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Review Article

Rethinking Practice in Mindfulness-Based Interventions: A Theoretical Model of How Formal Practice, Informal Practice, Practice Quality, and Dispositional Mindfulness Interact Over Time

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Marcelo Demarzo¹

1. Mente Aberta – Brazilian Center for Mindfulness and Health Promotion – Department of Preventive Medicine, Escola Paulista de Medicina, Universidade Federal de São Paulo (UNIFESP), Brazil

Research on mindfulness-based interventions (MBIs) has consistently framed home practice as a central therapeutic ingredient. Nevertheless, the empirical literature remains heterogeneous regarding the amount of practice participants complete, the strength and consistency of associations between practice time and outcomes, and the relative contribution of formal versus informal practice. Meta-regression evidence is itself divided: one meta-analysis found a modest positive association between formal home practice and outcomes, while a subsequent, larger dose-response meta-regression found no significant dose-response effects at all. At the same time, a growing body of evidence suggests that practice quality and dispositional mindfulness may help explain why equivalent amounts of practice do not yield equivalent outcomes across participants. This theoretical article argues that research on MBI practice has been constrained by an overly static and linear dose-response model and proposes a developmental framework in which different dimensions of practice play distinct functional roles across phases of training. The model has three key features: first, the relationship between formal and informal practice is reframed as parallel and interdependent rather than a one-directional transfer; second, the model explicitly incorporates recursive and non-linear trajectories, including discontinuous, insight-based change, alongside gradual skill acquisition; and third, the maintenance phase is conceptualized as stabilization at a ceiling of benefit, with practice frequency—rather than duration—proposed as a driver of that stability. The model further integrates self-related mechanisms (e.g., decentering, cognitive defusion, disidentification) and distinguishes attentional, constructive, and deconstructive families of practice as a further source of heterogeneity in outcomes. This model integrates findings from meta-analyses on home practice and dispositional mindfulness, cross-sectional and longitudinal studies of lifetime and long-term practice, and emerging research on practice

quality and self-related mechanisms. It offers a more differentiated explanation for the mixed findings in the literature on practice dose: practice may matter, but not uniformly, not linearly, and not through a single mechanism across phases of training or types of practice. The article concludes with testable hypotheses, explicit limitations, and a research agenda for longitudinal, mechanism-focused studies, including in contextualized programs such as Mindfulness-Based Health Promotion.

Corresponding author: Marcelo Demarzo, demarzo@unifesp.br

Introduction

Mindfulness-based interventions (MBIs) are now established across clinical, educational, and community settings, with broad evidence supporting beneficial effects on stress, anxiety, depressive symptoms, well-being, and quality of life ^[1]^[2]. Yet one of the field's most persistent conceptual and practical questions remains unresolved: what role does mindfulness practice actually play in producing and maintaining these benefits?

Standard MBI pedagogy emphasizes between-session practice, especially formal meditation, as a core mechanism of change ^[3]^[4]. However, empirical findings are less straightforward than this pedagogical consensus might suggest. A meta-analysis of home practice in Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) found a positive but modest association between formal home practice and outcomes, with participants completing less practice than commonly prescribed on average ^[5]. A subsequent systematic review likewise concluded that the utility of home practice is likely meaningful but methodologically heterogeneous and insufficiently understood ^[6]. More recently, a larger dose-response meta-regression across 203 trials found no statistically significant dose-response relationship between formal practice amount and outcomes at all ^[7], directly contradicting the modest positive association reported by Parsons et al. ^[5]. A cross-sectional study of experienced meditators similarly found that dose-response relationships depended heavily on lifetime practice experience and individual moderators such as negative emotionality and practice goals, rather than following a simple linear pattern ^[8].

This heterogeneity raises a deeper theoretical issue. The dominant discourse often assumes a relatively simple dose-response model: more formal meditation should lead to better outcomes. But this assumption may be incomplete, and a recent conceptual synthesis has argued that reconciling these divergent findings requires a research agenda that treats dose-response as multidimensional and context-dependent rather than as a single empirical question to be resolved by any one meta-analysis ^[9]. Studies separating formal from informal practice suggest that informal mindfulness may show stronger associations with long-term maintenance, well-being, and generalization to daily life in at least some samples ^[10]^[11]^[12]. Meanwhile, emerging work on practice quality suggests that the effects of practice time may depend on whether practice is actually being enacted with awareness, receptivity, and a capacity to return from distraction ^[13]^[14]^[15]. Finally, meta-analytic evidence indicates that mindfulness training

changes self-reported dispositional mindfulness and that these changes are associated with psychological improvement ^[16].

Taken together, these findings suggest that “practice” in MBIs should not be treated as a single, static quantity, nor should its relationship to outcome be assumed to be linear or uniform across individuals. Rather than asking whether practice matters in general, the more productive question is which kind of practice matters, for whom, at what stage of training, through which mechanisms, and along which trajectory—gradual or discontinuous. Specifically, the model proposes that formal practice may be especially important early in training, when participants are still developing core attentional and metacognitive capacities, while remaining open to the possibility that some individuals experience insight-based, non-linear shifts that do not fit this gradual pattern (see Non-Linear and Insight-Based Change, below). As core capacities consolidate and dispositional mindfulness increases, the relative importance of practice may shift toward informal mindfulness in daily life and toward the quality, rather than sheer quantity, of ongoing practice—though this shift is treated as a probabilistic tendency rather than a fixed sequence, given that practice trajectories are also shaped by motivation, expectancy, personality, symptom burden, personal practice goals, prior contemplative experience, adverse effects, and context (see Assumptions, Recursiveness, and Limitations, below). This developmental model may help explain why the literature on practice dose has produced mixed results and may offer a more clinically useful framework for research and implementation.

Beyond a Static Dose-Response View of Practice

The intuitive appeal of a dose-response model is understandable. Formal mindfulness practice is visible, prescribed, and relatively easy to quantify in minutes or sessions ^[17]. Instructors often encourage regular meditation as a way to strengthen attentional stability, emotional regulation, and familiarity with present-moment experience. But ease of measurement should not be mistaken for theoretical sufficiency, and the divided meta-analytic record described above ^{[5][7]} is itself evidence that a single dose-response coefficient cannot capture the phenomenon.

The finding that formal home practice is associated with better outcomes on average does not establish that this association is linear, uniform across participants, or stable across time. Indeed, the meta-analytic estimate reported by Parsons et al. ^[5] was modest, not large; the broader methodological review by Lloyd et al. ^[6] underscored substantial variability in how practice was measured, reported, and analyzed; and Bowles et al. ^[9] argue explicitly that failing to find a dose-response effect in aggregated trial data does not constitute evidence against a dose-response relationship at the individual level, given that practice doses, practice types, and outcome measures vary enormously across the studies being pooled.

The field may therefore have conflated two distinct propositions: first, that formal practice is useful; and second, that increasing formal practice in a quasi-linear manner is the principal route to better outcomes for all practitioners. The first proposition is broadly supported. The second is far less certain, and this point is returned to below when discussing recursive and non-linear trajectories. In behavioral and contemplative interventions alike, active ingredients can change their functional role over time. A component that is essential during skill

acquisition may become less central once the skill is embodied, automatized in a beneficial way, or generalized to real-life contexts—though, as discussed under Practice Quality and under Assumptions and Limitations, this shift is unlikely to unfold identically for every practitioner. This logic is familiar from psychotherapy, rehabilitation, and health behavior change; for example, in cognitive-behavioral therapy, structured between-session homework is emphasized heavily during early treatment phases but is often explicitly faded as clients internalize skills and apply them spontaneously in daily life ^[18]. There is little reason to assume that mindfulness practice should be exempt from such developmental dynamics, though, as elaborated below, the pathway may be recursive rather than strictly sequential.

Formal and Informal Practice: Parallel, Interdependent Pathways

One source of confusion in the literature is the tendency to group all mindfulness practice together, and a second is the assumption that informal practice necessarily represents a transfer from formal practice. Formal practice typically involves dedicated periods of seated or lying meditation, movement, or body-based attention (e.g., body scan, sitting meditation, mindful movement). Informal practice involves intentionally bringing mindful awareness into everyday activities—for example, eating a meal, walking between meetings, washing dishes, or noticing bodily tension during a difficult conversation—interpersonal exchanges, emotional triggers, and moments of stress.

Although structured programs such as MBSR conventionally emphasize formal practice at first, this sequencing plausibly reflects a pedagogical strategy to avoid overwhelming beginners rather than a necessary developmental progression. In principle, individuals could begin with simple informal practices—mindfully brushing their teeth or tying their shoes—and only later deepen attentional and non-reactive capacities through formal sitting practice; people generally may understand what it means to brush their teeth mindfully without having first practiced body scan or breathing meditation. In both formal and informal practice, the core challenge is directing and sustaining attention on the task at hand. This challenge suggests that the relationship between formal and informal practice can be reframed not as a linear transfer from one to the other, but as parallel, interdependent pathways that can be entered in either order and that mutually reinforce one another through consistent, high-quality engagement.

This distinction matters empirically. Morgan et al. ^[12] found that, following an acceptance-based behavioral therapy for generalized anxiety disorder, informal mindfulness practice was significantly related to continued beneficial outcomes at follow-up, whereas formal practice was not significantly associated with the maintenance of gains. Birtwell et al. ^[10], in a large exploratory study, found that informal mindfulness practice was related to positive well-being and psychological flexibility, while the duration of formal practice showed weaker and less consistent associations. In a more recent chronic pain pilot, Brintz et al. ^[11] again found that informal, but not formal, home practice quantity was associated with multiple improved outcomes. Kakoschke, Hassed, Chambers, and Lee^[19] similarly reported that informal practice showed stronger relations than formal practice for some outcomes in a sample of medical students undergoing a five-week mindfulness-based lifestyle program.

These studies do not invalidate the role of formal meditation, but they do suggest that informal practice may be especially important for transfer and generalization to daily life, and that its relative importance need not be contingent on prior formal training. A theoretical implication follows: formal practice may be best understood as one training context, among others, in which foundational capacities are cultivated; informal practice may reflect a parallel route to the same capacities, or the successful application of capacities cultivated in either context. If this is correct, then an overemphasis on formal practice minutes as a prerequisite may obscure the more clinically relevant question of whether participants are becoming more capable of enacting mindfulness in daily life, by whatever route.

Practice Quality as a Distinct, Measurable Mechanism

A second major limitation of the current literature is its focus on quantity over quality, and a further limitation is that practice quality itself has often been left conceptually under-specified—at risk of overlapping with related but distinct constructs such as engagement, effort, motivation, adherence, expectancy, and perceived benefit. Practice quality is defined here, following Del Re et al. ^[13] and Goldberg et al. ^{[14][15]}, specifically as the degree to which attention is sustained on the intended object of practice, distraction is noticed and non-judgmentally returned from, and the practitioner relates to arising thoughts, emotions, and bodily sensations with receptivity rather than suppression or elaboration. This is distinct from engagement (whether a person practices at all), effort (subjective exertion, which may be high even when attentional quality is low), motivation (the reasons for practicing), adherence (conformity to a prescribed dose), and expectancy (anticipated benefit) — although these constructs plausibly interact with practice quality and should be measured alongside it in future studies, not conflated with it.

Two participants may report identical practice durations while engaging in profoundly different experiential processes: one may be mechanically “getting through” the exercise while remaining absorbed in rumination or self-criticism; another may be practicing with greater meta-awareness, non-judgment, and responsiveness to distraction. If so, then practice time alone is a relatively crude proxy for the process hypothesized to produce change. This concern is supported by the emerging literature on practice quality. Del Re et al. ^[13] showed that practice quality may be more informative than the amount of practice in predicting later psychological functioning. Goldberg et al. ^[15] later extended this line of work, reporting evidence that a brief practice-quality measure was reliable and valid, that greater practice time was associated with improved practice quality, and that improved practice quality mediated the relation between practice time and outcomes in MBSR. In effect, time appears to matter, at least in part, because it can support better-quality practice—but time is not the mechanism itself.

An important caveat is that progress in meditation may not always manifest as increasingly smooth or comfortable practice. Encountering obstacles, distraction, restlessness, or difficult emotional material may sometimes represent meaningful developmental engagement—direct contact with previously avoided experience—rather than an indicator of low-quality practice per se. A practitioner who notices and stays with a difficult emotional state, even

briefly and imperfectly, may be demonstrating higher-quality practice by the definition above than one whose apparent ease reflects avoidance or dissociation. Quality should therefore not be conflated with subjective comfort or apparent fluency; measurement strategies for future research—ecological momentary assessment (EMA), self-report scales capturing intentionality and attentional return, or behavioral/observational coding of practice episodes—should be designed to capture engagement with difficulty, not only its absence. This insight may be one of the most important conceptual advances for the next phase of MBI research: it allows mixed findings on practice dose to be reinterpreted not as evidence that practice is irrelevant, but as evidence that the field may often be measuring the wrong level of the process. Quality, by this definition, is not restricted to formal practice; the same attentional and receptive qualities plausibly apply to informal practice (e.g., multiple brief mindful moments during a meal may be more beneficial than one prolonged but distracted attempt to eat an entire meal mindfully), and quality itself likely fluctuates with context, fatigue, and motivation rather than remaining stable within a person.

Dispositional Mindfulness as a Developmental Marker

A third piece of the puzzle, alongside formal/informal practice and practice quality, is dispositional mindfulness. Although self-report mindfulness measures remain debated, they are widely used, psychometrically established, and responsive to mindfulness training. The Five Facet Mindfulness Questionnaire (FFMQ), derived from the factor analysis of several mindfulness measures, remains one of the most influential instruments in this domain ^{[20][21]}. Meta-analytic evidence by Quaglia, Braun, Freeman, McDaniel, and Brown^[16] found that mindfulness training produces small-to-moderate improvements across several dimensions of self-reported dispositional mindfulness, and that changes in these dimensions are associated with beneficial changes in mental health outcomes.

Support for a more differentiated understanding of dispositional mindfulness also comes from observational work showing that meditation practice is not uniformly associated with all mindfulness facets. Soler et al. ^[22], in a cross-sectional study of 670 participants, found that meditation experience was more strongly associated with the FFMQ facets of Observing and Non-Reactivity, moderately associated with decentering, and less strongly associated with Non-judging, Describing, and Acting with Awareness. This pattern is plausibly unsurprising rather than anomalous: several FFMQ facets, such as Acting with Awareness and Describing, are not directly rehearsed during formal focused-attention practice, which primarily trains Observing and Non-Reactivity to distraction ^[23]; the finding that formal practice duration correlates weakly with some facets of dispositional mindfulness may therefore reflect facet-specific measurement rather than the unimportance of formal practice, and the temporal sequence in which different facets emerge over training remains an open empirical question—for example, Observing may plausibly precede Acting with Awareness. Importantly, in the same study, frequency of practice and lifetime practice were more strongly related to mindfulness scores than session length, suggesting that the relationship between practice and dispositional mindfulness may be shaped more by continuity and repeated engagement than by the sheer

duration of individual sessions—a pattern that anticipates the frequency-based account of the maintenance phase developed below.

For the purposes of the present model, dispositional mindfulness should not be viewed as a perfect marker of contemplative development, but as a useful indicator that mindful skills are becoming more available in ordinary consciousness. Because trait-like self-report measures are unlikely to shift substantially within the first few weeks of training, early gains are expected to be concentrated in narrower, more state-like indices (e.g., momentary attentional control), with broader dispositional change emerging later as practice consolidates (see Figure 1).

Differentiating Families of Meditative Practice and Integrating Self-Related Mechanisms

The model outlined so far treats mindfulness practice largely along the dimensions of formal/informal, quantity, and quality, without distinguishing between different families of meditative technique. This is a simplification. Theoretical work distinguishes at least attentional, constructive, and deconstructive families of contemplative practice, which are hypothesized to rely on partially distinct mechanisms [24]. Attentional or focused-attention practices (e.g., breath-focused meditation) primarily cultivate attentional stability, meta-awareness, and cognitive decentering—the capacities emphasized in the early-phase formal practice described above. Constructive practices (e.g., loving-kindness and compassion meditation) cultivate specific adaptive affective and relational schemas. Deconstructive practices (e.g., self-inquiry, insight into impermanence or non-self) more directly target self-related processes, including identification with self-narratives, self-rigidity, and the perceived solidity of the self. Emerging empirical evidence supports this distinction: a three-arm randomized controlled trial comparing attentional and deconstructive meditation for depression prevention found that the two practice types produced improvements through partially distinct mechanisms, with deconstructive practice specifically implicated in reduced self-related vulnerability [25].

This distinction suggests that self-related mechanisms deserve a more central place in the model than a secondary extension of dispositional mindfulness. Many processes targeted by MBIs—rumination, emotional reactivity, psychological rigidity, threat appraisal, and attachment to beliefs—are closely tied to how the self is constructed and maintained. Recent work on deconstructive meditation and psychotherapy highlights mechanisms such as self-inquiry, cognitive defusion, self-flexibility, and transformations in self-perception as key drivers of change [26]. From this perspective, dispositional mindfulness may reflect not only the increasing availability of mindful skills in everyday life, but also a shift in the relationship to self-related experience; constructs such as disidentification, self-flexibility, reduced identity threat, or selflessness may provide a valuable bridge between practice and clinical outcomes, and hypotheses concerning these constructs are listed among the testable predictions below. Which family of practice is emphasized may also interact with phase of training: attentional practices may be especially suited to the early acquisition of core capacities described above, whereas constructive and deconstructive practices may become more central as training progresses and self-related material becomes more accessible—though this ordering is proposed tentatively and is itself an empirical question.

Non-Linear and Insight-Based Change

The argument developed so far still relies primarily on a gradual, cumulative view of skill acquisition, in which capacities are hypothesized to strengthen incrementally across the early, intermediate, and maintenance phases. This view is well suited to attentional training, but it may be insufficient to account for mechanisms involved in deconstructive or insight-oriented practice. In contemplative science and related traditions, some forms of meditative change are described as insight-based: improvements in well-being may arise not only from the progressive strengthening of attentional or regulatory capacities, but also from qualitative shifts in how experience and the self are perceived. These shifts may occur discontinuously, resembling threshold effects or phase transitions, rather than incremental gains proportional to practice time [24][26].

This perspective complements, rather than replaces, the developmental model: inconsistencies in dose-response findings may stem not only from variation in practice quantity, quality, or format, but also from the coexistence of different modes of change—gradual skill acquisition versus insight-based transformation. A null or inconsistent dose-response finding at the group level may partly reflect the episodic, threshold-like nature of insight for some practitioners, rather than the absence of an effect for any given individual. This is likely to be particularly relevant for deconstructive practices, where processes such as self-inquiry and insight into impermanence, interdependence, or non-self may induce transformations in self-perception that linear models are not well equipped to capture. The developmental model should therefore include two coexisting pathways—gradual and insight-based—rather than treating gradual skill acquisition as the only route through the same phases (see Figure 1 and hypotheses below).

A Developmental Model of Practice in MBIs

Integrating the preceding sections, the following theoretical model is proposed (Figure 1), understood as a probabilistic tendency across phases rather than a fixed sequence every practitioner must follow.

In the early phase of an MBI (approximately the first 4–8 weeks of a standard structured program), formal practice is especially important because it provides a structured environment for acquiring basic mindfulness skills: attentional stabilization, repeated recognition of distraction, reorientation to present-moment experience, and a less reactive stance toward inner events. Practice quality during this phase should not be equated with ease or fluency; even sincere, effortful practice accompanied by frequent distraction and frustration can constitute high-quality engagement in the sense defined above (sustained, non-avoidant contact with the intended object of attention), and early gains are expected to be modest and concentrated in narrower, state-like indices rather than broad trait change.

In the intermediate phase (plausibly weeks 8–26, though this range is offered tentatively pending empirical calibration), the central process is not merely continued exposure to meditation, but increasing transfer along the parallel formal–informal pathways described above. Participants begin to notice automaticity in everyday life, pause more readily, and recruit mindful awareness in emotionally salient situations. Increases in dispositional mindfulness during this phase may reflect the consolidation of this shift, and self-related mechanisms (decentering, early cognitive defusion) may begin to become more

accessible, particularly for practitioners engaging in constructive or deconstructive practice families.

In the later or maintenance phase (beyond approximately 6 months to 1 year, informed by longitudinal evidence discussed below), a decline account of formal practice is rejected in favor of a stabilization account. Longitudinal evidence from a 1-year quasi-randomized trial of Mindful Self-Compassion (MSC) and MBSR found that most gains in anxiety, depression, perceived stress, affect, and psychological flexibility were achieved by the end of the standard 8-week program, with continued practice over 6 and 12 months maintaining rather than further enhancing these benefits [27]. Convergently, a study of long-term loving-kindness and compassion meditators (average of approximately 6 years of practice) found virtually identical levels of self-compassion, anxiety, and cognitive fusion to those reported after 12 months of standard training, with self-compassion and reduced cognitive fusion acting as mediating mechanisms [28]. Rather than defining the maintenance phase by a continued increase in benefit, this model defines it as stabilization at a ceiling of adaptive capacities (e.g., self-compassion, psychological flexibility) and a floor of symptom-related variables (e.g., anxiety, cognitive fusion). It predicts that long-term stability depends not primarily on whether formal practice quantity continues to increase, but on the consistency, or frequency, of ongoing practice: in long-term LKCM practitioners, near-daily practice frequency (5–6 days/week) was associated with reaching ceiling levels of self-compassion earlier than practicing 2–4 days/week, regardless of total accumulated years of practice [28]. Informal practice and the ability to enact mindfulness under real-world conditions remain proposed as stronger predictors of sustained gains than formal practice quantity alone in this phase, consistent with a musical-instrument analogy in which some minimal, regular formal practice may still be necessary to maintain complex emotion-regulation skills even once they are largely embodied; the model does not assume that formal practice ever becomes strictly unnecessary, only that its relative weight, and the metric that best predicts stability (frequency rather than duration), changes.

Throughout all phases, practice quality functions as a transversal mechanism, shaping whether time spent practicing is translated into actual skill acquisition and change, and a parallel, nonlinear pathway of insight-based, discontinuous change (see above) may operate alongside this gradual trajectory for at least some practitioners, particularly in deconstructive practice.

This model helps explain why the literature on practice dose is mixed. If formal practice is most influential early on but less determinant, in absolute quantity, once skills are embodied and stabilized at a ceiling, then studies measuring aggregate practice across whole interventions or follow-up periods may blur phase-specific effects. If practice frequency rather than duration is the relevant maintenance-phase metric, models using total accumulated minutes may misspecify the dose-response relationship for long-term practitioners. If informal practice is often undermeasured, key pathways of generalization may remain invisible. If practice quality is omitted, null findings for minutes practiced may reflect measurement error at the level of mechanism, not the absence of an active process. And if insight-based change is real for some practitioners, pooling it with gradual-change practitioners in a single linear model may obscure both patterns.

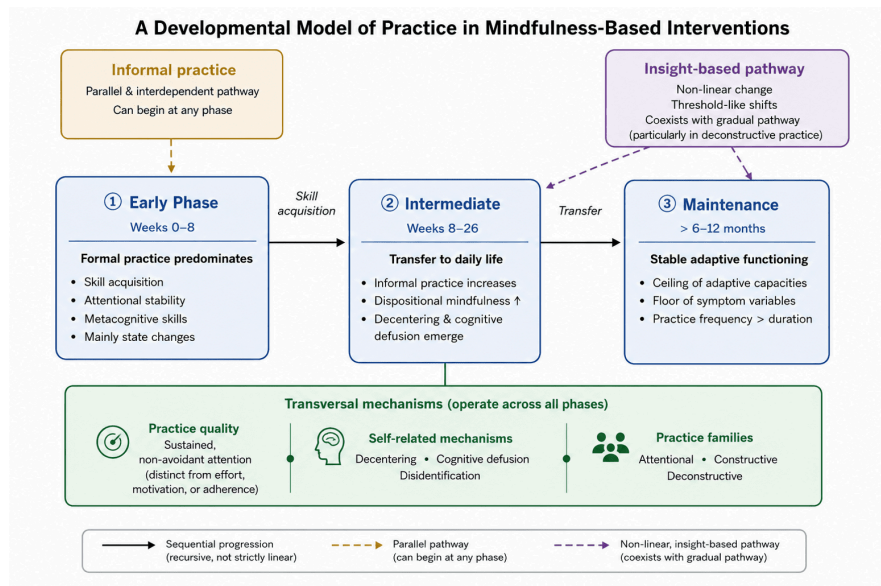


Figure 1. Developmental model of practice in mindfulness-based interventions. The model proposes three sequential phases, though individual trajectories are expected to be recursive rather than strictly one-directional (see Assumptions, Recursiveness, and Limitations). In the early phase (approximately weeks 0–8 of a standard structured program), formal practice is emphasized because it provides a structured environment for acquiring core attentional and metacognitive skills; even effortful practice marked by frequent distraction constitutes high-quality engagement at this stage, and gains are expected to be modest and concentrated in narrow, state-like indices rather than broad trait change. In the intermediate phase (plausibly weeks 8–26), the central process shifts from skill acquisition to transfer: dispositional mindfulness begins to increase, informal practice becomes more prominent, and early self-related shifts such as decentering and cognitive defusion may emerge. In the later or maintenance phase (beyond approximately 6–12 months), the model rejects a simple decline account of formal practice in favor of stabilization at a ceiling of adaptive capacities (e.g., self-compassion, psychological flexibility) and a floor of symptom-related variables (e.g., anxiety, cognitive fusion); long-term stability in this phase is proposed to depend primarily on the frequency, rather than the duration, of ongoing practice. The informal practice pathway (top left) is depicted as parallel and interdependent with formal practice rather than as its downstream product, and can be entered at any phase. A separate, dashed pathway (top right) represents nonlinear, insight-based change: discontinuous, threshold-like shifts in self-perception that may coexist with the gradual pathway for some practitioners, particularly those engaged in deconstructive practice. Practice quality (sustained, non-avoidant attention distinct from effort, motivation, or adherence) and self-related mechanisms (e.g., decentering, cognitive defusion, disidentification) are depicted as transversal mechanisms operating across all three phases, together with the broader distinction between attentional, constructive, and deconstructive families of practice, which are hypothesized to rely on partially distinct mechanisms and to become differentially relevant across phases of training.

Assumptions, Recursiveness, and Limitations

This model rests on a narrower evidential foundation than a fully specified developmental theory would require, and its main assumptions are stated explicitly here. The first assumption is that the early-to-maintenance

progression described above holds on average, while acknowledging that individual trajectories are very likely to be recursive rather than strictly sequential: practitioners may cycle back toward greater reliance on formal practice following relapse, life stress, or renewed symptom burden, and the model does not predict irreversible, one-directional progression through phases. The second assumption is that dispositional mindfulness, despite well-documented concerns about self-report validity, functions as a useful, if imperfect, marker of internalization rather than a direct measure of contemplative development. The third assumption is that the ceiling/floor account of maintenance, derived from Crego et al. [27] and Yela et al. [28], generalizes beyond MSC, MBSR, and long-term LKCM practice to MBIs more broadly; this has not yet been tested directly. The fourth assumption is that practice quality can, in principle, be measured with adequate reliability using the ecological momentary assessment, self-report, and behavioral coding strategies noted above, although validated instruments for informal-practice quality specifically remain underdeveloped.

Several factors likely moderate or disrupt the proposed trajectory and are only lightly incorporated into the model as presented: motivation and practice goals (which Bowles et al. [8] found to moderate dose-response relationships directly), expectancy, personality traits such as negative emotionality, symptom burden and diagnostic status, prior contemplative experience, adverse or unwanted effects of practice, and broader life context (e.g., caregiving demands, work schedules). The model should therefore be read as describing a central tendency across phases and mechanisms, not a normative sequence that every practitioner is expected to follow, and is best regarded, in its current form, as an organizing heuristic for generating testable hypotheses rather than as a fully falsifiable developmental theory.

Moreover, this is a theoretical article rather than a systematic review; the literature cited was selected to illustrate and support specific theoretical claims rather than through a pre-registered, exhaustive search strategy, and a formal risk-of-bias or quality assessment of the underlying primary studies was not conducted. The evidentiary base for some components of the model (e.g., the ceiling/floor maintenance account) currently rests on a small number of studies from related but distinct intervention traditions (MSC, LKCM) rather than on MBI-specific longitudinal data, and generalization to other populations, cultures, and program formats should be treated as a hypothesis, not an established finding. Comparative psychometric evaluation of dispositional mindfulness instruments (e.g., FFMQ subscales versus other measures) was outside the scope of this article and would strengthen future empirical tests of the model. Finally, because the model integrates constructs from several partially independent literatures (dose-response meta-analysis, practice-quality research, self-compassion and cognitive-fusion research, and contemplative accounts of insight), some conceptual overlap between constructs is likely and will require empirical disambiguation.

Implications for Research

The model yields several testable hypotheses, offered as falsifiable predictions rather than established conclusions. First, the association between formal practice quantity and outcome should be strongest in the early phase of training and should weaken, in relative terms, as dispositional mindfulness increases. Second, informal practice should be more strongly associated with maintenance

and ecological generalization of benefits than with initial acquisition and should predict outcomes independently of prior formal practice quantity (testing the parallel-pathways account against a strict transfer account). Third, practice quality should mediate the relationship between formal practice time and change in both dispositional mindfulness and clinical outcomes, and should be measurable, and dissociable from engagement, motivation, and adherence, using EMA or behavioral coding. Fourth, in the maintenance phase, practice frequency should predict stability of gains better than cumulative practice duration, and psychological outcomes should show a ceiling/floor pattern (little further change beyond 6–12 months) rather than continued linear improvement. Fifth, a subset of practitioners, particularly those engaged in deconstructive practice, should show discontinuous rather than gradual change trajectories on measures of self-related processing, detectable with person-level growth-curve or change-point modeling rather than group-level linear regression. Sixth, participants with higher post-intervention dispositional mindfulness may require less intensive formal practice to maintain gains, provided informal practice and a minimal frequency of formal practice remain active.

These hypotheses cannot be adequately tested by relying on global post hoc estimates of total practice time. They require longitudinal designs with repeated measurement extending well beyond the standard 8-week endpoint (ideally to 6–12 months, following the design used by Crego et al. [27]), explicit modeling of interactions, mediation, and individual-level change trajectories (e.g., growth mixture models capable of detecting discontinuous subgroups), and better measurement of informal practice, practice quality, and self-related mechanisms, all of which remain comparatively underdeveloped in the literature. Future work should also directly compare attentional, constructive, and deconstructive practice families within the same study design, and should assess adverse or unwanted effects of practice alongside benefits, since difficulty during practice may index either poor-quality engagement or meaningful developmental contact with avoided material, and current designs cannot yet distinguish these possibilities. For contextualized and implementation-oriented programs, including Mindfulness-Based Health Promotion [29], this research agenda may be particularly relevant because the practical goal is often not only symptom reduction but sustainable transfer of mindfulness into daily living, self-care, and health behavior.

Clinical and Teaching Implications

This model also carries implications for teaching and implementation, offered here as considerations for instructors to weigh against their own clinical judgment rather than as prescriptive rules. It suggests that instructors may find it useful to move beyond a uniform emphasis on minutes practiced and toward a more nuanced pedagogy—while recognizing that the historical emphasis on duration in mindfulness teaching and research likely reflects practical measurement constraints (duration is easy to track, whereas quality and informal practice are not) rather than rigidity or lack of sophistication on the part of instructors. Early in training, a clearer emphasis on regular formal practice may be justified. Later, participants may benefit from guidance that helps them recognize how mindfulness is showing up in ordinary life, not only in dedicated meditation sessions, and from being told explicitly that maintaining gains may depend more on the frequency of brief practice than on lengthening individual sessions. Monitoring practice quality—using concrete tools such as

brief practice diaries with quality prompts, periodic EMA check-ins, or structured debriefs—may be at least as informative as tracking adherence to a prescribed dose. A participant who practices less but with increasing clarity, receptivity, and transfer, including through informal practice, may be progressing in a clinically meaningful way even if they do not conform to idealized practice prescriptions; conversely, a participant who reports encountering difficulty or resistance during practice should not automatically be assumed to be practicing poorly.

None of this implies that formal meditation becomes dispensable. Rather, its function may evolve, and evidence on long-term practitioners suggests some minimal, regular formal practice frequency likely remains relevant for maintaining complex emotional-regulation skills even once they are largely embodied [28]. For some individuals, formal practice will remain central over the long term; for others, especially once foundational skills are embodied, the balance may shift toward a more integrated, informal, and context-sensitive mode of practice. A mature science of MBIs should be able to account for both trajectories, and for practitioners whose change follows a more discontinuous, insight-based course, without reducing any of these patterns to a single metric of total minutes.

Conclusion

The field of mindfulness-based interventions has reached a point at which the question is no longer only whether practice matters but how, for whom, and through which pathway it matters. The current evidence, including directly conflicting meta-analytic estimates of the dose-response relationship [5][7], supports the view that formal practice is beneficial on average, yet insufficient by itself to explain the heterogeneity observed across studies and participants. Informal practice, practice quality, self-related mechanisms, and dispositional mindfulness offer a more differentiated framework for understanding how mindfulness is acquired, embodied, and maintained over time, and evidence on long-term practice suggests that maintenance is better characterized as stabilization at a ceiling/floor of benefit, driven by practice frequency, than as either continued linear growth or simple decline.

This article has argued for a developmental model in which formal and informal practice function as parallel, interdependent pathways rather than a linear sequence; in which practice quality and self-related mechanisms operate transversally across phases; in which the maintenance phase is defined by stability rather than by decline in formal practice; and in which a non-linear, insight-based pathway may coexist with gradual skill acquisition for at least some practitioners. This model does not reject the importance of practice; it refines and complicates it, in ways that arguably better reflect the heterogeneity of the underlying literature than a more strictly sequential, purely dose-based formulation would. In its current form, the model functions as an organizing heuristic that generates specific, falsifiable hypotheses rather than as an established developmental theory, and this article has aimed to be explicit throughout about which claims are supported by direct evidence, which are extrapolated from related but distinct literatures, and which remain open questions for future longitudinal, mechanism-focused research.

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Potential Competing Interests

No potential competing interests to declare.

Data Availability

Data sharing is not applicable to this article as no new primary data were created or analyzed in this theoretical study.

Author Contributions

M.D. was the sole author and is responsible for all aspects of the manuscript.

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