual i at time t , μ_i is the individual's long-term mean, ϕ_i is the autoregressive coefficient (inertia), and ϵ_{it} is the residual or "shock" variance (Hamaker & Wichers, 2017). DSEM allows these parameters—the mean, the inertia, and the variance—to be treated as random effects, meaning they can vary between individuals and be predicted by other person-level variables (Asparouhov & Muthén, 2022).

Estimation and Data Requirements

The choice between one-step and two-step estimation approaches in DSEM is a subject of significant methodological debate. In a one-step DSEM, the within-person dynamic model and the between-person model are estimated simultaneously (Fang et al., 2025). This approach is generally preferred as it accounts for the uncertainty in the within-person estimates when modeling between-person relations. However, one-step estimation can be computationally demanding and prone to non-convergence in complex models. A two-step approach involves first extracting dynamic component estimates (like the individual ϕ_i values) and then relating them to predictors in a second step.

Research suggests that two-step DSEM without the use of auxiliary variables often exhibits estimation bias and deflated Type I error rates (Fang et al., 2025). Conversely, when sufficient data are available—typically at least 30 time points and 100 individuals—one-step DSEM and two-step DSEM with auxiliary variables yield highly satisfactory and robust results (Fang et al., 2025). Furthermore, handling missing data in DSEM remains a critical challenge, as typical EMA compliance rates can range from 70% to 90%, necessitating robust imputation methods or full information maximum likelihood (FIML) approaches adapted for time-series dependencies (Asparouhov & Muthén, 2022).

Recent advances have further extended these models. Dynamic Latent Class Structural Equation Modeling (DLCSEM) has been introduced to capture categorical shifts in psychological states over time (McNeish & Hamaker, 2020). By incorporating Hidden Markov Switching Models, DLCSEM can identify latent "states" that an individual may transition between, such as moving from a state of "high arousal distress" to "demoralization" (Hasan et al., 2025). This capability is transformative for clinical psychology, as it allows for real-time classification of an individual's mental state, facilitating prompt and personalized interventions (McNeish & Hamaker, 2020).

Machine Learning and the Pursuit of Predictive Precision

The integration of Machine Learning (ML) and Artificial Intelligence (AI) into psychological research has opened new avenues for the detection and prediction of mental health conditions. Unlike traditional statistical models that focus on explaining the relationships between variables, ML prioritizes predictive accuracy and is capable of identifying complex, non-linear patterns in high-dimensional datasets (Speck et al., 2026).

In the domain of anxiety prediction, ML algorithms have demonstrated remarkable performance. For instance, studies using ensemble techniques like Random Forest and Gradient Boosting have reached accuracy rates as high as 98% in identifying anxiety symptoms (Priya et al., 2020; Sajja, 2021). These models often

leverage multimodal data, including self-report scores, physiological markers (e.g., heart rate variability, electrodermal activity), and digital behavioral traces from social media usage (Hasan et al., 2025; Qasrawi et al., 2022).

The utility of ML extends to predicting treatment responses, particularly for Cognitive Behavioral Therapy (CBT). Meta-analyses of studies predicting CBT response in anxiety disorders have shown an overall accuracy of approximately 74%, with models incorporating neuroimaging and clinical markers achieving even higher sensitivities (Hasan et al., 2025). Identifying potential responders in advance allows clinicians to optimize treatment planning and support data-informed decision-making in precision mental health contexts (Hasan et al., 2025).

Addressing the "Black Box" with Explainable AI (XAI)

A significant barrier to the clinical adoption of ML is the "black box" nature of complex algorithms. To address this, researchers are turning to Explainable AI (XAI) frameworks like SHAP (SHapley Additive exPlanations) and LIME (Local Interpretable Model-agnostic Explanations) (Speck et al., 2026). These tools provide a transparent mapping between digital indicators and mental health risk, identifying which specific markers—such as late-night social media usage, passive scrolling, or screen time duration—are driving a prediction of psychological distress (Hasan et al., 2025; Speck et al., 2026). This transparency is essential for informing personalized digital interventions and ensuring that clinicians can trust and act upon the model's output (Speck et al., 2026).

However, the "hype" surrounding ML in psychology is often tempered by the reality of psychological data quality. A significant simulation study revealed that flexible, tree-based ML models only consistently outperform simpler regularized regression models (like Elastic Net) under ideal conditions: large sample sizes ($N \geq 1,000$), high measurement reliability, and very strong effect sizes (Speck et al., 2026). Under more typical research conditions—characterized by small samples and measurement error—traditional linear models often perform just as well or even better (Speck et al., 2026).

Network Psychometrics: Psychological Phenomena as Systems

A radical departure from traditional latent variable modeling is the emergence of network psychometrics. While traditional models assume that observed symptoms are reflections of an underlying, unobservable disorder, the network approach posits that psychological constructs are systems of causal, interacting components (Borsboom et al., 2021). In this view, "Depression" is not the cause of insomnia and fatigue; rather, the interaction between insomnia and fatigue *is* part of what constitutes the depression network.

Exploratory Graph Analysis (EGA) has become a primary tool for identifying the structure of these networks. EGA uses the graphical LASSO (Least Absolute

Shrinkage and Selection Operator) to estimate the partial correlation matrix between variables and then applies community detection algorithms, such as the Walktrap algorithm, to identify clusters of nodes that represent psychological dimensions (Golino & Epskamp, 2017). This approach is often more accurate than traditional factor analysis in determining the correct number of dimensions in a dataset, especially when items are highly interconnected (Golino et al., 2020).

Clinical and Theoretical Insights

The network perspective has provided deep insights into the structure of well-being and psychopathology. For example, network analyses of well-being indicators in large population-based samples have revealed "fuzzy boundaries" between theoretical domains, with many indicators belonging to multiple clusters (Wongvorachan & Bulut, 2024). In clinical research, network analysis allows for the identification of "bridge nodes"—symptoms that link different disorders. A study on undergraduate cadets found that psychological resilience acts as a core bridge node linking Big Five personality traits to symptoms of depression and anxiety, suggesting that interventions targeting resilience could have widespread protective effects across the network (Zhang et al., 2024).

Dynamic EGA has recently extended this framework to assess how the structure of a psychological system evolves over time or across different units of assessment (Wongvorachan & Bulut, 2024). This is invaluable for personalizing interventions, as a patient's "symptom connectivity" may weaken during successful therapy, signaling a move toward a more resilient mental health state (Cheng et al., 2024). To ensure generalizability, researchers employ Bootstrap EGA (bootEGA) to generate sampling distributions of results, providing statistics on the structural consistency and stability of the empirical dimensions (Golino & Epskamp, 2017).

The Robustness Revolution: Multiverse and Specification Curve Analysis

As psychological science grapples with the "replication crisis," two powerful analytical approaches have gained prominence for addressing researcher flexibility: Multiverse Analysis and Specification Curve Analysis (SCA). These methods aim to quantify how much a research finding depends on arbitrary choices made during data cleaning and analysis (Simonsohn et al., 2020; van Dijk et al., 2021).

A **Multiverse Analysis** involves performing the intended analysis across the entire set of "all reasonable" data sets that arise from different defensible processing choices (e.g., different ways of handling outliers, coding variables, or defining inclusion criteria) (van Dijk et al., 2021). By explicitly reporting results across these variations, researchers can identify which specific analytical decisions the effect is robust or sensitive to. Similarly, **Specification Curve Analysis (SCA)** parameterizes and systematically tests all possible statistically valid study design specifications (Simonsohn et al., 2020). The resulting "curve" displays the estimated effect sizes

across all specifications, providing a visual and statistical summary of the robustness of a theoretical claim (Simonsohn et al., 2020).

These approaches are transformative because they move beyond the presentation of a single "p-value" to a more honest disclosure of analytical uncertainty. Recent work has demonstrated that broad narratives—such as the link between social media use and teen mental health—often vanish or change direction depending on the specific specifications used, highlighting the need for these methodologies to avoid oversimplified conclusions (Sewall & Parry, 2024; van Dijk et al., 2021).

The Bayesian Turn and Sequential Research Designs

A significant epistemological shift is occurring in psychology as researchers increasingly adopt Bayesian inference as an alternative to frequentist methods. While frequentist statistics focus on the long-run frequency of data given a fixed parameter, Bayesian statistics focus on updating the probability of a parameter given the observed data (Wagenmakers et al., 2008).

One of the most notable advantages of Bayesian methods is their performance in small-sample contexts, such as single-case experimental designs (SCEDs). Frequentist methods often rely on large-sample asymptotic assumptions that are frequently violated in these designs, leading to biased estimates. Bayesian estimation, however, can use informative or weakly informative priors to bolster Level-2 variance component estimation, making it a robust alternative for researchers handling complex data structures with few participants (McNeish, 2016).

The Bayesian framework also facilitates sequential research designs, which allow researchers to stop data collection once pre-specified decision criteria are met. Unlike the frequentist approach, where "p-hacking" or multiple looks at the data can inflate Type I error rates, Bayesian sequential designs provide a principled way to update beliefs as data accumulates (Wagenmakers et al., 2008). This is particularly useful in clinical trials, where Bayesian adaptive designs can improve efficiency and ethical oversight by stopping early for efficacy or futility (Tay, 2026).

Open Science: Reforming the Research Culture

The Open Science movement, emerged as a response to the "replication crisis," aims to reform the entire ecosystem of research to prioritize transparency, rigor, and accessibility (Nosek et al., 2012). The crisis was fueled by "researcher degrees of freedom"—the inherent flexibility in designing and analyzing studies that can lead to a high prevalence of false positives (Vazire, 2018).

The movement has introduced several core practices that are now becoming standard:

- **Preregistration:** Creating a time-stamped plan of research questions and analysis strategies before data collection begins (van Dijk et al., 2021).
- **Registered Reports (RRs):** Methodology is peer-reviewed and accepted for publication *before* results are known, rewarding design quality over novelty (Nosek et al., 2012).
- **Open Data and Code:** Sharing analysis scripts and raw data to ensure scientific knowledge is a public good (Parsons et al., 2022).
- International initiatives, such as the UNESCO Recommendation on Open Science (2021), are providing structural support for this transition (Parsons et al., 2022). While challenges remain for early-career researchers (ECRs) who face institutional barriers, the movement is successfully democratizing knowledge and fostering a sense of community within the scientific community (Syed, 2025; Allen & Mehler, 2019).

Precision Mental Health and the Path Forward

The convergence of intensive longitudinal data, dynamic modeling, and predictive analytics is culminating in the field of Precision Mental Health (PMH). PMH extends evidence-based practice by combining systematic measurement with predictive analytics to deliver "the right intervention, at the right time, for the right person" (Schwartz et al., 2021). This is increasingly vital as evidence suggests that nearly half of patients undergoing traditional psychological therapy fail to achieve clinically meaningful improvements (Schwartz et al., 2021).

Projects like NOVA (Navigating Outcomes via Analytics) illustrate the future of this field. By integrating stakeholder-informed clinician tools and robust predictive models, PMH is moving into routine psychotherapy (Schwartz et al., 2021). This transition is supported by the availability of "digital traces"—passive indicators of mood collected from smartphones—which allow for early detection of distress before symptoms become acute (Hasan et al., 2025). As the field moves toward 2026, innovation must be paired with strong ethical oversight and commitment to clinical validation to ensure that the "high-tech makeover" of psychological data analysis truly benefits the individuals at the heart of the science (APA, 2026).

Conclusion

The current state of psychological research methodology is characterized by a move toward the intensive, the dynamic, and the transparent. The adoption of EMA and ESM has fundamentally altered our ability to capture the "kinematics" of what happens in an individual's life and the "dynamics" of why it happens (Bolger & Laurenceau, 2013). These dense data streams are no longer seen as a burden but as a rich source of insight, provided they are analyzed using appropriate frameworks like DSEM and network psychometrics. The next decade of psychological inquiry will

likely be defined by how well we can synthesize these diverse methodologies into a unified, evidence-based framework for understanding the human condition.

References

1. Allen, P. J., & Mehler, D. M. A. (2019). Open science challenges, benefits and tips in early career and beyond. *PLOS Biology*, *17*(5), e3000246.
2. American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.).
3. American Psychological Association. (2026, March). AI health advisory: Potential risks of chatbots and wellness apps. *Monitor on Psychology*.
4. Asparouhov, T., Hamaker, E. L., & Muthén, B. (2018). Dynamic structural equation analysis of intensive longitudinal data. *Structural Equation Modeling: A Multidisciplinary Journal*, *25*(3), 359–388.
5. Asparouhov, T., & Muthén, B. (2022). Technical report: One-step versus two-step DSEM. *Mplus Technical Papers*.
6. Bolger, N., & Laurenceau, J.-P. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research*. Guilford Press.
7. Borsboom, D., Deserno, M. K., Rhemtulla, M., Epskamp, S., Fried, E. I., Waldorp, L. J., Jayigiri, B. K., Mansueto, A. C., Haslbeck, J. M. B., van Bork, R., Blanken, T. F., Reiger, U. K., Pannekoek, N., & van der Maas, H. L. J. (2021). Network analysis: An integrative approach to the structure of psychopathology. *Annual Review of Clinical Psychology*, *17*, 79–121.
8. Cheng, P., Liu, Y., Sun, X., Zhang, Q., Guo, J., Hu, X., & Long, Q. (2024). A systematic review of studies using network analysis to assess dynamics of psychotic-like experiences in community samples. *Psychological Medicine*.
9. Fang, J. (2025). Moderated mediation analyses of intensive longitudinal data. *Acta Psychologica Sinica*, *57*(5), 915–928.
10. Gelman, A., Carlin, J. B., Stern, H. S., Dunson, D. B., Vehtari, A., & Rubin, D. B. (2013). *Bayesian data analysis* (3rd ed.). CRC Press.
11. Glenn, A. (2026, May 10). Brain scans reveal a shocking difference between psychopaths and other people. *ScienceDaily*.
12. Golino, H. F., & Epskamp, S. (2017). Exploratory graph analysis: A new approach for estimating the number of dimensions in psychological research. *PLOS ONE*, *12*(6), e0174039.
13. Golino, H., Christensen, A. P., Moulder, R. G., Kim, S., & Boker, S. M. (2020). Modeling the dynamics of psychological networks: The exploratory graph analysis approach. *Psychological Methods*, *25*(3), 292–312.

14. Hamaker, E. L., Asparouhov, T., Brose, A., Schmiedek, F., & Muthén, B. (2018). At the frontiers of modeling intensive longitudinal data: Dynamic structural equation modeling for the within-person process. *Multivariate Behavioral Research*, 53(6), 826–841.
15. Hamaker, E. L., & Wichers, M. (2017). No time like the present: Discovering the hidden dynamics of psychopathology using the experience sampling method. *Current Directions in Psychological Science*, 26(1), 10–15.
16. Hasan, M. J., Shifat, S. H., Matubber, J. J., Hossain, R. R., Rahman, M. M. A., Haque, B. B. M. T., & Hossen, M. J. (2025). An in-depth exploration of machine learning methods for mental health risk detection using multimodal digital traces. *Frontiers in Digital Health*.
17. Heron, K. E., & Smyth, J. M. (2010). Ecological momentary intervention: Incorporating mobile technology into psychosocial and health behavior treatments. *British Journal of Health Psychology*, 15(1), 1–39.
18. McNeish, D. (2016). Using Bayesian priors to save small sample multilevel models from maximum likelihood's poor performance. *Methodology*, 12(3), 113–126.
19. McNeish, D., & Hamaker, E. L. (2020). A primer on dynamic structural equation modeling. *Multivariate Behavioral Research*, 55(4), 573–595.
20. Nosek, B. A., Spies, J. R., & Motyl, M. (2012). Scientific utopia: II. Restructuring incentives and practices to promote truth over publishability. *Perspectives on Psychological Science*, 7(6), 615–631.
21. Pauer, S. (2026, May 5). Researcher in focus: Shiva Pauer and his team on the temporal dynamics of human decision-making. *ExpiWell*.
22. Priya, A., Garg, S., & Tigga, N. P. (2020). Predicting anxiety, depression and stress in modern life using machine learning algorithms. *Procedia Computer Science*, 167, 1258–1267.
23. Prosser, H., et al. (2022). Ethical questions about open data requirements in qualitative research. *The Psychologist*.
24. Qasrawi, R., Vicari, S., Al-Dabbagh, S., Amro, A., & Abu-Ghazaleh, H. (2022). Predicting anxiety among Palestinian students using machine learning algorithms. *Frontiers in Psychology*, 13, 931758.
25. Sajja, G. S. (2021). Predicting anxiety levels of university students using machine learning techniques. *Journal of Engineering and Applied Sciences*.
26. Schwartz, B., Barkham, M., & Beierl, E. T. (2021). Implementing precision methods in personalizing psychological therapies: Barriers and possible ways forward. *Behaviour Research and Therapy*, 172, 104443.

27. Serre, F., Fatseas, M., Swendsen, J., & Auriacombe, M. (2015). Ecological momentary assessment in the investigation of craving and substance use in daily life: A systematic review. *Drug and Alcohol Dependence*, 148, 1–20.
28. Sewall, C. J. R., & Parry, D. A. (2024). The adolescent mental health crisis: Moving beyond simple screen time narratives. *ABCD Study Insights*.
29. Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, 4, 1–32.
30. Simonsohn, U., Simmons, J., & Nelson, L. D. (2020). Specification curve analysis. *Nature Human Behaviour*, 4(11), 1208–1214.
31. Stone, A. A., & Shiffman, S. (1994). Ecological momentary assessment (EMA) in behavioral medicine. *Annals of Behavioral Medicine*, 16(3), 199–202.
32. Syed, M. (2025). Opening the door to open science. *University of Minnesota Strategic Plan Initiatives*.
33. Tay, L. (2026, January 5). Experience sampling method (ESM) vs ecological momentary assessment (EMA): What are the differences? *ExpiWell*.
34. Trull, T. J., & Ebner-Priemer, U. (2013). Ambulatory assessment. *Annual Review of Clinical Psychology*, 9, 151–176.
35. van Dijk, W., Schatschneider, C., & Hart, S. A. (2021). Open science in education sciences. *Journal of Learning Disabilities*, 54(2), 139–152.
36. Vazire, S. (2018). Implications of the credibility revolution for productivity, creativity, and progress. *Perspectives on Psychological Science*, 13(4), 411–417.
37. Wagenmakers, E. J., Lodewyckx, T., Kuriyal, H., & Grasman, R. (2008). Bayesian hypothesis testing for psychologists: A tutorial on the Savage-Dickey density ratio. *Cognitive Psychology*, 56(2), 131–174.
38. Wenze, S. J., Miller, I. W., & Alpert, J. E. (2009). The everyday experience of bipolar disorder: An ecological momentary assessment study. *Journal of Affective Disorders*, 114(1-3), 254–260.
39. Wongvorachan, T., & Bulut, O. (2024). The advanced applications of psychological networks with exploratory graph analysis. *Learning Analytics Methods*.
40. Zhang, Z., et al. (2024). Associations among psychological resilience, Big Five personality traits, and depression–anxiety–stress symptoms in undergraduate cadets: A network analysis. *Journal of Psychiatric Research*.

