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**A Multimodal and Multisensory Framework for Relaxation:
Integrating Progressive Muscle Relaxation, Creative Visualization, Music-Based Intervention, and Aromatherapy**

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Abstract

Relaxation-oriented interventions are commonly investigated as separate techniques despite engaging interacting somatic, cognitive, imaginal, affective, and sensory processes. This article develops a multimodal and multisensory framework integrating progressive muscle relaxation (PMR), creative visualization, music-based intervention, and inhalational aromatherapy. Four modalities are organized into three functional stages: **Stage I, somatic regulation through PMR; Stage II, cognitive-imaginal regulation through creative visualization; and Stage III, sensory-affective engagement through parallel and optional auditory (music) and olfactory (aromatherapy) pathways.** The framework distinguishes evidence supporting individual modalities and constituent mechanisms from the synthesized architecture proposed for their integration. It therefore does not assume that PMR facilitates imagery, that the proposed sequence is therapeutically optimal, or that combined music and aromatherapy produce additive or synergistic effects. Instead, modularity, personalization, participant agency, and multimodal parsimony are treated as central design principles. The model provides a testable structure for dismantling, sequencing, factorial, mechanistic, and moderation studies capable of determining whether multimodal integration offers benefits beyond simpler interventions, which components contribute those benefits, and for whom and under what conditions particular configurations are most appropriate.

Key-words - Progressive Muscle Relaxation; Creative Visualization; Mental Imagery; Music-Based Intervention; Inhalational Aromatherapy; Multimodal Intervention; Multisensory Integration.

Introduction

Relaxation is often studied through discrete interventions even though the experience ordinarily described as relaxation may involve bodily tension, attention, internally generated imagery, affective state, memory, and environmental sensory input. Progressive muscle relaxation, guided or creative imagery, music-based interventions, and aromatherapy have therefore developed largely within partially separate literatures, each emphasizing a different route into stress reduction, affective modulation, or subjective well-being. The existence of several potentially relevant modalities, however, does not by itself justify combining them. A multimodal intervention requires a defensible account of what each modality contributes, how the components are related, and which claims concern established evidence rather than theoretical synthesis.

This article develops such an account for four modalities: **progressive muscle relaxation (PMR), creative visualization, music-based intervention, and inhalational aromatherapy.** Their inclusion rests on different but complementary evidentiary foundations.

PMR provides a structured somatic method for attending to and reducing muscular tension; mental imagery can interact strongly with emotional experience; music engages auditory and affective processes and has been used therapeutically across stress- and anxiety-related contexts; and olfactory processing interacts with emotion, memory, and valuation, providing a plausible basis for considering inhalational aromatherapy within a relaxation-oriented framework.

The proposed architecture organizes these four modalities into three stages:

Stage I — Somatic Regulation: Progressive Muscle Relaxation

Stage II — Cognitive-Imaginal Regulation: Creative Visualization

Stage III — Multisensory-Affective Engagement: Music-Based Intervention and/or Inhalational Aromatherapy

The resulting progression can be summarized as:

Body → Imagination → Multisensory-Affective Experience

Four modalities therefore do not become four sequential stages. Music and aromatherapy occupy parallel positions within the third stage because they introduce distinguishable auditory and olfactory pathways rather than forming an evidence-based chronological hierarchy. Stage III may contain music, aroma, or both, allowing the framework to remain modular rather than requiring maximal multimodal exposure in every implementation.

The proposed sequence should not be mistaken for an empirically established universal therapeutic order. Evidence supporting the individual modalities does not automatically validate their combination, and the literature reviewed here does not establish that PMR necessarily improves subsequent visualization, that visualization reliably primes responses to music or aroma, or that music and aromatherapy produce additive or synergistic therapeutic effects when combined. The framework is therefore **evidence-informed but not yet a clinically validated composite protocol**.

Its theoretical purpose is more modest and, arguably, more useful. The article asks whether different relaxation-related modalities can be organized according to their principal modes of engagement—somatic, cognitive-imaginal, auditory-affective, and olfactory-affective—while preserving the distinction between intervention architecture and psychological mechanism. The sequence is organized for purposes of intervention design, but the underlying processes are expected to remain reciprocal: bodily state can influence affect, imagery can alter bodily experience, music can evoke memory and imagery, and odours can acquire emotional significance through learning and autobiographical association.

Individual variability therefore becomes part of the framework rather than an afterthought. Imagery ability, musical preference, odour preference and sensitivity, previous experience, autobiographical association, expectancy, cultural meaning, and environmental context can alter how the same nominal intervention is experienced. For this reason, the model combines a stable functional architecture with adaptable implementation rather than assuming that one standardized four-component protocol will suit every participant.

The article's contribution is consequently not the claim that combining familiar relaxation techniques produces a novel superior therapy. It is the construction of a **multimodal, multisensory, modular, and personalizable framework** that differentiates the functions of four modalities, specifies their relationship within a three-stage architecture, and generates empirical questions concerning sequence, incremental contribution, personalization, congruence, additivity, and possible cross-modal interaction.

The governing proposition is therefore deliberately bounded: **relaxation-oriented intervention can be organized coherently across somatic, cognitive-imaginal, auditory-affective, and olfactory-affective modes, but the clinical value, optimal sequencing, and interactive effects of their integration must be established through direct empirical testing rather than inferred from the evidence for the individual components**.

Conceptual Scope, Terminology, and Evidentiary Boundaries

Any attempt to integrate several relaxation-oriented modalities requires conceptual discipline before claims about their relationships can be made. The present framework therefore uses its principal terms operationally rather than assuming that labels such as *relaxation*, *visualization*, *music therapy*, *aromatherapy*, *multimodal*, or *holistic* designate homogeneous interventions. This section establishes the terminology and evidentiary rules governing the remainder of the article.

Progressive muscle relaxation (PMR) refers here to procedures derived from the systematic regulation of muscular tension and release. The framework accommodates modified PMR procedures that incorporate breathing, attentional settling, or abbreviated muscle sequences, but these should not be treated as identical to classical Jacobsonian progressive relaxation. PMR is designated *somatic regulation* because bodily tension and muscular awareness constitute its principal point of intervention; the term does not imply that its effects are exclusively physiological.

Creative visualization refers to the deliberate generation and manipulation of internally represented sensory or imaginal content. It is treated as a structured application of **mental imagery**, rather than as a separate cognitive faculty. *Guided imagery* is narrower in another respect: it ordinarily denotes imagery facilitated through externally provided verbal or recorded instructions. These terms should therefore not be used interchangeably. In this article, *creative visualization* identifies the cognitive-imaginal modality incorporated into the proposed framework, while *mental imagery* is used when discussing the broader psychological process.

Terminological precision is especially important for music. **Music therapy** denotes a professional therapeutic practice involving the systematic use of music and music-related experiences within a therapeutic relationship by an appropriately trained practitioner. **Music-based intervention** is the broader expression used when music is intentionally employed for health, well-being, stress reduction, or related purposes without necessarily satisfying the professional criteria of music therapy. **Music-facilitated relaxation** refers more narrowly to uses of music intended principally to support relaxation. Evidence from professional music therapy therefore cannot automatically be attributed to passive listening or other generic music-based procedures.

A similar distinction governs **aromatherapy**. The term refers here to intentional well-being- or therapeutically oriented use of aromatic plant-derived essential oils, while **inhalational aromatherapy** specifies exposure principally through olfaction. This must be distinguished from topical application, ingestion, and ordinary **ambient fragrance**. A pleasant environmental odour is not thereby an aromatherapy intervention, and findings concerning one essential oil, route, concentration, or delivery procedure cannot automatically be generalized to aromatherapy as a whole. The proposed framework concerns inhalational aromatherapy because its relevant functional pathway is olfactory-affective engagement; it does not prescribe particular oils, doses, or concentrations.

The framework is both **multimodal** and potentially **multisensory**, but these terms describe different properties. *Multimodal* refers to the incorporation of distinguishable intervention modalities—in this case PMR, creative visualization, music-based intervention, and inhalational aromatherapy. *Multisensory* refers to engagement across more than one sensory channel. The complete framework is therefore multimodal by design, whereas its third stage becomes explicitly multisensory when auditory and olfactory inputs are combined. The term *holistic* may be used descriptively to indicate attention to multiple dimensions of experience, but it is too imprecise to perform the framework's primary analytical work. *Multimodal*, *multisensory*, *modular*, and *personalizable* provide more testable descriptions.

Two evidentiary rules follow from these definitions. The first is **non-transferability of evidence**. Support for one component, intervention form, route, or population does not constitute evidence for another. PMR evidence does not establish the efficacy of visualization; findings from professional music therapy do not validate all music listening; evidence concerning particular essential oils does not validate every aromatic exposure; evidence for multisensory processing does not demonstrate therapeutic music–aroma synergy; and evidence supporting each modality separately does not establish the efficacy of their combined sequence. Component evidence and composite-protocol evidence must remain analytically distinct.

The second rule distinguishes three levels of claim. **Established claims** are those directly supported by appropriate existing evidence—for example, evidence concerning individual modalities or sufficiently demonstrated psychological and sensory processes. **Synthesized claims** arise when this article organizes supported findings into a new conceptual relationship not itself directly established by the cited literature. The proposed three-stage ordering belongs principally to this category. **Hypothesized claims** concern effects requiring direct empirical testing, including whether one stage primes another, whether particular combinations provide incremental benefit, whether auditory and olfactory components interact additively or synergistically, and whether the proposed sequence outperforms alternative configurations.

These categories concern **evidentiary status rather than plausibility**. A synthesized proposition may be theoretically well motivated without being empirically established, while a plausible hypothesis remains a hypothesis until tested. Throughout the article, citations supporting constituent findings should therefore not be read as citations validating the complete architecture.

These terminological and evidentiary boundaries constitute the methodological contract for what follows. The four modalities can now be examined individually before their proposed integration is evaluated, without allowing similarities of purpose, mechanism, or therapeutic language to erase differences in intervention type or strength of evidence.

3. Progressive Muscle Relaxation: Somatic Regulation

Progressive muscle relaxation (PMR) provides the **somatic starting point** of the proposed framework. Its basic rationale is that deliberate engagement with muscular tension and release can increase awareness of bodily tension while facilitating a more relaxed bodily

state. Classical progressive relaxation is associated particularly with Jacobson's systematic training in recognizing and reducing muscular tension (Jacobson 1938). Subsequent adaptations have shortened and modified the procedure considerably, and contemporary PMR should therefore be understood as a family of related practices rather than a single invariant protocol.

The procedure considered here is best characterized as **modified PMR**, not classical Jacobsonian progressive relaxation. It combines controlled breathing and attentional settling with progressive engagement across bodily regions. The participant first establishes a comfortable position and directs attention toward breathing and bodily sensation. Attention then proceeds systematically through the body, using deliberate muscular engagement and release, or focused awareness of tension and relaxation, across successive regions. The procedure culminates in whole-body awareness and a brief settling period. Elements such as breathing, abbreviated sequencing, and backward counting should therefore be identified as features of the modified procedure rather than attributed indiscriminately to classical PMR.

The detailed enumeration of every muscle group is less important for the present argument than the procedure's underlying organization. PMR directs attention toward **somatic discrimination**: noticing contrasts between tension and release and becoming more aware of changes in bodily state. Breathing and attentional instructions can support this process, but they should not be treated as independent evidence that PMR operates through one simple physiological mechanism. Relaxation responses are better understood as involving interacting bodily, attentional, and affective processes.

Contemporary evidence supports PMR as a useful relaxation-oriented intervention. Systematic-review and meta-analytic findings indicate reductions in stress, anxiety, and depressive symptoms across studied populations, although interventions vary in duration, delivery, comparison conditions, and participant characteristics (Muhammad et al. 2024). Earlier clinical and applied research likewise supports the use of progressive relaxation for reducing subjective tension and anxiety in a range of settings (Conrad and Roth 2007). Such findings justify treating PMR as an evidence-supported constituent modality, but they do not establish uniform effectiveness for every participant or context.

Within the present framework, PMR is described as **somatic regulation** because its most direct intervention target is bodily tension and awareness. This designation is functional rather than reductionist. PMR may influence attention and affect as well as muscular experience, just as cognitive and emotional states can alter bodily tension. Calling it somatic therefore identifies its principal point of entry into the proposed architecture; it does not imply that body, cognition, and emotion operate independently.

The modified procedure also provides a conceptually plausible transition from externally directed bodily activity toward more internally directed attention. After muscular engagement has ceased and attention has settled on a comparatively relaxed bodily state, the participant can be invited to shift toward internally generated imagery. This transition supplies the organizational rationale for placing PMR before creative visualization in the proposed sequence.

That rationale must remain evidentially bounded. Existing support for PMR establishes neither that muscular relaxation **causes improved imagery** nor that performing PMR before visualization produces better outcomes than visualization alone or an alternative sequence. The proposition that somatic settling may provide favourable conditions for subsequent cognitive-imaginal engagement is therefore a **synthesized bridge**, not an established therapeutic mechanism. PMR occupies Stage I because somatic regulation offers a coherent starting point for the framework; whether that placement confers incremental benefit is an empirical question to be tested rather than assumed.

Creative Visualization: Cognitive-Imaginal Regulation

Creative visualization constitutes the **cognitive-imaginal component** of the proposed framework. As established in §2, it is treated here as a structured application of the broader capacity for mental imagery and should not be conflated automatically with guided imagery. Whereas guided imagery commonly involves externally supplied verbal direction, creative visualization emphasizes the deliberate generation and manipulation of internally represented experience. Its relevance to relaxation lies not simply in “seeing” a pleasant scene but in the capacity of imagery to engage attention, emotion, bodily experience, and meaning.

A useful way to conceptualize the process is through four interrelated operations: **generation, maintenance, inspection, and transformation**. **Generation** refers to forming an internal representation in the absence of the corresponding external stimulus. The representation need not be exclusively visual: although the term *visualization* privileges visual imagery, imagined sound, touch, movement, temperature, or other sensory qualities may contribute to the experience. Individuals also differ substantially in imagery vividness, so successful participation should not be equated with producing exceptionally vivid mental pictures.

Maintenance involves sustaining the generated representation long enough for it to become an object of continued attention. Because internally generated imagery can be unstable, attention may repeatedly drift or the image may fade. The task is therefore not to achieve perfect mental representation but to return attention gently to the selected image or scene.

Inspection refers to attending to characteristics of the imagined content—its spatial organization, sensory qualities, emotional tone, or personally significant features. These operations make visualization an active cognitive process rather than passive fantasy.

Transformation introduces deliberate modification. An image may be enlarged or reduced, brightened or softened, moved, recontextualized, or replaced by another representation. Transformation is particularly important to the present framework because it demonstrates that imagery can be intentionally organized rather than merely experienced. A compact example inherited from the source procedure is the visualization of a **bright light**: the participant may generate an image of light, maintain attention to it, inspect its perceived qualities, and then imagine it expanding or moving through the body. The example illustrates the four operations without requiring the imagined light to be interpreted literally.

This qualification is essential where imagery is described in the language of “healing.” Imagining light spreading through the body may symbolically represent warmth, safety, restoration, release, or well-being, and such imagery may have subjective psychological value. It does **not**, however, establish that imagined light repairs tissue, treats disease, removes pathology, or produces any other specific biomedical effect. Symbolic therapeutic meaning and biomedical efficacy are different kinds of claims and must remain distinct.

The broader evidence base makes cognitive-imaginal engagement relevant to relaxation-oriented interventions. Mental imagery can evoke emotional responses and influence subjective and physiological experience, while guided-imagery interventions have been investigated across stress-, anxiety-, pain-, and well-being-related contexts. Reviews generally suggest potential benefits, although findings vary with population, imagery content, delivery format, comparator, intervention duration, and outcome measurement. The evidence therefore supports imagery as a psychologically consequential intervention domain without establishing that every visualization procedure is effective or interchangeable.

Within the present architecture, creative visualization is designated **cognitive-imaginal regulation** because internally generated representations constitute its principal mode of engagement. The designation again identifies a point of entry rather than an isolated mechanism: imagery can alter affect and bodily experience, just as bodily state and emotion can influence what is imagined. The stronger evidence for relationships between imagery and affect will become particularly important when the cross-modal mechanisms of the framework are examined in §8.

Creative visualization occupies **Stage II** because it provides a conceptual shift from the predominantly somatic engagement of PMR toward deliberate internally generated experience. Once muscular activity has subsided, attention can be redirected from bodily tension and release toward imagery generation and transformation. This ordering is coherent as an intervention design, but it should not be mistaken for evidence that PMR is a necessary prerequisite for imagery or that visualization performed after PMR is superior to visualization delivered independently.

Stage II therefore contributes a distinct cognitive-imaginal mode to the framework while preserving the article’s central evidentiary boundary: the effectiveness of imagery-related interventions and the plausibility of imagery–affect relationships are separable from the **synthesized claim** that creative visualization should occupy the second position in this particular multimodal sequence.

Music-Based Interventions: Auditory-Affective Engagement

Music constitutes the **auditory-affective component** of the proposed framework. Its relevance to relaxation arises not merely from the presence of sound but from music’s capacity to organize attention, evoke emotion, activate memory, shape expectancy, and alter the subjective character of an environment. Yet the broad phrase *use of music* encompasses interventions that differ substantially in purpose, professional structure, participant involvement, and evidentiary basis. As established in §2, **professional music therapy** must

therefore remain distinct from the broader categories of **music-based intervention** and **music-facilitated relaxation**.

This distinction is especially important when interpreting evidence. Music therapy may involve individualized assessment, therapeutic goals, an ongoing therapeutic relationship, and active or receptive musical methods implemented by a qualified practitioner (Bruscia 2014; Wheeler 2017). By contrast, a relaxation procedure may simply incorporate selected music as an auditory accompaniment. Findings from professional music-therapy research cannot automatically validate such listening-based procedures, although the broader evidence helps establish music as a therapeutically relevant domain.

Contemporary systematic reviews and meta-analyses generally support beneficial effects of structured music interventions on stress- and anxiety-related outcomes, while also demonstrating substantial heterogeneity. A multilevel meta-analysis of music therapy for stress-related outcomes reported meaningful overall benefits across varied populations and intervention formats (de Witte et al. 2022). More recent meta-analytic evidence concerning anxiety likewise suggests beneficial effects, particularly for self-reported anxiety, while physiological outcomes appear less consistent (de Witte et al. 2025). These findings support cautious inclusion of music within a relaxation framework but do not justify the stronger claim that any selected music will reliably reduce stress or produce uniform physiological relaxation.

The distinction between **subjective affective change** and **physiological regulation** is therefore important. A listener may feel calmer without corresponding changes across every physiological measure, while music can also increase arousal depending on its characteristics and meaning. Tempo, intensity, familiarity, preference, predictability, cultural association, and autobiographical memory can all shape response. For this reason, the present article characterizes music primarily in terms of **auditory-affective engagement** rather than automatic relaxation.

The affective relevance of music is supported by cognitive and neurobiological research. Music-evoked emotion involves distributed systems associated with auditory processing, reward, memory, valuation, and affect rather than a single “emotional centre” (Koelsch 2020). Music can evoke calmness, pleasure, nostalgia, sadness, tension, excitement, or other affective states, and these responses depend partly upon the interaction between musical structure and listener characteristics. Its role in the framework therefore derives from its capacity to influence the **affective environment**, not from an assumption that music is intrinsically calming.

For the present model, the principal implementation is **receptive music-based intervention**. Music may be introduced after the PMR and creative-visualization stages as an externally mediated auditory input that can support, sustain, or elaborate the experiential state already established. It may remain peripheral as background, become a focal object of listening, or interact with imagery and memory. The exact attentional role of music should not be predetermined, because active concentration on the music may be helpful for some participants and distracting for others.

Individual preference and familiarity are therefore relevant, but their detailed treatment belongs to §9. It is sufficient here to note that the same musical selection can produce different emotional responses across listeners. A piece selected as “relaxing” may evoke comfort in one participant, indifference in another, and unwanted autobiographical associations in a third. Music selection should consequently be regarded as an intervention variable rather than as a neutral background feature.

Within the integrated architecture, music occupies **Stage III-A** because it introduces an **auditory-affective pathway** after the predominantly somatic and cognitive-imaginal stages. Its parallel placement with inhalational aromatherapy does not imply that the two modalities operate through identical mechanisms or that both must be used simultaneously. Nor does evidence that music can influence affect establish that it necessarily reinforces preceding PMR or visualization, or that combining music with aroma produces therapeutic synergy.

The defensible claim is narrower: **music provides a distinct auditory-affective mode whose independent evidence base and capacity to engage emotion justify its inclusion within the proposed multisensory stage; its incremental contribution, optimal placement, and interaction with other modalities remain empirical questions.**

Aromatherapy: Olfactory-Affective Engagement

Aromatherapy constitutes the **olfactory-affective component** of the proposed framework. Its inclusion is not based on the assumption that essential oils possess a unique or intrinsically “holistic” therapeutic status. Rather, inhalational aromatherapy is relevant because olfactory processing is closely connected with affective and mnemonic experience, and because a substantial—though heterogeneous—clinical literature has examined essential-oil inhalation in relation to anxiety, stress, and subjective well-being.

As established in §2, the present article is concerned specifically with **inhalational aromatherapy**. This route is conceptually appropriate because the framework is interested in olfactory experience rather than in topical application, massage, ingestion, or other forms of essential-oil use. These routes are not interchangeable: they involve different exposures, mechanisms, confounders, and safety considerations. Ordinary pleasant fragrance should likewise not be treated as equivalent to aromatherapy merely because both involve smell.

The strongest theoretical basis for including olfaction lies in its relationship with **emotion and memory**. Contemporary reviews describe extensive reciprocal interactions among olfactory processing, mood, emotional appraisal, autobiographical memory, and valuation (Kontaris, East, and Wilson 2020). Odours can therefore function as psychologically meaningful cues rather than as neutral sensory additions. Their effects are not predetermined, however. The same aroma may be experienced as calming, neutral, unpleasant, nostalgic, or distressing depending on familiarity, intensity, learning history, autobiographical association, and immediate context.

This point is important because aromatherapy is often discussed as though particular oils possess fixed emotional properties. Such formulations encourage what

may be called **essential-oil exceptionalism**: the assumption that plant origin or conventional therapeutic reputation establishes efficacy independently of context. The present framework rejects that inference. Natural origin does not guarantee effectiveness, and it does not guarantee safety. Any observed effect may arise through several interacting pathways, including olfactory perception, hedonic appraisal, expectancy, associative learning, autobiographical memory, contextual meaning, and potentially chemical or physiological processes. The relative contribution of these pathways is not always clear.

The clinical evidence is sufficient to justify cautious inclusion but not strong enough to support universal claims. Systematic reviews of inhalational aromatherapy report favourable anxiety- or stress-related findings across many clinical studies, while simultaneously emphasizing marked heterogeneity in essential oils, botanical identification, concentration, delivery methods, exposure duration, populations, outcome measures, comparison conditions, and study quality (Hedigan, Sheridan, and Sasse 2023). Meta-analytic work likewise suggests reductions in anxiety in some settings, but between-study variability remains substantial. Such findings support the conclusion that **inhalational aromatherapy may provide benefit in particular contexts**, not that aromatherapy is an established anxiolytic treatment across populations.

The distinction between subjective and physiological outcomes must also remain explicit. Participants may report reduced anxiety or greater calmness without corresponding changes across physiological measures, and findings involving cortisol, cardiovascular variables, or other stress markers have been inconsistent. The role assigned here is therefore **olfactory-affective engagement**, not automatic physiological regulation.

Route-specific caution remains necessary even though detailed safety governance is reserved for §10. Inhalation avoids some concerns associated with topical or oral use, but it is not risk-free. Headache, coughing, irritation, aversion, nausea, sensory overload, or unwanted emotional associations may occur in susceptible individuals. Nor does this article recommend particular oils, blends, concentrations, or exposure durations; those questions require product-, population-, and outcome-specific evidence.

Within the proposed architecture, inhalational aromatherapy occupies **Stage III-B** because it provides an externally mediated **olfactory-affective pathway** parallel to music's auditory-affective pathway. Its placement does not imply that olfactory stimulation must occur after music, that both modalities must always be used together, or that simultaneous presentation creates therapeutic synergy. Music and aroma are structurally parallel because both can participate in affective experience through distinct sensory channels.

The defensible claim is therefore limited but sufficient: **olfactory processing is psychologically consequential, inhalational aromatherapy has a clinical literature showing potentially beneficial but heterogeneous anxiety- and stress-related outcomes, and these features justify its inclusion as a distinct olfactory-affective modality within the proposed multisensory stage. Its incremental value, optimal delivery, and interaction with music or preceding imagery remain empirical questions rather than established effects.**

An Integrated Multimodal and Multisensory Framework

The preceding sections establish four distinguishable relaxation-oriented modalities, each with its own intervention logic, evidentiary base, and limitations. Their coexistence, however, does not itself constitute an integrated framework. Integration requires a principled account of **why the modalities are brought together, what functional role each occupies, how their relationships should be organized, and which features of that organization are supported by evidence rather than introduced as theoretical synthesis**. The present model therefore moves beyond a catalogue of complementary techniques by arranging the four modalities according to their principal modes of engagement.

The proposed architecture contains **three stages but four modalities framework for multimodal relaxation (figure 1)**:

Figure 1. Three-Stage, Four-Modality Framework for Multimodal Relaxation

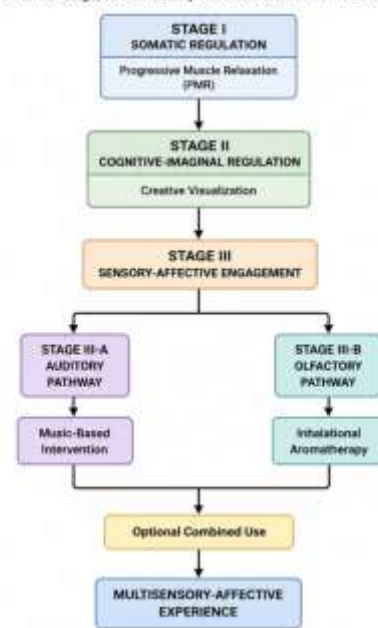


Figure 1. Three-stage, four-modality framework for multimodal relaxation. Progressive muscle relaxation constitutes Stage I (somatic regulation), followed by creative visualization as Stage II (cognitive-imaginal regulation). Stage III introduces two parallel and independently optional sensory-affective pathways: music-based intervention (III-A) and inhalational aromatherapy (III-B). Either pathway may be used independently or both may be combined to create a multisensory condition. Arrows represent the proposed intervention architecture rather than established unidirectional causal mechanisms. The complete sequence and any additive or synergistic effects among components remain hypotheses requiring direct empirical testing.

This organization reflects a functional progression from **bodily regulation**, through **internally generated cognitive-imaginal experience**, to **externally mediated sensory-affective engagement**. PMR occupies Stage I because muscular tension and bodily awareness provide its principal point of entry. Creative visualization occupies Stage II because deliberate generation and transformation of mental imagery shift the intervention

toward internally constructed experience. Music and inhalational aromatherapy occupy Stage III because they introduce auditory and olfactory inputs capable of participating in affective experience.

The distinction between **stages** and **modalities** is crucial. A stage identifies a functional position within the proposed intervention architecture; a modality identifies a distinguishable intervention form. Four modalities therefore need not produce four chronological stages. Music and aromatherapy belong to the same broad stage because both introduce externally presented sensory inputs after the somatic and cognitive-imaginal components, but they do so through different sensory channels. Their placement together does not erase the distinction between auditory and olfactory processing.

For the same reason, **Stage III-A and Stage III-B are parallel rather than sequential**. The model does not propose an evidence-based order of music → aroma or aroma → music. Either modality may be used independently, and both may be combined where appropriate. Stage III therefore permits at least three configurations:

Music alone
Aromatherapy alone
Music + aromatherapy

The third configuration makes the stage explicitly multisensory by engaging auditory and olfactory channels concurrently or within the same intervention period. Yet the fuller configuration should not be presumed superior merely because it contains more components. Combining sensory inputs may enhance experience for some participants, have little additional effect for others, or create distraction, incongruence, or sensory burden. The framework consequently treats music and aroma as **optional parallel pathways**, not compulsory ingredients of a maximal protocol.

This modularity extends to the framework as a whole. The three-stage sequence represents the article's **full conceptual architecture**, but it should not be interpreted as requiring every component in every application. A research design might compare PMR alone with PMR followed by visualization; test visualization with and without music; compare auditory and olfactory Stage III conditions; or evaluate the complete configuration against simpler alternatives. Modularity therefore makes the architecture experimentally decomposable as well as practically adaptable.

The proposed order—PMR → creative visualization → sensory-affective engagement—has a conceptual rationale but a deliberately bounded evidentiary status. Moving from overt muscular engagement toward internally generated imagery and then toward externally supplied sensory-affective input provides a coherent intervention progression. It may also reduce competition among tasks: deliberate muscle engagement can cease before sustained imagery begins, while music and aroma can subsequently provide environmental sensory input without requiring another comparably effortful cognitive task.

These considerations make the sequence **plausible as intervention design**, but they do not establish it as an optimal therapeutic order. As defined in §2, the architecture is principally a **synthesized claim**. Existing evidence supports the relevance of the individual modalities and several processes upon which the

framework draws; it does not directly demonstrate that these four components should be arranged in this particular sequence. Nor does it establish that PMR reliably prepares the mind for imagery, that imagery primes later sensory experience, or that the complete sequence outperforms alternative arrangements.

Several further propositions therefore remain **hypotheses** rather than features that can be built into the model as facts. One is **incremental contribution**: whether adding Stage II to Stage I, or Stage III to Stages I–II, produces benefits beyond the preceding configuration. A second is **order effect**: whether the proposed sequence performs differently from alternative sequences. A third is **cross-modal priming**: whether one modality alters responsiveness to a later modality. A fourth is **additivity or synergy**: whether music and aroma together produce effects equal to, greater than, or different from the sum of their independent contributions. A fifth is **congruence**: whether combinations experienced as mutually compatible produce different outcomes from combinations experienced as mismatched.

The framework also distinguishes **intervention sequence from psychological mechanism**. The fact that an intervention is delivered in the order Stage I → Stage II → Stage III does not imply that human regulation itself proceeds through a one-way somatic → cognitive → affective chain. Bodily state, imagery, emotion, attention, memory, expectancy, and sensory processing can influence one another reciprocally. The sequence therefore organizes **what is delivered and when**; it does not purport to reproduce a linear causal architecture of mind and body. The reciprocal mechanisms potentially connecting the stages are examined separately in §8.

The theoretical contribution of the model lies precisely in maintaining these distinctions. It proposes enough structure to generate testable intervention configurations without converting conceptual coherence into unwarranted clinical certainty. It is **multimodal** because it integrates four distinguishable intervention forms; **multisensory** when auditory and olfactory pathways are jointly engaged; **modular** because components can be isolated, omitted, or compared; and potentially **personalizable** because the same maximum architecture need not be imposed on every participant.

The resulting proposition is therefore narrower than the claim that four therapies work better together. The model proposes that **somatic regulation, cognitive-imaginal regulation, and optional auditory/olfactory affective engagement can be organized into a coherent three-stage architecture whose components and combinations are empirically separable**. Whether that architecture produces incremental, sequence-dependent, additive, synergistic, or person-specific benefits remains to be established experimentally.

Mechanisms and Cross-Modal Interaction: From Somatic Settling to Multisensory-Affective Experience

The architecture proposed in §7 specifies **how the intervention is organized**, not a single mechanism through which it must work. This distinction is essential. PMR, imagery, music, and olfaction engage partially overlapping bodily, attentional, affective, mnemonic, perceptual, and evaluative processes. Their integration is therefore better understood as a **distributed and reciprocal network** than as a linear causal chain in

which bodily relaxation automatically produces imagery, imagery produces affective readiness, and sensory stimulation finally produces relaxation. The underlying manuscript likewise distinguishes relatively well-supported constituent relationships from synthesized bridges and open hypotheses.

The first proposed transition, **PMR** → **creative visualization**, requires particular caution. PMR directs attention toward muscular states and their release, while visualization requires attention to internally generated representations. It is therefore plausible that the cessation of deliberate muscular activity and the resulting attentional settling may provide favourable conditions for imagery. The original source material similarly proposed that reduced bodily demands might facilitate internally directed attention. Yet this is not equivalent to evidence that PMR specifically improves imagery vividness, maintenance, or therapeutic effectiveness. The bridge is consequently **synthesized**: somatic settling provides a coherent transition into imagery, but a causal facilitation effect remains to be demonstrated.

The relationship between **imagery and affect** rests on firmer foundations. Mental imagery can evoke emotional responses, while imagery content and perspective can alter emotional processing (Lang et al. 1983; Holmes, Coughtrey, and Connor 2008; Holmes and Mathews 2010). Imagery also interacts with memory: internally generated representations may reconstruct previous experience, elaborate anticipated situations, or combine remembered material into novel scenes. This makes Stage II psychologically consequential beyond simple attentional diversion. Nevertheless, evidence that imagery influences affect does not establish the stronger sequential proposition that visualization necessarily creates an affective state that enhances subsequent responses to music or aroma. That proposed carry-over remains a plausible but unvalidated bridge.

The **music-affect relationship** is likewise comparatively well supported. Musical experience can engage auditory processing together with systems involved in reward, valuation, memory, attention, and emotion (Koelsch 2020). Music may therefore alter affective tone, evoke autobiographical memories, organize attention, or elicit imagery. Importantly, these effects are not intrinsically relaxing: music can produce calmness, pleasure, sadness, excitement, tension, or aversion. Mechanistically, the relevant proposition is therefore **music ↔ affect and memory**, not *music* → *relaxation*. Therapeutic outcome depends upon the character and meaning of the resulting experience.

The **olfaction-emotion and olfaction-memory relationships** provide another comparatively strong bridge. Olfactory processing interacts reciprocally with mood, emotion, memory, and valuation, and odours can become powerful learned or autobiographical cues (Kontaris, East, and Wilson 2020). This supports treating aroma as affectively consequential. It does not establish that a particular essential oil has a fixed emotional effect, nor that olfactory engagement necessarily reinforces preceding visualization. As with music, **mechanistic engagement is not equivalent to therapeutic success**: an odour may effectively retrieve memory while retrieving precisely the kind of memory that disrupts relaxation.

Stage III raises the additional question of **multisensory interaction**. Auditory and olfactory inputs do not have to remain psychologically independent merely because they enter through distinguishable sensory channels. Research supports distributed neural systems through which information from different sensory modalities can interact and be integrated (Scheliga et al. 2022). General multisensory integration therefore makes simultaneous music and aroma conceptually defensible. It does **not** establish therapeutic synergy. Whether music plus aroma produces no incremental effect, additive benefit, interference, or an interaction exceeding their independent contributions requires direct experimental comparison.

This distinction also prevents an overly simple “**limbic system**” explanation. A common shorthand would suggest that music or smell stimulates the limbic system, the limbic system controls emotion, and relaxation consequently follows. The manuscript correctly rejects this account. Emotion involves distributed interactions among perceptual, attentional, mnemonic, reward, appraisal, interoceptive, regulatory, cortical, and subcortical processes; structures historically grouped as “limbic” neither constitute a unitary emotional system nor exhaust the neural basis of emotion. The present framework therefore invokes no master neural mechanism. Its explanatory level is a network of interacting processes whose relative contribution may differ across modalities, persons, and contexts.

Several processes may cut across that network. **Attention** changes object across stages—from bodily sensation during PMR, to internally generated representations during visualization, to potentially focal or background auditory and olfactory input during Stage III. More attention is not necessarily better: effortful imagery may increase cognitive load, while continuous monitoring of music or aroma may interfere with relaxation. **Memory** similarly links imagery, music, and olfaction, but can facilitate or disrupt relaxation depending on what is retrieved. **Appraisal and expectancy** matter because participants encounter intervention cues as meaningful: music may be judged comforting or inappropriate, an aroma pleasant or medicinal, and imagery reassuring or artificial. Such processes should not be dismissed simply as “placebo”; they form part of the psychological conditions under which interventions are experienced.

A further candidate mechanism is **perceived cross-modal congruence**. Calm imagery accompanied by personally compatible music and a positively evaluated aroma may produce a more coherent experience than imagery paired with emotionally conflicting or aversive sensory cues. Yet even this intuitively attractive proposition remains hypothetical. Congruence is partly subjective, and maximal congruence need not always be beneficial. The empirically defensible hypothesis is narrower: **perceived congruence may moderate affective engagement and relaxation outcomes**.

The framework can therefore distinguish three levels of mechanistic confidence. **Relatively well-supported relationships** include PMR with muscular awareness and release; imagery with affect and memory; music with affect and memory; olfaction with affect and memory; and multisensory integration as a general neurocognitive phenomenon. **Synthesized bridges** include PMR-related attentional settling as potentially favourable to imagery, imagery as a possible affective

context for later sensory engagement, learned associations across repeated multimodal practice, and perceived congruence as a possible organizer of experience. **Open hypotheses** include whether PMR specifically improves visualization, whether music or aroma reinforces preceding imagery, whether music and aroma produce additive or synergistic therapeutic benefit, whether the complete configuration outperforms simpler combinations, and whether the proposed ordering is superior to alternatives.

The mechanistic contribution of the framework is consequently **not the discovery of one biological pathway linking four modalities**. It is the identification of a partially supported network in which somatic state, attention, imagery, affect, memory, appraisal, audition, olfaction, and multisensory processing can interact, while the therapeutic consequences of integrating those processes remain open to testing.

The central proposition can therefore be stated precisely:

The framework is a sequentially organized intervention operating within a distributed and reciprocal network of somatic, attentional, imaginal, affective, mnemonic, auditory, olfactory, and multisensory processes. Several constituent relationships are empirically supported; the cross-stage bridges and therapeutic consequences produced by their integration are not yet established.

This network account leads directly to a further implication. If imagery, music, and odour acquire different meanings across individuals, and if attention, memory, appraisal, and congruence can alter their effects, then mechanism cannot be separated from the person and context in which the intervention occurs. That problem is the subject of §9.

Individual Differences, Personalization, and Context

The mechanisms discussed in §8 imply that variation in response is not merely statistical noise surrounding an otherwise uniform intervention. PMR, imagery, music, and aroma are experienced through differences in bodily awareness, cognitive capacities, sensory processing, learning history, preference, memory, expectancy, and context. Consequently, the same nominal protocol can constitute a substantially different psychological experience for different participants. Individual variability is therefore **mechanistically constitutive of the framework**, not simply a limitation to be acknowledged after intervention design.

Three domains are especially relevant: **participant capacities, preferences and learned meanings, and situational/contextual conditions**.

Participant Capacities

The first domain concerns capacities that influence how participants engage particular modalities. PMR requires some degree of attention to bodily sensation and muscular change, but individuals differ in interoceptive and somatic awareness. Creative visualization presents an even clearer example: imagery vividness varies considerably, and some individuals report little or no voluntary visual imagery. Low vividness, however, should not automatically be equated with inability to benefit from imagery-related procedures; imagery can vary across sensory modalities, and subjective vividness is not identical to therapeutic responsiveness.

Sensory sensitivity also matters at Stage III. Auditory intensity that is unobtrusive for one participant may be distracting or uncomfortable for another, while an odour experienced as mild by one person may be overpowering or aversive to another. Such variation cautions against defining successful implementation solely by standardized stimulus parameters.

Preferences and Learned Meanings

The second domain concerns the meanings participants bring to intervention stimuli. Music is especially dependent upon **preference, familiarity, cultural learning, and autobiographical association**. A piece conventionally described as relaxing may evoke comfort for one listener, boredom for another, and sadness or distress for someone who associates it with a particular event. Its intervention effect therefore cannot be inferred solely from acoustic characteristics.

Olfactory experience is similarly shaped by **odour preference and associative learning**. Odours can acquire positive or negative significance through prior encounters and can evoke autobiographical memories. An aroma selected because previous studies associate it with reduced anxiety may consequently fail to relax a participant who dislikes it or associates it with illness, bereavement, ritual, work, or another personally salient context. The psychological meaning of an odour cannot be reduced to the presumed properties of the essential oil itself.

Imagery content is likewise interpreted through personal and cultural experience. Images of light, nature, warmth, spaciousness, or safety need not carry equivalent meanings for everyone. Personalization therefore concerns not merely choosing a preferred song or aroma but recognizing that **stimulus meaning is partly learned and person-dependent**.

Situational and Contextual Conditions

A third source of variability lies in the circumstances under which the intervention occurs. Expectancy, previous experience with relaxation practices, current emotional state, fatigue, perceived safety, environmental noise, privacy, practitioner behaviour, and the broader social setting may alter engagement. A participant who approaches the intervention voluntarily in a quiet environment may experience the same instructions differently from someone who feels observed, pressured, distracted, or uncertain about the procedure.

Context may also change within the same person. A musical selection, image, or aroma that supports relaxation on one occasion may be ineffective or unwelcome on another because mood, memory accessibility, physical condition, or attentional demands have changed. Personalization should therefore not be understood as the discovery of a permanently optimal stimulus profile.

These considerations can be summarized as:

Intervention × Person × Context → Experienced Intervention

The formula does not imply that every intervention must be redesigned completely for every participant. Unlimited customization would undermine standardization, replicability, and the ability to determine which components produce observed outcomes. The more defensible principle is **stable architecture + adaptable implementation**. The

functional structure—somatic regulation, cognitive-imaginal regulation, and optional sensory-affective engagement—can remain stable while selected implementation features, such as imagery content, music choice, aroma inclusion, sensory intensity, or omission of an unsuitable component, are adapted within predefined boundaries.

Personalization is therefore neither an optional embellishment nor evidence that “anything works for someone.” It is itself an empirical proposition. Research should test whether participant capacities, preferences, associations, and contextual variables **moderate** outcomes and whether bounded personalization improves engagement or benefit relative to standardized delivery. The framework thereby shifts the question from whether the four-modality protocol “works” in the abstract to a more precise question: **which configuration is experienced as workable by which participants, under which conditions?**

This conclusion also has a safety implication. If a nominally relaxing stimulus can become aversive through sensory sensitivity, memory, preference, or context, participants must be able to modify or discontinue components rather than being required to complete the maximum configuration. The clinical and methodological safeguards required by that principle are addressed in §10.

Clinical, Safety, Conceptual, and Methodological Qualifications

An integrated relaxation framework should be judged not only by whether its components are individually plausible or beneficial, but also by whether their combined use remains clinically bounded, safe, interpretable, and methodologically testable. The present model is therefore subject to five safeguards: **clinical boundary and complementarity; modality-specific safety and participant agency; multimodal burden and parsimony; attribution and research-design limitations; and claim discipline.**

Clinical Boundary and Complementarity

The framework is intended principally for **relaxation, stress-management, and psychophysiological well-being**, not as an independently validated treatment for diagnosed psychiatric or medical disorders. Evidence that PMR, guided imagery, music therapy, or inhalational aromatherapy may improve particular symptoms in particular populations does not establish that the integrated four-modality framework can treat anxiety disorders, depression, trauma-related disorders, chronic pain conditions, insomnia, or other clinical diagnoses.

Its proper status is therefore **complementary rather than substitutive**. Where medical, psychological, psychiatric, rehabilitative, or other professional care is indicated, the framework should not be presented as a replacement. Stronger clinical claims require condition-specific evidence and appropriately qualified delivery.

Modality-Specific Safety and Participant Agency

Each modality carries a different risk profile. PMR is generally low risk, but deliberate muscular contraction may require adaptation for pain, musculoskeletal injury, postoperative limitation, or other physical vulnerability. Bodily attention itself may also be uncomfortable for some participants. Modified PMR should therefore

emphasize comfortable rather than forceful muscular engagement.

Creative visualization can evoke unintended emotional or autobiographical material. Imagery intended to be calming may produce distress, grief, intrusive memories, or unwanted symbolic associations. Participants should be able to modify, replace, or discontinue imagery rather than being encouraged to persist through distress. Symbolic “healing” imagery must also remain distinct from biomedical claims: imagining restorative light does not establish tissue repair, disease treatment, or other physiological healing.

Music may likewise evoke unwanted affect or memory, and excessive auditory intensity is unnecessary for relaxation-oriented use. Comfortable listening levels and the ability to reduce or discontinue the auditory component should therefore be maintained.

Aromatherapy requires proportionately greater caution. Essential oils should not be treated as risk-free because they are plant-derived. Even inhalational use may produce headache, coughing, irritation, nausea, sensory aversion, or unwanted emotional associations in susceptible individuals, while topical and oral routes introduce additional safety concerns beyond the operative scope of this framework. The model therefore does not prescribe particular oils, concentrations, blends, or exposure durations. Where pregnancy, respiratory sensitivity, allergy history, medication use, or other relevant medical vulnerability raises uncertainty, product- and population-specific professional guidance should take precedence.

Across all four modalities, **participant agency is a central safeguard**. Components should remain modifiable, optional, and discontinuable when discomfort occurs.

Multimodal Burden and Parsimony

Combining individually tolerable interventions does not guarantee that the combination will remain tolerable or beneficial. A participant may simultaneously encounter bodily instructions, breathing cues, imagery, music, aroma, facilitator voice, and expectations about relaxation. Additional components can therefore increase cognitive load, sensory burden, distraction, or fatigue.

The framework consequently adopts **multimodal parsimony**:

More modalities should not be assumed to produce better outcomes.

The fullest four-modality configuration represents a maximum implementation, not the obligatory form of the model. A simpler configuration should be preferred where additional components provide no demonstrable incremental benefit or introduce avoidable burden.

Attribution, Controls, Blinding, and Reporting

The principal methodological difficulty of a multimodal intervention is **causal attribution**. If participants improve after PMR, visualization, music, and aroma, the improvement cannot automatically be assigned to any one component, their sequence, or their interaction. Quiet rest, expectancy, practitioner attention, passage of time, preference, or other nonspecific factors may also contribute.

Future research therefore requires designs capable of separating questions. Dismantling or factorial comparisons can test whether visualization adds to PMR, whether music or aroma contributes incrementally, and whether their combination produces an interaction rather than simple coexistence. Likewise, evidence that one sequence produces benefit does not establish that the sequence itself is optimal unless alternative orders are compared directly.

Blinding presents unavoidable limits. Participants generally know whether they are performing PMR, imagining content, hearing music, or smelling an aroma, and practitioners may know assigned conditions. Rigour must therefore rely on alternative safeguards such as concealed allocation where feasible, blinded outcome assessment, credible control conditions, preregistration, standardized intervention descriptions, expectancy assessment, and transparent analysis.

Reporting also requires specificity. Labels such as *PMR*, *guided imagery*, *music intervention*, or *aromatherapy* are insufficient without details concerning procedure, duration, delivery, personalization, music selection and volume, aroma identity and route, sequence, facilitator role, adherence, and adverse events.

Claim Discipline and Evidentiary Non-Transferability

Finally, the framework must preserve the evidentiary rules established in §2. Evidence supporting an individual modality does not validate the complete protocol; general multisensory integration does not establish therapeutic music–aroma synergy; subjective improvement does not necessarily imply corresponding physiological change; and acute relaxation does not demonstrate durable therapeutic benefit.

The framework therefore does **not** claim that the four modalities work for every participant, that they operate through one biological mechanism, that PMR has been shown to enhance visualization, that music and aromatherapy are synergistic, that four modalities are superior to fewer, or that the proposed order is optimal. Nor does it claim that the complete framework has already been clinically validated.

Its defensible claim is narrower: the four modalities can be integrated into a coherent, testable architecture while maintaining clear distinctions among **component evidence, synthesized organization, and hypotheses requiring direct validation**.

These safeguards define the conditions under which the model remains scientifically responsible: **bounded clinical purpose, modality-specific safety, participant agency, multimodal parsimony, methodological transparency, and disciplined claims**.

Discussion: Toward an Integrated Model of Multimodal Relaxation

The principal contribution of the proposed framework lies not in assembling four familiar relaxation-oriented modalities, but in specifying **how they can be related without assuming that combination itself constitutes therapeutic advancement**. PMR, creative visualization, music-based intervention, and inhalational aromatherapy already possess distinct literatures. What has been missing is a sufficiently bounded model that differentiates their functional roles, organizes their possible integration, and simultaneously preserves the evidentiary distinction between what is known about

individual components and what remains to be demonstrated about their combination. The resulting framework should therefore be understood primarily as a **theoretical and hypothesis-generating model**, not as a validated composite therapy.

What Integration Adds

Integration offers an analytical advantage over treating relaxation as a single undifferentiated response or presenting several techniques as an interchangeable menu. The three-stage architecture distinguishes **somatic regulation, cognitive-imaginal regulation, and sensory-affective engagement**, while the four modalities preserve differences in how those functions are operationalized. This makes it possible to ask not merely whether a multimodal intervention “works,” but **which component contributes what, whether its position matters, and whether particular combinations alter outcomes**.

The framework also separates **intervention architecture from mechanism**. A sequential delivery structure need not imply a linear psychological process. This allows the model to remain practically organized while accommodating the reciprocal relations among bodily state, attention, imagery, affect, memory, appraisal, audition, and olfaction developed in §8. Integration consequently produces a researchable architecture without requiring a reductive theory of mind–body causation.

A further gain is that the framework makes **component relationships explicit**. PMR → imagery is identified as a synthesized transition rather than an established causal bridge; music and aroma are parallel rather than arbitrarily ordered; and multisensory combination is distinguished from demonstrated therapeutic synergy. The model therefore gains explanatory structure precisely by refusing to convert conceptual coherence into evidentiary certainty.

Integration and the Risk of Multimodal Excess

The same feature that makes multimodal intervention attractive can also become its principal weakness. Adding modalities may create an impression of comprehensiveness while increasing cognitive load, sensory burden, procedural complexity, implementation costs, and difficulty of causal attribution. A four-component intervention that performs better than no intervention would still leave unanswered whether all four components were necessary.

This problem can be described as **multimodal excess**: the inclusion of components because they appear complementary rather than because their incremental contribution has been demonstrated. The appropriate counterprinciple is **multimodal parsimony**. Complexity should be retained only when it contributes something that a simpler configuration does not.

The full PMR → visualization → music/aroma architecture should therefore be regarded as a **maximum testable configuration**, not the preferred intervention by default. If PMR plus visualization produces outcomes comparable to the complete model, the additional sensory components may be unnecessary for that population and outcome. If music contributes but aroma does not, Stage III-B can be omitted. Conversely, if a participant finds music distracting but benefits from olfactory input, the parallel structure of Stage III permits aroma without music. The architecture becomes

stronger, rather than weaker, when unnecessary components can be removed.

Modularity, Personalization, and Parsimony

Modularity also provides a way to reconcile personalization with scientific standardization. The framework need not choose between a rigid identical protocol and unrestricted individual customization. Instead, it can retain **stable functional architecture with bounded adaptability**.

This matters because personalization introduces a methodological tension. Participant-selected music or aroma may improve acceptability and congruence, but increasing personalization can also make interventions harder to reproduce and compare. The relevant question is therefore not whether personalization is universally desirable, but **which intervention parameters should remain fixed and which may vary without changing the identity of the intervention**.

Future protocols might, for example, standardize stage order and duration while permitting selection from predefined music or aroma options; compare standardized with preference-based conditions; or omit a sensory component when screening identifies aversion. Such designs would allow personalization itself to become an experimentally testable variable rather than an uncontrolled source of heterogeneity.

This yields a broader principle:

The most effective multimodal intervention may not be the one containing the most modalities, but the simplest configuration that provides sufficient benefit for a particular person, purpose, and context.

In this sense, *holistic* adds little explanatory precision. The analytically useful concepts are **multimodal, multisensory, modular, personalizable, and parsimonious**.

From Framework to Empirical Research Programme

The model's scientific value ultimately depends upon whether it generates propositions capable of being supported, revised, or rejected. Several research strategies follow directly from its architecture.

First, **dismantling designs** can estimate component contribution. Researchers could compare PMR alone with PMR + visualization and then with configurations adding music, aroma, or both. **Factorial designs** could examine auditory and olfactory components independently and jointly, allowing genuine interaction effects to be distinguished from simple additive improvement.

Second, **sequencing studies** are required because the proposed PMR → visualization → sensory-affective order remains synthesized. Comparing the proposed sequence with alternative orders, simultaneous presentation, or isolated components would test whether sequencing contributes anything beyond component exposure.

Third, **mechanism-focused studies** can examine whether changes in muscular tension, imagery engagement, affect, attention, expectancy, perceived congruence, or other candidate processes mediate outcomes. This is particularly important for preventing mechanism from being inferred retrospectively merely because an intervention produced benefit.

Fourth, **moderation studies** can test the personalization claims developed in §9. Imagery ability, sensory sensitivity, music and odour preference, autobiographical association, expectancy, prior experience, and contextual variables can be examined as moderators rather than treated solely as nuisance variance.

Finally, studies should measure more than immediate self-reported relaxation. Outcomes may include subjective stress or anxiety, affect, physiological indicators where appropriate, adherence, acceptability, adverse experiences, persistence of effects, and intervention burden. Divergence among these outcomes would itself be theoretically informative.

Falsifiability and Theoretical Status

The framework should be revised if its central propositions fail. If PMR before imagery provides no advantage over other arrangements, the proposed sequencing rationale should be weakened. If Stage III components add no meaningful benefit, they should not be retained merely to preserve the four-modality model. If music and aroma interfere rather than cooperate, multisensory combination should be restricted. If personalization does not improve outcomes or introduces unacceptable variability, its role should likewise be reconsidered.

Negative and null findings are therefore not threats to the framework but tests of whether its architecture deserves to survive.

The article's contribution is consequently best understood as **structured integration under evidentiary constraint**. It transforms four partially separate intervention domains into a modular set of empirically separable propositions while refusing to claim that their combination has already been validated. Its strongest research question is not whether a four-modality protocol works, but:

Does organizing relaxation through somatic regulation, cognitive-imaginal regulation, and optional multisensory-affective engagement provide meaningful benefit beyond simpler component interventions—and, if so, for whom, under what conditions, through which components, and in what sequence?

Conclusion

Relaxation-oriented interventions are frequently examined as separate techniques, even though relaxation itself can involve interacting somatic, cognitive, imaginal, affective, mnemonic, and sensory processes. This article has addressed that fragmentation by developing an integrated framework for four modalities—**progressive muscle relaxation (PMR), creative visualization, music-based intervention, and inhalational aromatherapy**—while resisting the assumption that combining individually plausible interventions necessarily produces a superior therapy.

The resulting model organizes four modalities into **three functional stages**:

Stage I — Somatic Regulation: Progressive Muscle Relaxation

Stage II — Cognitive-Imaginal Regulation: Creative Visualization

Stage III — Multisensory-Affective Engagement:

Music-Based Intervention and/or Inhalational Aromatherapy

The architecture therefore proposes a progression from **body** → **imagination** → **multisensory-affective experience**, with music and aromatherapy functioning as parallel and optional auditory and olfactory pathways rather than as separate sequential stages. This organization is deliberately modular: the complete four-modality configuration represents a maximum testable architecture, not a requirement that every participant receive every component.

The framework also maintains a crucial distinction between **empirical foundations and theoretical integration**. Evidence supports the relevance of the individual modalities and several constituent relationships, particularly imagery-affect, music-affect, olfaction-emotion/memory, and multisensory processing. The specific three-stage sequence, however, is a **synthesized architecture**, not an established therapeutic order. Whether PMR facilitates subsequent imagery, whether later sensory engagement reinforces preceding stages, whether music and aroma produce additive or synergistic effects, and whether the complete configuration outperforms simpler alternatives remain empirical questions.

Two principles consequently constrain application of the model. **Personalization** recognizes that capacities, preferences, learned associations, sensory sensitivities, and contexts can alter the experienced intervention. **Multimodal parsimony** requires that additional components earn their place through demonstrable contribution rather than through an assumption that greater complexity is inherently more holistic or effective.

The framework should therefore be evaluated not by asking simply whether four relaxation modalities “work together,” but by determining whether their organization provides benefits beyond simpler interventions. Its central research proposition is:

Does organizing relaxation through somatic regulation, cognitive-imaginal regulation, and optional multisensory-affective engagement provide meaningful benefit beyond simpler component interventions—and, if so, for whom, under what conditions, through which components, and in what sequence?

That question converts the proposed architecture from an assertion of therapeutic integration into a **testable programme of multimodal relaxation research**.

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