

Bridging the Gap Between Mindfulness and Executive Functioning: Conceptual Tension and Research Opportunities – A PRISMA Systematic Review

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Abstract

The construct of mindfulness has gained significant prominence in psychological and neuroscientific research; however, its definition remains inconsistent across academic literature. This systematic review, guided by the PRISMA methodology, aimed to examine how mindfulness is currently conceptualized in relation to executive functions (EFs). A purposive search of Google Scholar identified 36 eligible studies published between 2019 and 2024 that provided explicit definitions or conceptual frameworks for mindfulness. Through qualitative content analysis, nine distinct EF categories were used to code 102 extracted definitions. The most frequently represented functions were attention regulation, self-monitoring, and emotional and behavioral self-regulation, suggesting that mindfulness is primarily defined as a metacognitive capacity for present-moment awareness and adaptive control. Less commonly referenced functions included planning, organization, and working memory. A co-occurrence analysis revealed dominant EF clusters, while a temporal analysis showed increasing complexity in definitions over time. Notably, the study identifies a conceptual gap between the definitional emphasis on attentional and affective regulation and empirical findings that highlight higher-order cognitive mechanisms such as psychological flexibility and inhibitory control. These findings underscore the need to integrate executive and neurocognitive processes into future theoretical models of mindfulness to enhance conceptual clarity, improve measurement, and inform intervention design.

Keywords: mindfulness, executive functions, systematic review, attention, self-regulation, conceptualization, PRISMA

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Introduction

Over the past few decades, the concept of mindfulness has become a prominent focus of psychological and neurocognitive research. Despite its growing popularity in therapy, education, and personal development, substantial variability in its definition persists in the academic literature (Baer, 2003; Brown & Ryan, 2003). Theoretical frameworks for defining mindfulness remain inconsistent, and numerous scientific studies attempt to capture and operationalize the construct across various contexts, resulting in divergent understandings. This definitional inconsistency presents a fundamental barrier to developing a comprehensive and unified theoretical framework that would enable consistent operationalization in research, support effective application in practice, and ensure the scientific validity of the construct (Chiesa, 2013; Van Dam et al., 2018).

In academic literature, mindfulness has been conceptualized in various ways – as a specific state of attention, as a meditative practice (Kabat-Zinn, 1990), or as a cognitive set of regulatory processes (Zelazo & Lyons, 2012). However, this conceptual heterogeneity complicates the advancement of interdisciplinary research and the application of mindfulness in psychology, education, and clinical practice (Phan-Le et al., 2022; Wang et al., 2021). With the increasing integration of mindfulness into various domains, there is a growing need for a clear, systematic, and methodologically grounded understanding of the construct (Chiesa, 2013).

Although several studies have demonstrated the beneficial effects of mindfulness on cognitive and emotional functions, there is no systematic review that explicitly examines the relationship between mindfulness and executive functioning (EF) processes – or executive functions such as attentional regulation, inhibitory control, working memory, and cognitive flexibility (Jankowski & Holas, 2014; Luu & Hall, 2017). Executive functioning is not a unitary construct. Earlier research has suggested that executive functioning comprises a group of interrelated yet autonomous processes (e.g., Denckla, 1996; Fuster, 2008). Evidence for such a modular architecture of executive functions has been provided by neuropsychological studies of the frontal lobes, which are known to mediate these functions. Several models have been proposed to describe the structure and conceptual framework of executive functioning. Beyond certain conceptual and theoretical differences, these models primarily differ in which specific executive function is considered fundamental and organizing – whether it be inhibition or self-regulation (Barkley, 1997), the attentional control system (Norman & Shallice, 1986), working memory (Baddeley, 1996, 2002), planning (Zelazo et al., 1996), or the construct of cognitive flexibility (Anderson, 2002). Given these considerations, in this paper the terms executive functioning processes and executive functions are used interchangeably, with no semantic shift intended.

Executive functions are typically defined as higher-order cognitive processes that enable goal-directed behavior, including sustained attention, self-monitoring,

and emotional and behavioral self-regulation (Anderson, 2002; Barkley, 2011; Goldstein & Naglieri, 2013). These functions form the foundation for self-control, cognitive flexibility, and adaptive decision-making, all of which are frequently attributed to mindfulness practice.

Recent meta-analyses have consistently demonstrated that mindfulness-based interventions enhance several domains of executive functioning, particularly working memory, inhibitory control, and cognitive flexibility (Cásedas et al., 2020; Whitfield et al., 2022). These findings support the view that mindfulness practice engages top-down regulatory mechanisms that improve attentional stability and adaptive self-control. Despite these empirical advances, conceptual clarity about which executive processes are inherently represented within definitions of mindfulness remains limited.

Moreover, existing definitions of mindfulness vary widely in how they incorporate these functions. While some definitions emphasize attention and awareness, others include emotional regulation or metacognitive monitoring. To date, no systematic review has mapped how definitions of mindfulness explicitly refer to executive functions. Therefore, the aim of the present study is to analyze existing definitions of mindfulness, identify their links to executive functions, and contribute to the standardization of the concept of mindfulness within psychological research. To achieve this, the study employs the PRISMA methodology (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which ensures transparency and reproducibility in systematic review procedures (Page et al., 2021).

Method

The PRISMA protocol provides comprehensive guidelines for identifying, selecting, analyzing, and reporting relevant studies, ensuring transparency, reproducibility, and methodological rigor (Page et al., 2021). The review was guided by the research question: Which components of executive functioning are most frequently employed in contemporary scientific literature to conceptualize or define mindfulness? To ensure conceptual clarity, the TIO model (Topic–Interest–Outcome) was used to structure the research aim, following recommendations for transparent question formulation in systematic reviews (Booth et al., 2016; Richardson et al., 1995). Specifically, the Topic referred to definitions of mindfulness in psychological and neuroscientific studies, the Interest to executive functions used in these definitions, and the Outcome to the categorization of definitions according to their executive components. Studies were eligible for inclusion if they (a) explicitly addressed the definition or conceptualization of mindfulness in the context of executive or cognitive functions, and (b) were published between 2019 and 2024 in peer-reviewed journals. In addition to primary empirical studies, we included systematic reviews that explicitly stated definitions of

mindfulness related to executive functioning. Reviews were included because they often consolidate and formalize conceptual definitions that are otherwise scattered across individual studies, providing higher-level theoretical clarity. Exclusion criteria included studies focusing exclusively on the effects of mindfulness on mental health without conceptual discussion, as well as doctoral dissertations or unpublished works. These sources were excluded because the review focused on peer-reviewed publications that explicitly define or conceptualize mindfulness within the framework of executive functioning. Limiting the analysis to peer-reviewed studies ensured conceptual and methodological rigor and reduced the inclusion of studies lacking transparent quality assessment, while acknowledging that this choice may limit the scope of the findings. The five-year inclusion window was chosen to ensure that the review reflects the most recent conceptual developments in mindfulness and executive functioning research.

Search Strategy and Procedure

A systematic literature search was conducted in Google Scholar, chosen for its broad indexing of both psychological and neuroscientific journals. The search was performed in February 2024 using the following key phrases: “mindfulness definition,” “mindfulness conceptualisation,” “mindfulness model,” and “mindfulness framework.” Boolean operators were used to combine keywords, and reference lists of included studies were manually screened for additional relevant sources. Although the inclusion criteria limited the search to studies published from 2019 onward, one article originally dated 2018 was retained in the analysis. This decision was made because the study had an online publication date in early 2019, which caused it to appear in the Google Scholar filter for that year. Given its conceptual relevance and contribution to the theoretical understanding of mindfulness, the study was included despite the nominal discrepancy in publication year. The database search yielded a total of 2,828 records. All retrieved records were imported into Zotero reference management software (Corporation for Digital Scholarship, n.d.) for organization and deduplication. After automatically excluding clearly irrelevant sources and removing duplicates, 118 records remained for manual screening by two reviewers in consensus. Abstracts and full texts were assessed for eligibility based on the predefined inclusion and exclusion criteria. Any potential discrepancies were to be resolved through discussion and, if necessary, by a third reviewer. However, all screening decisions were reached by consensus, and no disagreements occurred. Following this process, 44 studies met the inclusion criteria and underwent detailed quality appraisal. From each study, the following data were extracted: authors and year of publication, definition of mindfulness, theoretical framework or model of mindfulness, executive functions associated with the definition, study type (systematic review or empirical study), and key conclusions linking mindfulness to executive functions. Data extraction was independently

verified by both reviewers to ensure consistency. The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Systematic Reviews, in accordance with the JBI Manual for Evidence Synthesis (Aromataris & Munn, 2020). Each review was rated on a scale from 0 to 10, with scores ≥ 7 considered high quality. For original empirical studies, methodological quality was assessed using the Newcastle–Ottawa Scale (NOS; Wells et al., 2011). The NOS was applied in an adapted form suitable for conceptual and theoretical analyses, evaluating three domains: (1) selection and representativeness of the study sample, (2) comparability of study groups or research conditions, and (3) adequacy of outcome assessment and reporting. Studies scoring ≤ 3 were excluded from the final synthesis. Finally, 36 studies satisfied all inclusion and quality criteria and were included in the final synthesis.

Following quality appraisal, the included studies underwent qualitative content analysis to identify conceptual patterns in how mindfulness definitions relate to executive functions. The analytical procedure is described in detail in the following section. The narrative synthesis is presented in the Results (see “Clusters of Definitions Based on Executive Functions” and “Co-Occurrence of Executive Functions”).

Coding Framework

A qualitative content analysis was employed to identify and categorize executive aspects embedded in definitions of mindfulness. This approach was chosen because it allows for systematic interpretation of textual data through coding and categorization (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005; Schreier, 2012). Based on the research question, a preliminary coding framework was developed, incorporating codes aligned with various executive functions (Mayring, 2014). We used a primarily deductive coding framework consisting of nine EF categories derived from established executive function literature (e.g., Anderson, 2002; Barkley, 2011; Goldstein & Naglieri, 2013). In parallel, open coding was applied to capture non-EF or emergent conceptual elements, such as philosophical or non-executive definitions of mindfulness.

A pilot coding of approximately 20% of the dataset was conducted to refine the codebook, clarify inclusion and exclusion criteria, and provide illustrative examples for each category. The primary analysis reports frequencies and co-occurrences for the nine EF categories, while emergent non-EF codes are described narratively in the Results section.

Drawing on a review of relevant literature, we constructed a preliminary coding scheme consisting of nine distinct categories of executive functioning: (1) planning and goal setting, (2) organization and strategy maintenance, (3) working memory, (4) cognitive flexibility, (5) inhibition and impulse control, (6) sustained attention,

(7) self-monitoring and performance regulation, (8) emotional and behavioral self-regulation, and (9) problem solving and decision making.

Detailed conceptual definitions of each category, together with key references, are provided in Appendix A.

Coding Procedure and Thematic Analysis

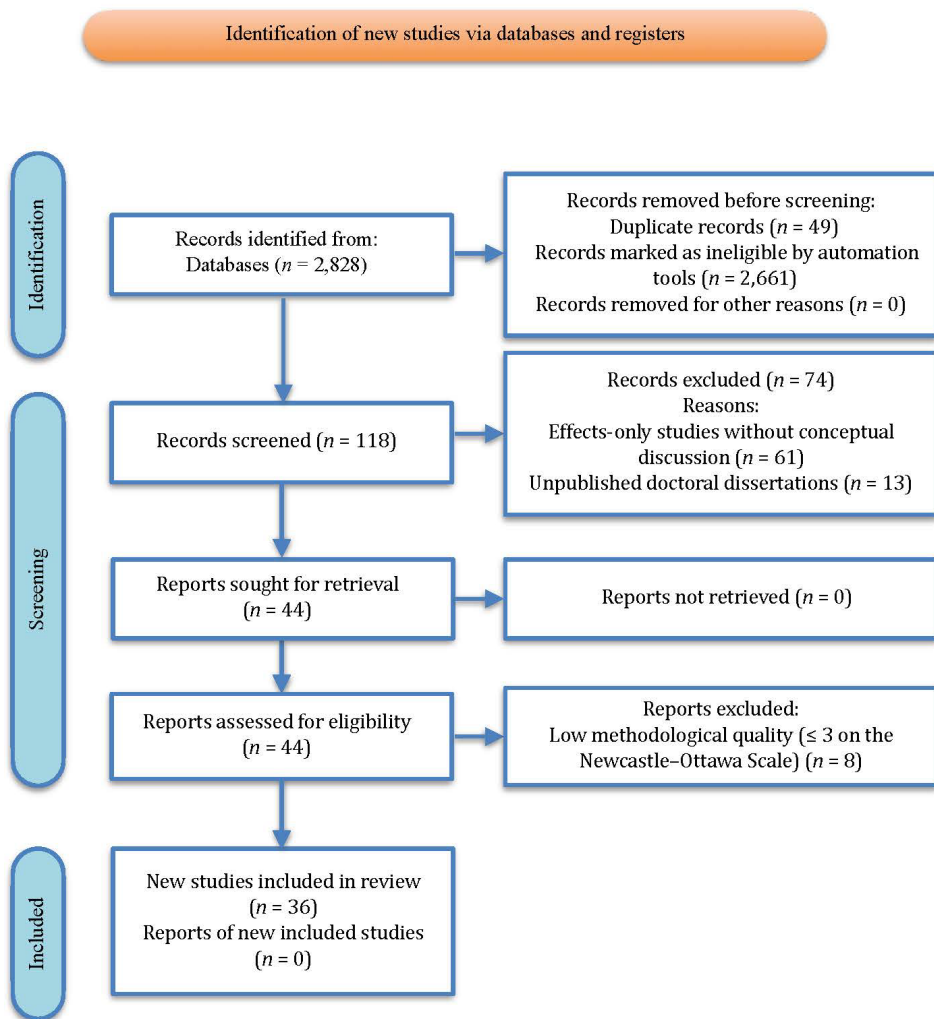
The identification of the aforementioned codes was based on established theoretical frameworks of executive functions (Anderson, 2002; Goldstein & Naglieri, 2013). While certain concepts may overlap, distinguishing them in this study allowed for a more precise examination of their roles in the mechanisms underlying mindfulness. Following the selection of studies, abstracts and full texts were carefully reviewed. Relevant excerpts were identified and assigned to specific codes. An open coding approach was employed, meaning the codes were not predetermined but developed iteratively during the analysis process. When new, previously unrecognized concepts emerged, additional codes were created. After the initial coding phase, individual codes were grouped into broader thematic categories aimed at identifying major themes and patterns in the definitions of mindfulness. Based on these categories, the analysis examined which executive functions most frequently appeared in mindfulness definitions, how these functions were associated with different mindfulness contexts (e.g., in therapeutic settings or neuroscientific research), and which theoretical frameworks supported these conceptualizations. To ensure the reliability of the analysis, two reviewers collaboratively screened and coded the studies. All decisions were reached by consensus, and no discrepancies occurred during the coding process. This collaborative approach ensured the reliability of coding and strengthened the overall validity of the findings. To identify combinations of executive functions present in mindfulness definitions, a binary presence/absence matrix (1/0) was created for each of the nine EF categories at the level of individual definitions. Subsequently, in Microsoft Excel, a co-occurrence matrix was computed for every pair of executive functions using the function = SUMPRODUCT((Column1=1)*(Column2=1)). The result was a symmetrical 9×9 matrix, with each cell representing the frequency of co-occurrence between two executive functions.

The results of the analysis are presented in a narrative format, highlighting the main findings on how mindfulness is defined and how these definitions relate to specific executive functions. In line with PRISMA recommendations, we employed a narrative synthesis to describe and interpret thematic patterns in the definitions (e.g., clusters of executive functions, their co-occurrence, and representative examples) (Popay et al., 2006).

A graphical representation of the study selection process is provided in Figure 1.

Figure 1

PRISMA Flowchart



Results

Within the analyzed set of definitions, we identified varying degrees of representation across the nine executive functions (EFs). From the 36 included studies, we extracted 102 unique definitional statements of mindfulness. The following section presents a narrative synthesis of the findings, integrating frequency data, clustering patterns, and temporal trends in the representation of executive

functions across mindfulness definitions. The most frequently coded EF was “Attention and Sustained Focus”, which appeared in more than half of the definitions ($n = 66$). This dominance reflects the prevailing conceptualization of mindfulness as a cognitive capacity for focusing on the present moment.

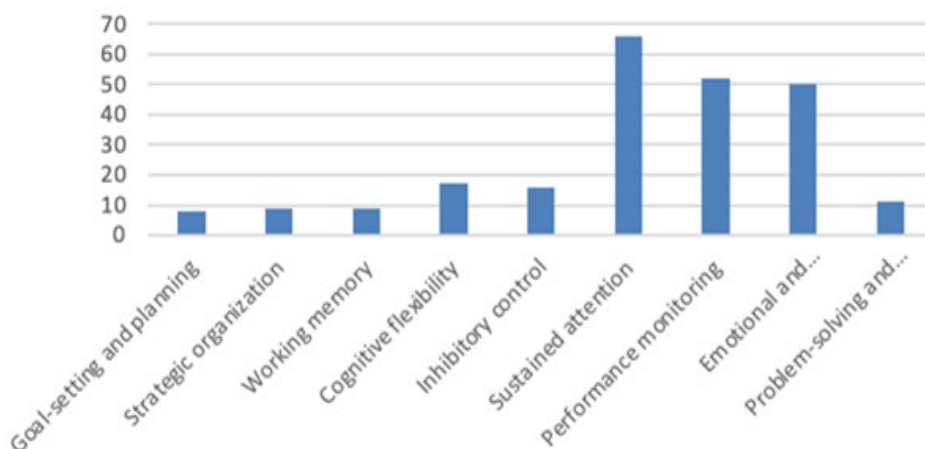
The second and third most commonly coded EFs were “Self-Monitoring and Performance Regulation” ($n = 53$), and “Emotional and Behavioral Self-Regulation” ($n = 48$). These two functions underscore the view of mindfulness as a metacognitive process involving conscious monitoring of one’s mental states and regulation of emotional or behavioral responses.

In contrast, lower frequencies were observed for “Planning and Goal Setting” ($n = 6$), “Organization and Strategy Maintenance” ($n = 5$), and “Working Memory” ($n = 6$). These functions represent higher-order cognitive abilities, which are less frequently and less explicitly conceptualized in the current mindfulness literature.

A visualization of the frequency distribution (Figure 2) illustrates that the majority of mindfulness definitions focus on selective attention and self-regulation, whereas functions associated with planning, decision-making, or working memory remain peripheral to the conceptual framework.

Figure 2

Frequency of Executive Functions in Definitions of Mindfulness



In summary, the frequency distribution highlights that mindfulness is primarily defined by attentional and regulatory processes, while higher-order executive functions remain marginal within its conceptual landscape.

Clusters of Definitions Based on Executive Functions

Below we present a narrative synthesis of definitional patterns, highlighting dominant clusters, frequent co-occurrences, and illustrative examples of how executive functions are embedded in mindfulness definitions. This narrative synthesis aims to contextualize the frequency data by providing thematic groupings and representative examples. Using the nine EF categories, the analysis identified 42 unique clusters of definitions. Of these, four clusters were most frequent, together representing 52 of the 102 analyzed definitions.

The first and most prominent cluster ($n = 23$) included definitions combining sustained attention, self-monitoring and performance regulation, and emotional and behavioral self-regulation. These conceptualizations describe mindfulness as the ability to sustain focused attention while simultaneously observing one's internal states and regulating emotional and behavioral responses. A representative example is provided by Rogge and Daks (2021), who described mindfulness as a multistage process involving: (1) mindful lenses (observing, describing, acting with awareness), (2) mindful responses to difficulty (acceptance, defusion, self-as-context), and (3) value-aligned action.

The second most frequent cluster ($n = 13$) emphasized sustained attention combined with emotional and behavioral self-regulation. These definitions portray mindfulness as the capacity to maintain awareness of ongoing experience while regulating emotional and behavioral reactions to it. For instance, Schuman-Olivier et al. (2020, p. 372) defined mindfulness as “the practice of paying attention to present-moment experience with an orientation of curiosity, openness, acceptance, nonreactivity, and nonjudgment.”

A third cluster ($n = 11$) included definitions that approached mindfulness as a philosophical or ethical stance rather than a cognitive mechanism. These accounts framed mindfulness as an existential or moral orientation toward life, focusing on compassion, maturity, and acceptance of suffering. For example, Errasti-Pérez (2022, p. 241) described mindfulness as “a compassionate, restrained, calm, mature attitude from which one deals with the inevitable suffering in life.”

Finally, a smaller cluster ($n = 5$) focused exclusively on sustained attention, presenting mindfulness as a purely attentional capacity devoid of metacognitive or regulatory components. This attentional perspective was also reflected in earlier accounts cited in the included literature. For example, Alvear (2022, p. 1545) referenced Bhikkhu Bodhi's (1993) definition of mindfulness as “the mental ability to pay attention to physical or mental events that occur in the present moment.”

The remaining 38 clusters contained one to four definitions each, often involving less common combinations of executive functions such as inhibition, flexibility, working memory, or decision-making. Collectively, these findings indicate that mindfulness is most frequently conceptualized as an interaction between

attention, monitoring, and emotional regulation, supporting its interpretation as a self-regulatory process rather than a strategic cognitive operation.

Quantitative analysis of EF co-occurrence confirmed these qualitative patterns. The most frequent pairings were sustained attention with emotional and behavioral self-regulation ($n = 38$), sustained attention with self-monitoring and performance regulation ($n = 36$), and emotional and behavioral self-regulation with self-monitoring ($n = 34$). These findings reinforce the interpretation of mindfulness as a combination of present-moment focus, metacognitive monitoring, and emotional regulation. In contrast, higher-order executive functions – such as working memory ($n = 5$) or planning and cognitive flexibility ($n = 3$) – appeared only rarely, suggesting they play a marginal role in mainstream conceptualizations. A sensitivity analysis excluding review articles yielded the same top three EF categories – attention, self-monitoring, and emotional/behavioral regulation – with only minor changes in the ranking of low-frequency categories, indicating that the observed patterns were robust.

Temporal Trends in EF Representation

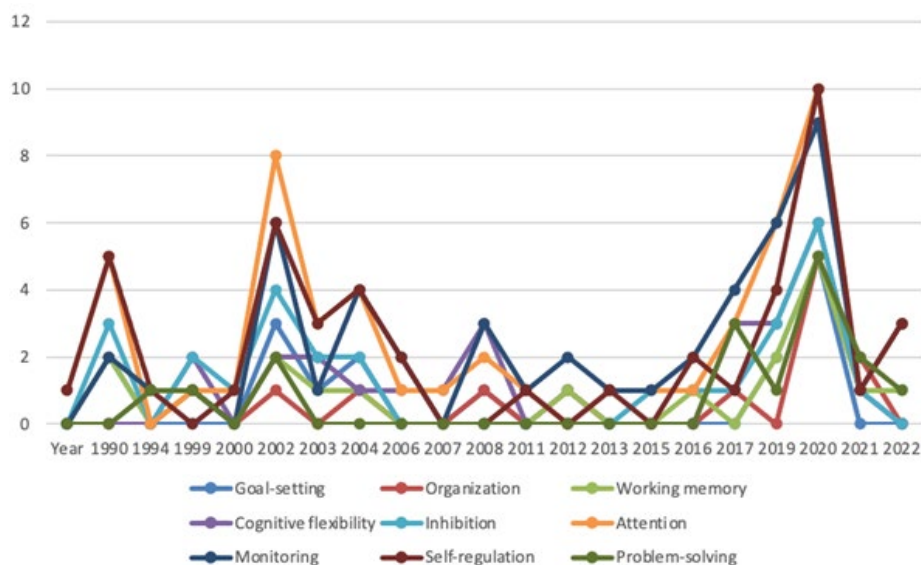
This supplementary trend analysis was based on the publication years of the original mindfulness definitions cited in the reviewed studies, rather than the publication years of the studies themselves. Therefore, it serves as a contextual overview that extends beyond the primary 2019–2024 inclusion window. An analysis of EF representation over time (Figure 3) revealed several trends. The y-axis represents the number of definitions in which each executive function appeared in a given publication year, indicating the relative frequency of EF references over time. “Sustained Attention” has remained the dominant component of mindfulness definitions, with notable peaks in 2003, 2010, and 2021. “Self-Monitoring” and “Emotional and Behavioral Self-Regulation” began increasing in frequency after 2010, approaching the frequency of attention by 2020. This reflects a theoretical evolution toward metacognitive and regulatory models of mindfulness (e.g., Malinowski, 2013; Shapiro et al., 2006). Higher-order functions such as “Planning,” “Organization,” or “Decision-Making” remained infrequent, with no clear temporal growth.

Overall, the post-2020 increase in all EF types may partially reflect the growth in mindfulness literature following the COVID-19 pandemic and the growing interest in psychological well-being.

Taken together, these temporal patterns indicate a gradual theoretical shift from early attention-focused conceptualizations toward more integrative models emphasizing self-monitoring and emotional and behavioral self-regulation as core components of mindfulness.

Figure 3

Temporal Trends in the Occurrence of Executive Functions in Definitions of Mindfulness



Discussion

This systematic review examined how mindfulness has been defined in contemporary academic literature, focusing on its conceptual connection to executive functions (EFs). The results revealed that mindfulness is most frequently defined in terms of sustained attention, self-monitoring, and emotional and behavioral regulation. In contrast, higher-order EFs such as planning, strategic organization, and problem-solving were rarely referenced.

Conceptual Trends in Mindfulness Definitions

The clustering analysis confirmed the presence of dominant EF configurations in definitional patterns. The most frequent combinations included sustained attention, self-monitoring and performance regulation, and emotional and behavioral self-regulation, indicating a strong emphasis on moment-to-moment regulation. Temporal analysis showed a shift toward more complex metacognitive and regulatory models of mindfulness, particularly after 2010. This trend is consistent with evolving theoretical frameworks, such as the Self-Awareness, Self-Regulation, and Self-Transcendence (S-ART) model (Van Dam et al., 2012) and neurocognitive perspectives proposed by Malinowski (2013). The predominance of attentional constructs is consistent with foundational definitions such as Bishop et al. (2004),

which conceptualize mindfulness as a process of attention regulation and open monitoring. However, the increasing presence of self-monitoring and emotional regulation in more recent definitions points to more integrative models that include metacognition and adaptive self-regulation (Dorjee, 2016; Zelazo & Lyons, 2012). Notably, the lack of representation of strategic planning and decision-making suggests that mindfulness is still primarily viewed as a tool for experiential awareness rather than a mechanism for complex cognitive control. This may reflect the historical trajectory of Western conceptualizations of mindfulness, which emphasize nonjudgmental awareness and acceptance over explicit cognitive manipulation (Baer et al., 2006).

Disconnect Between Definitions and Mechanisms

Based on our interpretative synthesis, we observed a mismatch between how definitions emphasize attention and affect regulation and the mechanisms often highlighted in empirical executive function research, such as inhibitory control, working memory, psychological flexibility, and decentering (Hayes et al., 2006; Kashdan & Rottenberg, 2010; Malinowski, 2013). This observation should be considered a theoretically informed interpretation rather than the outcome of a dedicated meta-analytic test. For example, psychological flexibility enables individuals to respond adaptively to internal experiences without automatic or evaluative reactions (Rogge & Daks, 2021). This capacity is closely related to decentering – the ability to observe mental content from a detached perspective – which has been linked to metacognitive monitoring and emotional stability (Hayes et al., 2006; Kashdan & Rottenberg, 2010). A meta-analysis by Cásedas et al. (2020) found that mindfulness-based interventions significantly improve EF performance compared to control groups, with the largest effects observed in working memory ($g = 0.42$) and inhibitory control ($g = 0.42$). These findings highlight mindfulness as a mechanism that facilitates selective attention, interference suppression, and reflective information processing (Malinowski & Shalamanova, 2017).

Furthermore, the Unified Flexibility and Mindfulness (UFM) model by Rogge and Daks (2021) integrates mindfulness and psychological flexibility into a process-oriented framework. It proposes that mindfulness practices cultivate decentering and emotional flexibility, which support adaptive behavior and value-driven decision-making. These findings point to a mismatch between the descriptive scope of mindfulness definitions and the neurocognitive mechanisms through which mindfulness exerts its effects (Malinowski, 2013). Future theoretical models should explicitly incorporate these more complex regulatory processes.

Limitations and Future Directions

This study has several limitations. First, the inclusion criteria were limited to English-language articles and peer-reviewed sources indexed in Google Scholar,

which may have introduced sampling bias. Second, although the coding framework was theoretically grounded and reviewed by two independent raters, the process remains partially subjective. Third, the review focused exclusively on definitions and not on the operationalizations used in measurement tools or intervention protocols. A further limitation is the five-year time window (2019–2024), which may exclude earlier relevant conceptual work. Additionally, the temporal trend analysis was based on the publication years of cited mindfulness definitions rather than those of the included studies; therefore, it should be interpreted as a contextual supplement rather than a comprehensive longitudinal assessment.

Future research should explore the relationship between theoretical definitions and their practical applications, distinguish between mindfulness as a transient state and as a regulatory process, and examine cultural variations in the conceptualization of mindfulness. Longitudinal and neurocognitive studies could help validate more comprehensive models of mindfulness that integrate multiple EF categories.

Conclusion

This systematic analysis demonstrated that mindfulness is most commonly defined in academic literature by executive functions related to attention regulation, self-monitoring, and emotional and behavioral regulation. Less frequent inclusion of functions such as planning, strategic organization, or decision-making suggests that mindfulness is primarily conceptualized as a tool for present-moment awareness and adaptive regulation rather than as a comprehensive control process. The evolution of definitions over time indicates a gradual shift toward a broader and more dynamic understanding of the cognitive and affective dimensions of mindfulness.

The observed discrepancy between theoretical definitions of mindfulness and the empirically supported mechanisms through which it operates – such as psychological flexibility, decentering, inhibitory control, and working memory – highlights the need for a deeper integration of neurocognitive findings into conceptual models. While definitions often emphasize mindful awareness and acceptance, the actual effects of mindfulness practice involve more complex dynamics that extend into behavioral regulation and higher-order cognitive processes.

Future research should systematically connect definitional frameworks with verifiable mechanisms of action. It is equally important to develop new models that conceptualize mindfulness not only as a state of conscious experience but also as a dynamic interplay of executive and metacognitive functions. Such a reconceptualization of mindfulness could inform the refinement of measurement tools, enhance the precision of intervention designs, and ultimately contribute to the promotion of sustainable well-being outcomes. Understanding how specific executive processes shape the construct of mindfulness offers important insights for designing interventions aimed at enhancing well-being in clinical, educational, and organizational settings.

This review would contribute to interdisciplinary understandings of mindfulness by integrating theoretical perspectives from psychology, cognitive neuroscience, and well-being science.

Author Contribution Statement. **Matej Hrabovský:** Conceptualization, Methodology, Investigation, Formal analysis, Writing – Original draft, Writing – Review & Editing; **Iveta Kovalčíková:** Conceptualization, Methodology, Supervision, Writing – Review & Editing, Funding acquisition, Project administration.

References

* *Included in the systematic review*

- *Alvear, D., Soler, J., & Cebolla, A. (2022). Meditators' non-academic definition of mindfulness. *Mindfulness*, 13(6), 1544–1554. <https://doi.org/10.1007/s12671-022-01899-3>
- *Anālayo, B. (2022). Monitoring and acceptance: Key dimensions in establishing mindfulness. *Mindfulness*, 13(8), 1901–1906. <https://doi.org/10.1007/s12671-021-01770-x>
- Anālayo, B. (2018). The emphasis on the present moment in the cultivation of mindfulness. *Mindfulness*, 10(3), 571–581. <https://doi.org/10.1007/s12671-018-1074-1>
- Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. *Child Neuropsychology*, 8(2), 71–82. <https://doi.org/10.1076/chin.8.2.71.8724>
- Aromataris, E., & Munn, Z. (Eds.). (2020). *JBI manual for evidence synthesis*. Joanna Briggs Institute. <https://doi.org/10.46658/JBIMES-20-01>
- Baddeley, A. D. (1996). Exploring the central executive. *The Quarterly Journal of Experimental Psychology: Section A*, 49A(1), 5–28. <https://doi.org/10.1080/713755608>
- Baddeley, A. D. (2002). Working memory: Looking back and looking forward. *Nature Reviews Neuroscience*, 4(10), 829–839. <https://doi.org/10.1038/nrn1201>
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10(2), 125–143. <https://doi.org/10.1093/clipsy.bpg015>
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27–45. <https://doi.org/10.1177/1073191105283504>
- *Baminiwatta, A., & Solangaarachchi, I. (2021). Trends and developments in mindfulness research over 55 years: A bibliometric analysis of publications indexed in Web of Science. *Mindfulness*, 12(9), 2099–2116. <https://doi.org/10.1007/s12671-021-01681-x>
- Barkley, R. A. (1997). Behavioural inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. In D. A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (pp. 69–89). Guilford Press.

- Barkley, R. A. (2011). Executive functions: What they are, how they work, and why they evolved. Guilford Press.
- *Bayle-Cordier, J., Rouvelin, P., Savoli, A., & Vieira-da-Cunha, J. (2021). An integrative model of corporate mindfulness: A systematic literature review. *Canadian Journal of Administrative Sciences*, 39(2), 199–212. <https://doi.org/10.1002/cjas.1655>
- *Bender, S. L., Lawson, T., & Palacios, A. M. (2023). Mindfulness measures for children and adolescents: A systematic review. *Contemporary School Psychology*, 27(1), 104–117. <https://doi.org/10.1007/s40688-022-00433-5>
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Specia, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11(3), 230–241. <https://doi.org/10.1093/clipsy.bph077>
- *Bisht, P., & Upreti, R. (2023). Mindfulness and mindfulness-based interventions: A review study. *Indian Journal of Positive Psychology*, 14(2), 256–258.
- Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review* (2nd ed.). SAGE Publications.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822–848. <https://doi.org/10.1037/0022-3514.84.4.822>
- *Bunjak, A., Černe, M., & Schölly, E. L. (2022). Exploring the past, present, and future of the mindfulness field: A multitechnique bibliometric review. *Frontiers in Psychology*, 13, Article 792599. <https://doi.org/10.3389/fpsyg.2022.792599>
- Burgess, P. W. (1997). Theory and methodology in executive function research. In P. Rabbitt (Ed.), *Methodology of frontal and executive function* (pp. 81–116). Psychology Press. <https://doi.org/10.4324/9780203344187>
- *Cásedas, L., Pirruccio, V., Vadillo, M. A., & Lupiáñez, J. (2020). Does mindfulness meditation training enhance executive control? A systematic review and meta-analysis of randomized controlled trials in adults. *Mindfulness*, 11(2), 411–424. <https://doi.org/10.1007/s12671-019-01279-4>
- *Cassaniti, J. L. (2021). Mindfulness or Sati? An anthropological comparison of an increasingly global concept. *Journal of Global Buddhism*, 22(1), 105–120. <https://doi.org/10.5281/zenodo.4727577>
- Chiesa, A. (2013). The difficulty of defining mindfulness: Current thought and critical issues. *Mindfulness*, 4(3), 255–268. <https://doi.org/10.1007/s12671-012-0123-4>
- *Choi, E., Farb, N., Pogrebtsova, E., Gruman, J., & Grossmann, I. (2021). What do people mean when they talk about mindfulness? *Clinical Psychology Review*, 89, Article 102085. <https://doi.org/10.1016/j.cpr.2021.102085>
- Corporation for Digital Scholarship. (n.d.). *Zotero* [Computer software]. Roy Rosenzweig Center for History and New Media. <https://www.zotero.org>
- Crone, E. A. (2009). Executive functions in adolescence: Inferences from brain and behavior. *Developmental Science*, 12(6), 825–830. <https://doi.org/10.1111/j.1467-7687.2009.00918.x>

- *Daniel, C., Walsh, I., & Mesmer-Magnus, J. (2022). Mindfulness: Unpacking its three shades and illuminating integrative ways to understand the construct. *International Journal of Management Reviews*, 24(4), 654–683. <https://doi.org/10.1111/ijmr.12296>
- Dawson, P., & Guare, R. (2010). *Executive skills in children and adolescents: A practical guide to assessment and intervention* (2nd ed.). Guilford Press.
- Denckla, M. B. (1996). Research on executive function in a neurodevelopmental context: Application of clinical measures. *Developmental Neuropsychology*, 12(1), 5–15. <https://doi.org/10.1080/87565649609540637>
- Dorjee, D. (2016). Defining contemplative science: The metacognitive self-regulatory capacity of the mind, context of meditation practice and modes of existential awareness. *Frontiers in Psychology*, 7, Article 1788. <https://doi.org/10.3389/fpsyg.2016.01788>
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107–115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- *Engström, M., Willander, J., & Simon, R. (2022). A review of the methodology, taxonomy, and definitions in recent fMRI research on meditation. *Mindfulness*, 13, 541–555. <https://doi.org/10.1007/s12671-021-01782-7>
- *Enkema, M. C., McClain, L., Bird, E. R., Halvorson, M. A., & Larimer, M. E. (2020). Associations between mindfulness and mental health outcomes: A systematic review of ecological momentary assessment research. *Mindfulness*, 11(11), 2455–2469. <https://doi.org/10.1007/s12671-020-01442-2>
- *Errasti-Pérez, J., Al-Halabi, S., López-Navarro, E., & Pérez-Álvarez, M. (2022). Mindfulness: Why it may work and why it is sure to succeed. *Behavioral Psychology / Psicología Conductual*, 30(1), 235–248. <https://doi.org/10.51668/bp.8322112n>
- Fuster, J. M. (2008). *The prefrontal cortex* (4th ed.). Academic Press.
- *Giannou, K., & Mantzios, M. (2023). Meditative and non-meditative mindfulness-based interventions for mind and body. *BMC Complementary Medicine and Therapies*, 23(1), 235. <https://doi.org/10.1186/s12906-023-04069-7>
- Goldstein, S., & Naglieri, J. A. (Eds.). (2013). *Handbook of executive functioning*. Springer. <https://doi.org/10.1007/978-1-4614-8106-5>
- *Hadash, Y., & Bernstein, A. (2019). Behavioral assessment of mindfulness: Defining features, organizing framework, and review of emerging methods. *Current Opinion in Psychology*, 28, 229–237. <https://doi.org/10.1016/j.copsyc.2019.01.008>
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44(1), 1–25. <https://doi.org/10.1016/j.brat.2005.06.006>
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288. <https://doi.org/10.1177/1049732305276687>
- Jankowski, T., & Holas, P. (2014). Metacognitive model of mindfulness. *Consciousness and Cognition*, 28, 64–80. <https://doi.org/10.1016/j.concog.2014.06.005>

- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delacorte Press.
- *Karl, J. A., & Fischer, R. (2022). The state of dispositional mindfulness research. *Mindfulness*, 13(6), 1357–1372. <https://doi.org/10.1007/s12671-022-01853-3>
- *Karl, J. A., Johnson, F. N., Bucci, L., & Fischer, R. (2021). In search of mindfulness: A review and reconsideration of cultural dynamics from a cognitive perspective. *Journal of the Royal Society of New Zealand*, 52(2), 168–191. <https://doi.org/10.1080/03036758.2021.1915804>
- Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, 30(7), 865–878. <https://doi.org/10.1016/j.cpr.2010.03.001>
- *Kee, Y. H., Li, C., Kong, L. C., Tang, C. J., & Chuang, K.-L. (2019). Scoping review of mindfulness research: A topic modelling approach. *Mindfulness*, 10(8), 1474–1488. <https://doi.org/10.1007/s12671-019-01136-4>
- *King, E., & Badham, R. (2020). The Wheel of Mindfulness: A generative framework for second-generation mindful leadership. *Mindfulness*, 11(1), 166–176. <https://doi.org/10.1007/s12671-018-0890-7>
- *Lee, J., Kim, K. H., Webster, C. S., & Henning, M. A. (2021). The evolution of mindfulness from 1916 to 2019. *Mindfulness*, 12(8), 1849–1859. <https://doi.org/10.1007/s12671-021-01603-X>
- *Levi, U., & Rosenstreich, E. (2019). Mindfulness and memory: A review of findings and a potential model. *Journal of Cognitive Enhancement*, 3(3), 302–314. <https://doi.org/10.1007/s41465-018-0099-7>
- *Levit-Binnun, N., Arbel, K., & Dorjee, D. (2021). The mindfulness map: A practical classification framework of mindfulness practices, associated intentions, and experiential understandings. *Frontiers in Psychology*, 12, 727857. <https://doi.org/10.3389/fpsyg.2021.727857>
- Lezak, M. D. (1995). *Neuropsychological assessment* (3rd ed.). Oxford University Press.
- Luu, K., & Hall, P. A. (2017). Examining the acute effects of mindfulness-based meditation on executive function: A systematic review. *Mindfulness*, 8(4), 873–880. <https://doi.org/10.1007/s12671-016-0661-2>
- Malinowski, P. (2013). Neural mechanisms of attentional control in mindfulness: Evidence from neuroimaging studies. *Frontiers in Neuroscience*, 7, Article 8. <https://doi.org/10.3389/fnins.2013.00008>
- Malinowski, P., & Shalamanova, L. (2017). Meta-attention as a core mechanism of mindfulness: A conceptual and narrative review. *Mindfulness*, 8(4), 1085–1098. <https://doi.org/10.1007/s12671-017-0697-0>
- Mayring, P. (2014). Qualitative content analysis: *Theoretical foundation, basic procedures and software solution*. Beltz. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-395173>
- *McCaw, C. T. (2020). Mindfulness ‘thick’ and ‘thin’ – A critical review of the uses of mindfulness in education. *Oxford Review of Education*, 46(2), 257–278. <https://doi.org/10.1080/03054985.2019.1667759>

-
- *Naglieri, J. A., & Goldstein, S. (2013). *Comprehensive Executive Function Inventory: Technical manual*. North Tonawanda, NY: Multi-Health Systems Inc.
- Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behaviour. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (Eds.), *Consciousness and self-regulation: Advances in research and theory* (Vol. 4, pp. 1–18). Plenum Press. https://doi.org/10.1007/978-1-4757-0629-1_1
- Oosterlaan, J., Scheres, A., & Sergeant, J. A. (2005). Which executive functioning deficits are associated with ADHD? *Journal of Abnormal Child Psychology*, 33(1), 69–85. <https://doi.org/10.1007/s10802-005-0935-y>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, Article n71. <https://doi.org/10.1136/bmj.n71>
- *Phan-Le, N. T., Brennan, L., & Parker, L. (2022). The search for scientific meaning in mindfulness research: Insights from a scoping review. *PLoS ONE*, 17(5), Article e0264924. <https://doi.org/10.1371/journal.pone.0264924>
- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., & Duffy, S. (2006). *Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme*. University of York. <https://www.york.ac.uk/media/crd/Guidance%20on%20the%20conduct%20of%20narrative%20synthesis%20in%20systematic%20review.pdf>
- Reynolds, C. A., & Holton, M. D. (2006). Executive function and metacognition in children. In G. G. Bear & K. M. Minke (Eds.), *Children's needs III: Development, prevention, and intervention* (pp. 135–148). National Association of School Psychologists.
- Richardson, W. S., Wilson, M. C., Nishikawa, J., & Hayward, R. S. A. (1995). The well-built clinical question: A key to evidence-based decisions. *ACP Journal Club*, 123(3), A12–A13. <https://doi.org/10.7326/ACPJC-1995-123-3-A12>
- Roberts Jr., R. J., & Pennington, B. F. (1996). An interactive framework for examining prefrontal cognitive processes. *Developmental Neuropsychology*, 12(1), 105–126. <https://doi.org/10.1080/87565649609540643>
- *Rogge, R. D., & Daks, J. S. (2020). Embracing the intricacies of the path toward mindfulness: Broadening our conceptualization of the process of cultivating mindfulness in day-to-day life by developing the Unified Flexibility and Mindfulness Model. *Mindfulness*, 12(3), 701–721. <https://doi.org/10.1007/s12671-020-01537-w>
- *Sadowski, I., Böke, N., Mettler, J., Heath, N., & Khoury, B. (2020). Naturally mindful? The role of mindfulness facets in the relationship between nature relatedness and subjective well-being. *Current Psychology*, 41(8), 5358–5373. <https://doi.org/10.1007/s12144-020-01056-w>
- Schreier, M. (2012). *Qualitative content analysis in practice*. SAGE Publications.

- *Schuman-Olivier, Z., Trombka, M., Lovas, D. A., Brewer, J. A., Vago, D. R., Gawande, R., Dunne, J. P., Lazar, S. W., Loucks, E. B., & Fulwiler, C. (2020). Mindfulness and behavior change. *Harvard Review of Psychiatry*, 28(6), 371–394.
<https://doi.org/10.1097/HRP.0000000000000277>
- Siegel, D. J. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being*. W. W. Norton & Company.
- *Shireen, H., Khanyari, S., Vance, A., Johannesson, H., Preissner, C., Dor-Ziderman, Y., Khoury, B., & Knäuper, B. (2022). Paying attention to the self: A systematic review of the study of the self in mindfulness research. *Mindfulness*, 13(6), 1373–1386.
<https://doi.org/10.1007/s12671-022-01844-4>
- Shapiro, S. L., Carlson, L. E., Astin, J., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62(3), 373–386. <https://doi.org/10.1002/jclp.20237>
- *Singh, D., Tripathi, J. S., & Raj, A. (2019). The benefits of mindfulness: Improving mental health and well-being. *IAHRW International Journal of Social Sciences Review*, 7(3), 427–430.
- *Sperling, E. L., Hulett, J. M., Sherwin, L. B., Thompson, S., & Bettencourt, B. A. (2023). The effect of mindfulness interventions on stress in medical students: A systematic review and meta-analysis. *PLoS ONE*, 18(10), Article e0286387.
<https://doi.org/10.1371/journal.pone.0286387>
- *Toniolo-Barrios, M., Brasil, A., & Pitt, L. F. (2020). Nine prolific years: An analysis of publications in mindfulness. *Mindfulness*, 11(5), 1077–1089.
<https://doi.org/10.1007/s12671-020-01321-w>
- *Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., Meissner, T., Lazar, S. W., Kerr, C. E., Gorchov, J., Fox, K. C. R., Field, B. A., Britton, W. B., Brefczynski-Lewis, J. A., & Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*, 13(1), 36–61.
<https://doi.org/10.1177/1745691617709589>
- *Wang, Y., Liao, L., Lin, X., Sun, Y., Wang, N., Wang, J., & Luo, F. (2021). A bibliometric and visualization analysis of mindfulness and meditation research from 1900 to 2021. *International Journal of Environmental Research and Public Health*, 18(24), Article 13150. <https://doi.org/10.3390/ijerph182413150>
- Wells, G. A., Shea, B., O'Connell, D., Peterson, J., Welch, V., Losos, M., & Tugwell, P. (2011). *The Newcastle–Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses*. Ottawa Hospital Research Institute.
https://www.ohri.ca/programs/clinical_epidemiology/oxford.asp
- *Whitfield, T., Barnhofer, T., Acabchuk, R., Cohen, A., Lee, M., Schlosser, M., Arenaza-Urquijo, E. M., Böttcher, A., Britton, W., Coll-Padros, N., Collette, F., Chételat, G., Dautricourt, S., Demnitz-King, H., Dumais, T., Klimecki, O., Meiberth, D., Moulinet, I., Müller, T., ... Marchant, N. L. (2022). The effect of mindfulness-based programs on cognitive function in adults: A systematic review and meta-analysis. *Neuropsychology Review*, 32(3), 677–702. <https://doi.org/10.1007/s11065-021-09519-y>

- *Yang, C.-H., & Conroy, D. E. (2020). Mindfulness and physical activity: A systematic review and hierarchical model of mindfulness. *International Journal of Sport and Exercise Psychology*, 18(6), 794–817.
<https://doi.org/10.1080/1612197X.2019.1611901>
- Zelazo, P. D., Frye, D., & Rapus, T. (1996). An age-related dissociation between knowing rules and using them. *Cognitive Development*, 11(1), 37–63.
[https://doi.org/10.1016/S0885-2014\(96\)90027-1](https://doi.org/10.1016/S0885-2014(96)90027-1)
- Zelazo, P. D., & Lyons, K. E. (2012). The potential benefits of mindfulness training in early childhood: A developmental social-cognitive neuroscience perspective. *Child Development Perspectives*, 6(2), 154–160. <https://doi.org/10.1111/j.1750-8606.2011.00215.x>

Premošćivanje jaza između usredotočene svjesnosti i izvršnih funkcija: konceptualna napetost i istraživačke mogućnosti – sustavni pregled prema PRISMA smjernicama

Sažetak

Konstrukt usredotočene svjesnosti vrlo je važan u psihologijskim i neuroznanstvenim istraživanjima, no u akademskoj literaturi i dalje nema njegove jedinstvene definicije. Cilj je ovoga sustavnog pregleda, provedenoga prema PRISMA metodologiji, bio ispitati kako se usredotočena svjesnost trenutno konceptualizira u odnosu na izvršne funkcije. Pretraživanjem baze Google Scholar identificirano je 36 prihvatljivih radova objavljenih između 2019. i 2024. godine koji su sadržavali eksplicitne definicije ili konceptualne okvire usredotočene svjesnosti. U kvalitativnoj analizi sadržaja korišteno je devet različitih kategorija izvršnih funkcija za kodiranje 102 izdvojene definicije. Najzastupljenije funkcije bile su regulacija pažnje, samonadgledanje te emocionalna i bihevioralna samoregulacija, što upućuje na to da se usredotočena svjesnost primarno definira kao metakognitivna sposobnost svjesnosti usmjerene na sadašnji trenutak i adaptivne kontrole. Rjeđe su se spominjale funkcije poput planiranja, organizacije i radnoga pamćenja. Analiza zajedničkoga pojavljivanja funkcija otkrila je dominantne klastere izvršnih funkcija, dok je vremenska analiza pokazala rastuću složenost definicija tijekom vremena. Posebno je važno da istraživanje identificira konceptualni jaz između naglasaka definicija na regulaciji pažnje i afekta te empirijskih nalaza koji ističu kognitivne mehanizme više razine poput psihološke fleksibilnosti i inhibitorne kontrole. Ti nalazi naglašavaju potrebu za integracijom izvršnih i neurokognitivnih procesa u buduće teorijske modele usredotočene svjesnosti da bi se unaprijedila konceptualna jasnoća, poboljšala mjerenja i dalo podlogu za osmišljavanje intervencija.

Cljučne riječi: usredotočena svjesnost, izvršne funkcije, sustavni pregled, pažnja, samoregulacija, konceptualizacija, PRISMA

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Appendix A

Definitions of Executive Function Categories Used in the Coding Framework

Category	Definition	Key References
Planning and Goal Setting	Planning involves the ability to set goals, anticipate potential consequences, and develop a sequence of steps to achieve those goals.	Anderson (2002); Burgess (1997); Goldstein & Naglieri (2013); Lezak (1995); Naglieri & Goldstein (2013); Reynolds & Holton (2006); Roberts & Pennington (1996)
Organization and Strategy Maintenance	The ability to systematically organize information, tasks, and procedures necessary for goal attainment.	Burgess (1997); Dawson & Guare (2010); Naglieri & Goldstein (2013); Roberts & Pennington (1996)
Working Memory	The capacity for temporary storage and manipulation of information required for cognitive operations.	Barkley (2011); Goldstein & Naglieri (2013); Naglieri & Goldstein (2013); Roberts & Pennington (1996)
Cognitive Flexibility	The ability to shift strategies and adapt to novel conditions by reorienting behavior.	Anderson (2002); Crone (2009); Naglieri & Goldstein (2013)
Inhibition and Impulse Control	The ability to inhibit automatic responses and regulate impulsive behavior for effective cognitive and behavioral management.	Crone (2009); Dawson & Guare (2010); Goldstein & Naglieri (2013); Naglieri & Goldstein (2013); Roberts & Pennington (1996)
Sustained Attention	Executive control of attention that enables selective focus on relevant stimuli and maintenance of concentration on a given task.	Anderson (2002); Goldstein & Naglieri (2013); Naglieri & Goldstein (2013); Roberts & Pennington (1996)
Self-Monitoring and Performance Regulation	The ongoing monitoring and evaluation of one's performance, including adjustment of strategies based on feedback.	Anderson (2002); Lezak (1995); Naglieri & Goldstein (2013); Oosterlaan et al. (2005)
Emotional and Behavioral Self-Regulation	Regulation of emotional and behavioral responses in alignment with long-term goals, supporting adaptive functioning.	Anderson (2002); Barkley (2011); Dawson & Guare (2010); Goldstein & Naglieri (2013); Naglieri & Goldstein (2013)
Problem Solving and Decision Making	The ability to analyze situations, generate alternatives, and select optimal strategies based on available information.	Barkley (2011); Burgess (1997); Naglieri & Goldstein (2013); Oosterlaan et al. (2005); Reynolds & Holton (2006)

