

Statistical Centrality is Not a Clinical Priority: Case Formulation for Cognitive Behavioral Therapy

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Dear Editor,

A network analysis of psychopathology has become an influential approach for making the relationships among symptoms more visible. Rather than treating psychiatric symptoms as passive indicators of an underlying disorder, this approach conceptualizes them as elements that may influence, activate, and maintain one another over time (Briganti et al., 2024). In this respect, network models offer a productive conceptual framework for cognitive behavioral therapy (CBT) research. CBT also seeks to understand clinical problems through reciprocal patterns among thoughts, emotions, physiological responses, and behaviors, not through isolated symptoms alone. Therefore, network analysis may generate useful hypotheses about comorbidity, symptom spread, and possible maintenance cycles (Jones et al., 2021). However, an important translational gap remains. Although the limits of centrality metrics are well recognized, their proper role in CBT planning is less clearly defined. We argue that network findings should guide formulation questions rather than determine treatment priorities.

Nevertheless, caution is needed while translating centrality and bridge centrality findings into clinical practice. A central symptom may have many or strong connections; however, this does not establish causal priority or identify the best initial treatment target. Cross-sectional and group-level networks do not directly show the direction of change or the likely effect of intervention (Spiller et al., 2020). Although bridge centrality may clarify the patterns of comorbidity, it cannot specify which symptom should be addressed first, for which patient, or through which intervention (Jones et al., 2021). The key risk is a premature movement from a statistically central node to the clinical priority of an individual patient.

CBT therapeutic decision-making relies on a different form of reasoning. Treatment targets are not determined solely by symptom severity or by the position of a symptom within a statistical model. They are identified through case formulation and functional analysis. Clinicians examine thoughts, beliefs, avoidance, safety behaviors, emotional regulation strategies, and cycles of short-term relief and long-term maintenance (Salkovskis et al., 2023; Spencer et al., 2023). This is consistent with process-based approaches, focusing on modifiable mechanisms and their context rather than diagnostic labels or symptom categories (Hofmann & Hayes, 2019; Ong et al., 2022). Avoidance, threat appraisal, rumination, and reinforcement loss processes may operate across diagnoses. Their function and modifiability must still be established for each patient. A central node is clinically useful only when it points to a plausible maintenance process that can be tested.

This distinction has direct clinical relevance. Anhedonia is assumed to be the most central node in the two patients. Withdrawal from rewarding activities reduces not only anticipated effort but also positive reinforcement in the first patient. Therefore, graded behavioral activation may be the initial priority. Anhedonia in the second patient follows threat-driven social avoidance and



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safety behaviors after humiliating experiences. Exposure, behavioral experiments, and work on threat appraisals may take precedence. The maintenance process and treatment sequence differ although the statistical node is the same. A less central node may also deserve earlier attention when it is more modifiable, functionally upstream, safety-relevant, or necessary for treatment engagement.

This caution does not diminish the value of network analysis. Network models can visualize interactions that total scores conceal, generate hypotheses about bridge processes and comorbidity, guide focused assessment, and support repeated monitoring during treatment. Person-specific or collaboratively constructed networks also support shared formulation and make clinical assumptions more explicit (Hall et al., 2024; Seewald et al., 2025). These functions are complementary to formulation. The network organizes observations, and formulation determines their functional meaning and therapeutic relevance.

Accordingly, a central or bridge node should prompt focused clinical questions. When does it increase? Which thoughts accompany it? Which behaviors does it trigger? What short-term reduction does it reduce, and what does it maintain over time? These questions connect statistical structure with the lived context of the patient. Then, behavioral experiments, exposure and new-learning procedures, skill generalization, and systematic monitoring can test network-informed hypotheses within the individual case (Hall et al., 2024; Ong et al., 2022).

This problem of clinical translation may be reduced in future research by moving beyond cross-sectional and group-level networks. Studies should also move beyond symptom-only or diagnosis-bound nodes. Dynamic and temporal models, ecological momentary assessment, idiographic networks, single-case experiments, and therapy-process data can show when and for whom a process becomes influential. They can also test whether change in that process precedes, mediates, or produces clinical improvement (Briganti et al., 2024; Frumkin et al., 2021; Mansueto et al., 2023). Although personalized network-informed treatment strategies are promising, process centrality should not be inferred from connectivity alone. It requires within-person temporal evidence and, ideally, intervention-based confirmation.

In conclusion, network analyses are valuable and hypothesis-generating tools for CBT research and can support focused assessment and treatment monitoring. Network analysis should inform what clinicians assess, monitor, and test. Individualized case formulation should determine what to target, why it matters to the patient, and in what sequence. Statistical centrality can enrich clinical reasoning; however, it should not dictate treatment priority.

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