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Invited Editorial

A Non-Parametric Approach to Reducing Statistical Noise in Idiographic Measurement

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The measurement of clinical outcomes through standardised and/or idiographic outcome measures is a well-established recommendation within clinical psychology (e.g., Bornstein, 2017; Hawton et al., 1989; Kennerley et al., 2016; Thomas, 2019). The growing attention of clinical psychology to an increasingly broad range of conditions, including medical and physical conditions, requires robust methodological approaches capable of addressing their diverse and progressively changing phenomenological manifestations (Dalglish et al., 2020; Davey, 2021; Di Giuseppe & Conversano, 2022; Guarino et al., 2025; Martino et al., 2026; Rozensky, 2006). Measurement of outcomes in clinical practice is indispensable for establishing the efficacy of psychological interventions (Lindheim et al., 2020; Merlo, 2025; Merlo & Myles, 2024; Murphy et al., 2024). Idiographic measurement facilitates feedback-informed interventions and supports clinicians to establish baseline functioning, monitor progress and detect deterioration/stagnation (Frumkin et al., 2021; Levinson et al., 2025; Morley, 2017; Piccirillo & Rodebaugh, 2019). Without quantitative data, clinicians are left relying on subjective impressions of distress, which may obscure the true trajectory of a client's progress or fail to indicate when a specific therapeutic strategy is ineffective.

Modern approaches to psychological therapy are increasingly advocating the use of single-case experimental design (SCED) methodology to evaluate client progress and outcomes. Whilst variable in nature, SCEDs typically involve the repeated measurement of a target variable (e.g., anxiety) over time, often across distinct phases, such as a baseline period followed by an intervention phase (Aydin, 2024; Krasny-Pacini & Evans, 2018; Kazdin, 2019; Machalicek et al., 2024; Morley, 2017; Smith, 2012; Yang et al., 2023).

However, discerning a clear treatment effect is often complicated by the presence of statistical noise. Noise refers to random, theoretically irrelevant variability in measurements that obscure 'true' scores (Cundao, 2025; Gell et al., 2024; Kahneman et al., 2021; Sundh et al., 2025). Whilst accurate measurement depends on the minimisation of noise, it is not uncommon to find significant noise in either baseline or intervention data, which obscures the 'true' signal of the client's distress. High levels of noise within a patient's self-reporting can render data erratic, making it difficult for clinicians to determine whether their interventions are genuinely effective or if observed fluctuations are merely artifacts of measurement instability (Kahneman et al., 2021).

One avenue for mitigating this issue is the adoption of non-parametric approaches to clinical measurement. For instance, Kahneman and colleagues (2021) highlight that, whilst absolute ratings are prone to significant noise, comparative rankings tend to be more reliable. Such approaches can be leveraged with clinical data to reduce noise by shifting the measurement focus from absolute intensity, a common approach to developing idiographic measures (e.g., Evans et al., 2023; Myles & Jones, 2024; Myles, 2025; Sales et al., 2023; Wright & Zimmermann, 2019), to relative prominence.

An idiographic non-parametric approach to clinical assessment may be operationalised through the repeated ordinal ranking of affective states according to their relative prominence. For example, clinically relevant positive and negative affective states may be identified at baseline and subsequently rank ordered at repeated assessment points. Therapeutic change would therefore be represented by systematic changes in the ordinal configuration of these states over time. A transition from a hierarchy dominated by negative affective states, such as low mood, anxiety, and fear, to one in which positive states, such as contentment, happiness, and joy, occupy higher ranks would constitute evidence of change at the level of the individual's affective profile. Importantly, such an approach does not require assumptions regarding the magnitude or equal spacing of differences between successive observations, as interpretation is based on changes in relative ordering rather than absolute numerical scores.

The potential methodological advantage of this approach concerns the distinction between absolute and comparative judgements. Conventional numerical rating scales require individuals to map subjective internal states onto externally defined numerical anchors. Such judgements may be affected by contextual and occasion-specific sources of variability, including transient mood states, fatigue, and concurrent stressors, thereby contributing to measurement noise (Kahneman et al., 2021). Ordinal assessment instead requires discrimination among concurrently evaluated states according to their relative prominence. From a measurement perspective, this reduces reliance on the correspondence between an internal subjective state and an externally imposed numerical metric and shifts the assessment task towards within-person comparison.

Whether this comparative process produces greater temporal stability or lower measurement error than absolute ratings remains an empirical question. However, it can be hypothesised that common occasion-specific influences affecting multiple affective states may exert a smaller effect on their relative ordering than on their absolute numerical ratings. Under such conditions, ordinal rankings could preserve clinically meaningful information regarding the organisation and relative prominence of affective experiences while attenuating variability attributable to the numerical scaling process itself. This proposition provides a testable methodological rationale for investigating rank-based idiographic measures as an alternative or complement to conventional absolute rating procedures in repeated clinical assessment.

To conclude, whilst the measurement of therapeutic outcomes is a cornerstone of evidence-based practice, the utility of repeated clinical assessment may be compromised by statistical noise. Non-parametric, rank-based approaches to idiographic measurement provide a potential alternative or complement to conventional absolute rating procedures by shifting the assessment focus from absolute intensity to the relative prominence of clinically relevant states. However, whether this approach reduces occasion-specific variability and improves measurement stability remains to be established empirically. Future research should therefore directly compare absolute and rank-based measurement procedures to determine whether the proposed methodological advantages translate into more reliable detection of therapeutic change.

Conflict of Interest Statement

The author declares that the research was conducted in the absence of any potential conflict of interest.

AI Disclosure Statement

The author declares that no artificial intelligence (AI) tools, including generative AI systems, were used in the conception, design, drafting, or writing of this manuscript. All intellectual content, scientific reasoning, and manuscript preparation were carried out solely by the author.

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