

Somatic Practices for Neurodivergent Singers

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Component 1: Project Portfolio

1.1 Introduction

As a vocal artist and music educator with eleven years of experience in K-12 and studio settings, and as someone who has received an autism and ADHD combined diagnosis in 2025, I have become increasingly aware of a gap between what conventional vocal pedagogy asks of the body and what my body (and the bodies of many of my neurodivergent students) reliably delivers. Interoceptive and proprioceptive processing differences documented in autism and ADHD mean that the “body-as-instrument” is not always legible from within. Signals of tension, breath, and resonance that neurotypical singers may access relatively automatically must, for neurodivergent practitioners, be deliberately cultivated (Mahler 2017; Moseley, Huggett, & Murphy, 2023). This is the call. The problem is practical and personal daily vocal practice. As currently structured in the conventional pedagogy often proceeds from the assumption of reliable bodily self-awareness. This assumption does not hold for me and that I suspect, does not hold for a significant number of my students.

The response to this call is the development of a structured somatic vocal warmup sequence designed as an artifact for personal daily practice and prototyped through iterative self inquiry. The artifact is a progressive, sensation centered sequence of embodied exercises. It moves from gravitational grounding through breath arrival, to resonance mapping, and integration. Its intended primary user is myself. Its secondary application is adaptation for neurodivergent students in my teaching contexts. Crucially, this project is exploratory. I am investigating whether and to what extent this approach may work. Not asserting it in advance that it does.

Within the wider vocal pedagogy literature, neurodivergent singers are rarely addressed explicitly, and some somatic approaches are typically normed on neurotypical sensory processing. This project hopes to occupy that gap at the intersection of disability-informed pedagogy and daily vocal practice.

1.2 Planned Program of Study

Theoretical Influences

The theoretical foundations of this project sit at the intersection of interoceptive neuroscience, somatic pedagogy and neurodivergent embodiment. Craig's (2015) neurobiological account of the insular cortex as the anatomical site of interoceptive processing provides the foundational scientific rationale. Craig claims that this felt sense of being in the body (hunger, tension, vibration and breath) is generated by a specific neural pathway and its availability varies across individuals and neurotypes. Building on this Garfinkel & Critchley (2016) propose a three-fold model of interoception (accuracy,

sensibility, and metacognitive awareness) that offers a useful framework for understanding where in that chain neurodivergent singers may experience difficulty.

Robertson and Baron-Cohen's (2017) review of sensory perception in autism establishes that sensory processing differences are core to the condition and extend across all sensory modalities, including proprioception and interoception. Serra and Minderaa (2018) document specific proprioceptive and motor planning deficits in ASD. Mosley, Huggett, and Murphy (2023) provide the most recent meta-analytic synthesis, finding that autistic individuals show reduced interoceptive accuracy, alongside inflated confidence in their bodily self-reports. This discrepancy may have direct implications for self-monitoring in performance.

From the pedagogical tradition, Thurman and Welch (2020) provide the foundational body-mind framework in voice education, arguing that vocal production is an inseparable body-mind phenomenon. LoVetri (2019) situates this within a functional somatic approach to contemporary commercial music singing, while Elmer and Lienhard (2018) supply the cognitive science rationale for embodied music learning.

Best Practice Influences

Best practice for this project is drawn from both peer-reviewed pedagogical literature, and Gray literature. The latter was examined critically for validity, bias, and relevance.

Among peer-reviewed sources, Brunkan (2016) provides empirical evidence that body awareness exercises measurably reduced singer tension in choral context. Schlinger

(2020) offers applied methodology for somatic vocal integration, drawing on Feldenkrais and body-mind centering traditions. Weiss et al. (2018), and Yeh et al. (2020) provide systematic review evidence that mindfulness and yoga based interventions, (both body attuned practices closely related to somatic training yield positive outcomes for autistic individuals in both regulation, and wellbeing. However, both reviews also note significant methodological limitations in the current evidence base.

Gray literature sources include Mahler (2017) a practitioner text published by AAPC Publishing specifically for autism professionals. While not peer-reviewed in the conventional sense, Mahler's interoception curriculum is widely cited in clinical and educational ASD practice, and is underpinned by the neuroscience reviewed above. It is treated here as applied practitioner literature rather than empirical evidence. The Autism Awareness Centre (2019) and Bristol Autism Support (2022) websites are used to contextualize practitioner understanding of interoceptive and proprioceptive challenges. Both are non-commercial community focused organizations with a degree of institutional credibility, though they lack editorial, peer review and are cited accordingly.

Somatic Therapy Partners (2026) and The Atypical View (2025) are acknowledged as more commercially or community situated sources. Somatic Therapy Partners is a private clinical practice whose websites serve as a marketing function, introducing potential confirmation bias. It is used only for contextual illustration, not as evidentiary support. The Atypical View is a blog written by and for neurodivergent people, and is treated as “lived experience” literature, valuable for authenticity and resonance, but not

as empirical or clinical evidence. LoVetri's Somatic Voice Work is a commercial pedagogical method. As LoVetri has published fifteen peer-reviewed articles in *Journal of Voice* and *Journal of Singing*, the method is critiqued through the lens of its published research rather than commercial framing.

Methodological Influences

This project adopts a practice-as-research approach (Nelson 2022) within an interpretivist autoethnographic paradigm. A fuller discussion follows in section 1.3.

Aims and Objectives

Aim: To investigate whether a structured somatic-informed daily vocal warmup sequence can improve my experience of body awareness, vocal readiness, and tension management as neurodivergent singer-practitioner, and to develop a replicable artifact that may be adapted for use with students across the neurological spectrum.

Objectives:

1. *By the end of week 2:* complete a critical literature mapping of interoceptive and somatic vocal research, identifying key theoretical and best practice sources (specific, measurable, achievable, relevant, and time bound).
2. *By the end of week 4:* design a first iteration of the somatic warmup sequence, documented with written exercise descriptions, theoretical rationale per exercise, and intended sensory focus.

3. *By the end of week 8:* pilot the sequence across a minimum of four weeks of daily practice, maintaining a structured reflective log, with observations per session on body awareness, vocal quality, and tension levels.
4. *By the end of week 10:* critically evaluate the sequence against stated aims using reflective log data and self-assessment against predefined markers revised the artifact accordingly.
5. *By the end of week 12:* produce the final artifact in a format suitable for adaptation for student use with accompanying teaching notes.

Expected Learning Outcomes

By the end of this project, I expect to:

- Develop a theoretically, grounded practical understanding of interoceptive and somatic approaches to vocal warmup that I can articulate and defend in academic writing.
- Build a personal evidence base through documented daily practice for evaluating the impact of somatic exercises on my own vocal readiness and neurodivergent body awareness.
- Produce an artifact that is usable, reflectively, evaluated and transferable to my teaching contacts with appropriate adaptation.
- Deepen, my understanding of the relationship between neurodivergent embodiment and vocal pedagogy, and identify where further research or professional development is needed.

Assessment Criteria

Success in this project will be measured across two domains:

Process domain: Was the planned program of study followed? Is there documented evidence of iterative development (reflective log, exercise revisions, critical notes)? Has Gray literature been scrutinized appropriately? Are aims and objectives addressed explicitly in the final right up?

Efficacy domain: Does the artifact, as evaluated through the reflective log and self assessment, demonstrate any observable change in my experience of body awareness, tension management or vocal readiness? Are limitations and inconclusive findings acknowledged honestly? Is there a grounded basis for claims about potential transferability to students without overstating what a single practitioner pilot can establish?

Ethics

As the sole participant in this study, the primary ethical consideration is reflexivity. I must be transparent about the dual role of researcher and researched, and guard against confirmation bias. In interpreting my own reflective data, I will not make claims on behalf of my students without their consent. And any future adaptation of this artifact for student use will be subject to appropriate institutional ethics. Procedures.

Piepzna-Samarasinha (2018) offers a useful orienting framework here. The project must not position neurodivergent embodiment as a deficit to be corrected. But as a different and valid way of inhabiting a body that may require different pedagogical scaffolding.

Timeline

Phase	Activities	Weeks
Phase 1: Literature & Design	Critical literature mapping; source scrutiny; first iteration of artefact design	Weeks 1–4
Phase 2: Piloting	Daily somatic practice; structured reflective log (minimum 3 observations per session); mid-point check against objectives	Weeks 5–8
Phase 3: Evaluation & Revision	Analysis of reflective log; artefact revision; self-assessment against efficacy and process criteria	Weeks 9–10
Phase 4: Write-up & Finalisation	Final artefact production; Component 2 write-up; teaching notes for student adaptation	Weeks 11–12

1.3 Methodology

This project is situated within a Practice-as-Research (PaR) methodology, as defined and developed by Nelson (2022) PaR holds that creative and professional practice itself

can constitute a rigorous mode of inquiry, generating knowledge that is tacit, embodied and experiential in ways that conventional observational or experimental research cannot fully capture. Nelson's framework identifies three intersecting knowledge types: *know that* (propositional, literature based knowledge), *know how* (tacit, skill based knowledge embedded in practice), and *know what* (evaluative knowledge emerging from critical reflection on the practice). This project engages all three. The literature review develops *know that*, the daily warmth practice develops *know how*, and the structured reflective log generates *know what* through iterative self inquiry.

The epistemological paradigm is interpretivist, with an autoethnographic orientation. Autoethnography, the systematic use of self as research subject, is appropriate here for several reasons. As a late diagnosed, AuDHD practitioner investigating a problem grounded in my own embodied experience, the boundary between researcher and participant is not a methodological weakness to be managed, but a productive transparency to be acknowledged. My lived experience of the interoceptive and proprioceptive challenges described in the literature is both the motivating rationale for the project and a form of contextual expertise.

Literature Review Approach: A selective, theoretically guided literature review was conducted rather than a systematic or scoping review, as the goal was theoretical framing for artifact development, rather than exhaustive evidence synthesis. Key search terms included *interoception and autism*, *proprioception and ASD*, *somatic vocal pedagogy*, *embodied music cognition*, *neurodivergent and singing*, *mindfulness and*

autism intervention. Databases searched include Google Scholar, PubMed, JSTOR, and the RILM Abstracts of Music Literature. A date range preference of 2007 to 2026 was applied with earlier sources included where they represent foundational or canonical contributions. For example, Craig (2015) and Miller et al. (2007). Inclusion criteria: Peer-reviewed articles and scholarly monographs, addressing interoception, somatic pedagogy, neurodivergent embodiment, or vocal pedagogy. Gray literature was included where it represented established practitioner frameworks (Mahler, 2017) or contextual illustration (Autism Awareness Center 2019), with explicit acknowledgment of its non peer-reviewed status and scrutiny of source bias, as detailed in section 1.2.

Exclusion criteria were applied with equal intentionality. Sources were excluded where they were addressed vocal pedagogy without any engagement with embodiment, somatic awareness, or neurodivergent experience, as these fell outside the theoretical scope of the artifact's design. General music education literature not pertaining to body-based or sensory approaches was likewise excluded to maintain focus and avoid diluting the theoretical framework. Studies relying solely on neurotypical populations without acknowledgment of neurological diversity were excluded from the core evidence base, though they are occasionally referenced for contextual contrast. Popular press and self-help literature on mindfulness or vocal health were excluded entirely as they lack the methodological transparency required for academic evidentiary use. However, practitioner oriented sources were included. This was explicitly justified as detailed in section 1.2.

Artefact Development Approach: The warm up sequence will be developed iteratively. Across the pilot phase, each iteration will be documented in a structured reflective log recording observations across three dimensions. Number one: felt bodily awareness before and after the sequence. Number two: perceived vocal readiness. Number three: notes on which exercises felt most and least accessible on that day. This log will serve as both evidence of embodied practice in the appendix, and as primary data for the critical evaluation in Component 2. Revisions to the sequence will be tracked with version notes, so the development process is legible, and not retrospectively smoothed.

Limitations and Reflexivity: Single practitioner PaR cannot produce generalisable findings. The reflective log is subject to recall bias and the intrinsic limitations of self-report, particularly given the interoceptive accuracy discrepancies documented in autistic adults (Moseley, Huggett & Murphy, 2023). These limitations are not reasons to abandon the methodology. They are conditions to be named, managed, and reflected upon explicitly in the final evaluation. The goal is not to prove that this sequence works universally, but to investigate the extent to which it may work for this practitioner, and to develop a theoretically grounded artifact that others may then test and adapt.

Component 2: Project Report

This report first outlines the context and justification for the study. Then, it evaluates the somatic warm artifact through Nelson's know-that, know-how, and know-what

framework, before offering a Kolb informed reflection on the project's implications for the author's future practice as a neurodivergent singer.

Introduction

Context for the study

This project centers on the development and evaluation of a structured somatic vocal warm up sequence, intended to support singers across the neurological spectrum with particular relevance to neurodivergent embodiment and daily vocal practice. The portfolio identifies a central pedagogical problem: conventional vocal pedagogy often assumes that singers can readily perceive and interpret bodily signals such as tension, breath, alignment, and resonance. Yet this assumption does not necessarily hold for autistic and ADHD singers whose interceptive and proprioceptive processing may differ from neurotypical norms. Within this context, the artifact was designed not simply as a set of vocal exercises, but as an exploratory response to a mismatch between pedagogical expectation and embodied reality.

The significance of the study lies in its effort to make vocal preparation more accessible by sequencing sensation before technical demand. Rather than beginning with correction, pitch accuracy, or abstract imagery, the artifact moves through grounding, breath arrival, resonance, mapping, and integration. The sequence reflects an underlying commitment to the idea that some singers may need to establish body orientation before they can engage efficiently with more conventional vocal tasks. The

project therefore, addresses a meaningful gap between what voice teaching, often presumes, and what some singers may actually experience in practice.

That gap also became visible through the reflective findings emerging from the pilot phase. The warmup appeared to support noticeable improvement in posturing, balance, and the sense of body in space. This suggests that the grounding elements were not only theoretically justified, but practically useful at the same time. The practice also exposed important constraints. When emotional arousal was already high, completing every segment was not always possible, and the body scan and rescan phases could intensify frustration rather than regulate it. In addition, during periods of illness or allergies, sensory feedback shifted and resonance was not perceived in the same places. These reflections matter because they show that the artifacts value lies not in uniform success, but more in the nuanced insight it offers into how bodily state alters vocal accessibility for the practitioner researcher, whose body is both the site of experimentation and the source of reflective data.

Throughout the project, the same individual functions as researcher, developer, and soul participant. The warm up sequence was created for the author's own daily vocal practice as an AuDHD singer-practitioner and its effects were examined through structured reflective logging, iterative versioning, and critical engagement with the literature. This dual position is not treated as a methodological flaw to be erased, but as a defining feature of the study's auto ethnographic design.

Justification for the study

The study is justified by the convergence of interoceptive neuroscience, somatic pedagogy, and neurodivergent embodiment, as presented in the portfolio. The theoretical rationale begins with Craig's account of interoceptive processing and Garfinkel & Critchley's distinctions amongst interoceptive accuracy, sensibility, and awareness. Together these offer a language for understanding why bodily signals may become difficult to access, interpret, or trust consistently. Robertson & Baron Cohen, Serra & Minderaa, and Moseley, Huggett, & Murphy further support the view that sensory processing differences are central rather than incidental to autism related embodiment. This body of literature provides a strong basis for challenging pedagogical approaches that rely on immediate body legibility.

The project is also justified by pedagogical and best practice literature on embodied voice work. Thurman & Welch frame voice as an inseparable body-mind phenomenon, while LoVetri, Schlinger, Brunkan, and Elmer & Lienhard collectively support the inclusion of tactile, embodied and body-aware approaches in singing pedagogy. The portfolio also makes careful use of gray literature, particularly Mahler's interception framework, while explicitly acknowledging differences in evidentiary weight and possible source bias. This critical handling of sources strengthens the project, because it shows that the artifact is not built on advocacy alone, but on selective and reflective synthesis.

Methodologically, the project is well justified as practice-as-research within an interpretivist autoethnographic framework. The author is both the singer whose body is

prepared by the warmup and the analyst who interprets the resulting experiences. So the study treats this dual role as a methodological feature rather than a weakness to be concealed. Since the artifact concerns a practical and embodied process that emerged from a lived experience, the use of reflective logging, and iterative design is more appropriate than a detached experimental model. The reflective findings from the pilot phase further confirms this rationale. The sequence did not function identically across all emotional and physical states, and this variability is precisely the kind of situated knowledge that practices research is designed to capture. The study is therefore justified, not because it can establish universal proof but because it can generate critically examined, practice-grounded knowledge about what this artifact can and cannot do within the author's own embodied practice.

Aim and Objectives of the critical review

The primary aim of this critical review is to evaluate how effectively the somatic warmup artifact was informed by theory, embodied practice, and reflective inquiry, and to assess the extent to which it improved body awareness, vocal readiness, and tension management within the context of the neurodivergent singing practice.

The review was guided by 4 objectives:

- To examine how theoretical frameworks and best-practice literature shaped the artifacts design.
- To evaluate how embodied experimentation and reflective observation informed its refinement.

- To assess how factual and contextual knowledge influenced what the artifact includes and prioritizes.
- To identify the strengths, limitations and future implications of the project for vocal pedagogy and further research.

Critical Review

The critical review is structured through Nelson's categories of know-that know-how, and know-what, while retaining a reflective orientation that recognizes the fluid relationship among reading, making, and revising described in the project portfolio. These categories are treated as interconnected rather than isolated, since the artifact developed through their ongoing interaction.

Know-That: theory, frameworks, and best practice

The know-that dimension of the project is grounded in the proposition that singing depends on embodied awareness. Yet embodied awareness is neither uniform nor automatically available across all singers. This principle is central to the artifacts design and gives the project its conceptual clarity. The portfolio's use of interoceptive neuroscience is a persuasive theoretical foundation for questioning voice pedagogies that presume immediate access to bodily sensation. Craig's work on interoception, along with Garfinkel & Critchley's models of interoception processing together make it possible to understand body awareness as layered, variable, and partially mediated rather than transparent.

These frameworks clearly informed the artifact's structure. The sequence begins with grounding and proprioceptive orientation, then moves towards breath observation, exploratory voicing, tactile resonance mapping, and integrated phrase work. This order is not arbitrary. It reflects the view that sensory orientation may need to proceed technical demand, especially for singers whose internal body cues are not immediately stable or interpretable. As the artefact states in its Stage 1 rationale: *"The sequence reflects the neurological logic of interoceptive architecture by establishing the body's spatial and gravitational reality first. This should reduce the cognitive overhead of top-down instruction and allow sensation to guide the process (Craig, 2015; Garfinkle & Critchley, 2016)"* (Appendix A). The pilot reflections lend support to this design logic, since improved posture, balance, and a sense of body in space suggests that the grounding stages did create a more usable starting point for the singing practice.

The best-practice influences are also well aligned with the project's aims. Brunken's findings on body awareness and singer tension support the artifact's attention to bodily noticing. LoVetri's functional somatic approach, and Thurman & Welch's body-mind framework reinforce the use of tactile, sequential, and embodied procedures in vocal training. Schlinger's discussion of somatic integration in performance practice also supports the sequencing of movement, breath, and sound. The inclusion of mindfulness and yoga related literature in the portfolio also strengthens this argument that body-attuned methods may have regulatory value, even though the evidence base remains methodologically uneven. Ariculi, Emerson and Meins (2018) provide relevant context here, finding that autistic adults experience significantly elevated rates of

physical health challenges alongside psychological ones. This finding strengthens the rationale for designing vocal preparation around body variability rather than assuming a stable, neutral baseline.

A further strength is the portfolio's critical handling of gray literature. Mahler's interoception curriculum is used as applied practitioner literature rather than direct empirical proof, and community or commercial sources are clearly marked as contextual, rather than evidentiary. This matters because the field lacks a large body of research focused specifically on neurodivergent singers. The project therefore relies on interdisciplinary transfer, but does so transparently.

The know-that section also benefits from the project's ethical positioning. The portfolio explicitly resists treating neurodivergent embodiment as a deficit to be corrected, and instead frames it as a valid mode of bodily experience that may require different pedagogical scaffolding. This ethical position strengthens the theory, because it shapes how the literature is interpreted. Sandgren's (2018) interpretive phenomenological analysis of the lived body in professional singing is instructive here. Singers describe their instrument, not as an object to be controlled, but as a site of felt experience that mediates between intention and sound. This phenomenological framing, supports the artifact's refusal of a corrective model and reinforces the decision to begin with observation rather than demand. The artifact is not trying to normalize the singer's body into a standard pedagogical mold. It is instead trying to design a more accessible route into practice.

Even so, the theoretical basis has limits. The literature strongly supports attention to embodiment interoception and sensory processing, but the evidence connecting these concepts directly to a specific somatic vocal warmup for neurodivergent singers remains incomplete. The artifact is therefore best understood as theoretically coherent, and plausibly justified, rather than empirically confirmed. This limitation is not a failure of the study but does require restraint in evaluating the impact.

Know-How: procedural and embodied knowledge

The know-how dimension concerns how the artifact was actually shaped through procedural judgment, embodied trial, and reflective adaptation. Here the project's practical intelligence is especially visible, because the same practitioner-researcher designed the initial sequence, implemented it in daily use, and critically interpreted its effects. The sequence does not simply assemble familiar vocal exercises, it organizes them according to a particular sensory logic. Grounding precedes breath, breath precedes voice exploration, resonance mapping provides tactile feedback, and integration connects sensation with musically meaningful phrase work. This arrangement reflects a clear procedural hypothesis: the body may need orientation before it can respond productively to more conventional singing demands.

The piloting phase offers important evidence that this procedural design had practical value. Most notably, the sequence appeared to improve posturing, balance, and overall sense of the body in space. These changes suggest that the grounding and weight shift stages were not merely introductory, but functioned as effective points of access to

bodily organization in this practice. This is significant because it indicates that somatic preparation may improve readiness, even before obvious changes in vocal sound are analyzed.

At the same time, the reflective findings show that procedural success was partial and conditional, rather than universal. When emotionally keyed up, it was not always possible to complete every segment, and the body scan and rescan phases could produce further frustration. This is crucial evaluative insight. It suggests that an exercise design to facilitate awareness may become counterproductive when emotional arousal is already elevated. In other words, the same procedure can function as a scaffold or a stressor depending on the nervous system state. The artifacts closing stage asks the practitioner to *“return to standing stillness, complete a shortened body scan notice. What if anything has shifted since the opening body check”* (Appendix A). In practice this rescan, designed to consolidate somatic learning, became counterproductive on high arousal days by intensifying frustration rather than regulation. This finding directly challenges the procedural assumption embedded in the design and indicates that the rescan requires a conditional pathway, rather than fixed instruction. Kenny's (2011) account of performance anxiety is relevant to this point. Arousal and attentional focus interact in ways that can make inward monitoring amplify rather than reduce somatic distress. The body scan and rescan phases may have triggered precisely this dynamic on high arousal days, suggesting the need for contingency pathways. This does not invalidate the artifact, but it does challenge any assumption that reflective somatic tasks are inherently regulating.

The practical findings also complicate the resonance work in a useful way. During illness or allergy episodes, sensory feedback changed, and the resonance was not felt in the same places or in the same way. The Stage 2 Sighing Siren exercise instructs the singer to *“allow the voice to slide through a comfortable pitch range on an open bowel without aiming for any particular pitch. The purpose is not intonation, but sensation. Feel where the resonance lives in the body as the pitch changes”* (Appendix A). During those illness and allergy episodes, however, resonance was not felt in the same locations or the same way, revealing that the artifact's invitation to “feel where the resonance lives” implicitly assumes a stable bodily baseline that does not always hold. This observation is important because it reveals that resonance mapping is not a fixed bodily truth, but a context sensitive experience. It reinforces the need for the artifact to remain exploratory and responsive, especially when physical health alters the perception field.

These findings point toward specific revisions needed in procedural design. Because the author is both the subject and developer of the study, moments of difficulty within practice can be treated directly as design evidence, rather than as external non-compliance. The sequence may therefore need an adaptable pathway for high arousal days. Perhaps allowing shortened scans, omitting rescans, or having substitutions with less internal demanding grounding tasks. It may also need more explicit guidance that resonance sensations are expected to vary across days, especially when allergies congestion or illness affect the vocal tract. Such revisions

would not dilute the method, but instead would make it more faithful to the project's core commitment to responsive pedagogy.

The study's dual role design also creates identifiable limitations. Clark and Williamson (2011) note in their evaluation of mental skills training for musicians that self-report measures are particularly susceptible to demand characteristics, and self-enhancement bias, especially when the practitioner is also the evaluator. This concern applies directly here. The reflective log may capture what the author hoped or expected to experience as readily as what was genuinely felt, and this must be acknowledged as structural limitation rather than individual failing. Because the author is invested in the artifact's success and is also the person interpreting its effects, favorable readings of ambiguous experiences remain a possibility at the same time. This position gives access to fine-grained somatic, and affective information that would be difficult to obtain through brief external observation alone. The project therefore treats the author's dual role as a trade-off. It limits generalizability while enabling depth, and responds to that trade-off through reflexivity, modest claims, and explicit acknowledgment of bias.

The know-how section therefore demonstrates two things at once. First, the artifact embodies strong, procedural reasoning and a meaningful translation of theory into practice. Second, the pilot reflections show that somatic access is unstable and contingent, which means the warm up must remain flexible if it is to stay genuinely usable. That tension is not a weakness of the study. It is one of the most valuable findings.

Know What: factual and contextual knowledge

The know-what dimension examines the factual, conceptual, and contextual knowledge embedded in the artifact. At its core, the artifact advances a specific understanding of what matters in vocal preparation. Concepts of bodily orientation, sensory accessibility, and gradual movement from perception to phonation. This understanding is shaped by the project's use of interoception, proprioception, embodied pedagogy, and neurodivergent studies.

A key conceptual strength is the project's treatment of body awareness as plural rather than singular. The portfolio distinguishes between interoceptive and proprioceptive processes and uses that distinction to explain why grounding, weight, pressure, and spatial orientation may be more available starting points than more abstract internal cues. This conceptual priority is visible in the Weight Shift and Sway exercise, which instructs the singer to *“slowly shift the weight from the left foot to the right and back... allow a slow pendulum sway side to side”* with the explicit rationale that *“slow rhythmic movements activates proprioceptive receptors in muscles and joints directly supporting the sense of body in space that underpins postural stability for singing”* (Appendix A).

The choice to begin with gross motor, externally verifiable movement (rather than internal breath or resonance attention) reflects the artifact's foundational conceptual claim that proprioceptive access may be more reliably available to neurodivergent singers than interoceptive access, and therefore should proceed it. MacRitchie and Zicari (2017) document the relationship between body movement and musical performance establishing that physical organization, prior to phonation, measurably

influences both expressive and technical outcomes. This supports the artifact's decision to open with gross motor grounding rather than immediate vocal engagement. The reflective finding that posture, balance, and bodily orientation improved during the pilot phase gives additional weight to this conceptual framing. It suggests that the artifact was appropriately focused on foundational sensory access rather than prematurely targeting complex vocal outcomes.

The artifact also embeds contextual knowledge about neurodivergent embodiment. It does not frame autism or ADHD as pathologies requiring correction, but as contexts that may change how bodily information is processed and how pedagogy should be structured. This matters because it shifts the educational goal from conformity to accessibility. The project's reflective data support this contextual understanding by showing that usefulness was state-dependent. On some days the sequence improved orientation and readiness. On others, especially under emotional strain, certain tasks increased frustration. This reinforces the idea that pedagogy must respond to the learner's current state rather than impose a single ideal pathway.

Another important factual insight concerns variability in sensation. The resonance exercises were designed to make vocal vibration more concrete through tactile attention. Yet, the pilot reflections revealed that illness and allergies changed where the resonance was perceived, and how it was perceived. This is an important conceptual correction. It indicates that even when tactile resonance work is useful, it should not be framed as producing a single, repeatable map of sensation, but instead, resonance

perception is mediated by bodily condition. This may suggest that the singer's factual knowledge of their instrument should include variability, not just consistency.

The know-what section also clarifies the artifacts scope. The warm up sequence is designed to support body awareness, regulation, and vocal readiness, not to replace a full vocal pedagogy curriculum. It does not directly solve repertoire specific issues such as registration, diction, agility, or performance conditions under pressure. Naming these boundaries is important because it keeps the evaluation proportionate. The artifact appears most effective as a preparatory scaffold and its wider pedagogical value lies in modeling a different way of approaching access to singing rather than in functioning as a complete method. Czerniawska's (2019) review of somatic education methods for musicians similarly concludes that embodied approaches are likely more valuable, not as substitutes for technical training, but as preparatory frameworks that widen access to technical engagement. This framing aligns precisely with the artifacts intended scope and supports its positioning as a scaffold, rather than a complete method.

The project's most credible factual claim then is not that the artifact works uniformly, but that it reveals useful truths about the conditions under which somatic vocal preparation becomes accessible, helpful, or frustrating within the author's own embodied practice. In that sense, the know-what dimension is strong because it converts reflective observation into conceptual knowledge about design, state, and bodily variability, while maintaining clarity about the study's single participant scope.

Conclusion

The project demonstrates a clear and persuasive relationship among theory, artifact design, and reflective evaluation. Its main achievement is the development of a somatic-informed warmup sequence that responds thoughtfully to neurodivergent embodiment, and that is grounded in interoceptive, proprioceptive, and embodied pedagogical theory. The pilot reflections suggest that the sequence did support meaningful improvement in posturing, balance, and sense of body and space, which indicates that the grounding logic of the artifact was practically effective.

At the same time, the evaluation makes clear that the artifacts usefulness is conditional. Emotional overload made some phases (especially the body scan and rescan) more frustrating and less accessible. Illness and allergies altered the sensory feedback on which the resonance mapping depends. These limitations are not peripheral but are central to the project's contribution, because they show that somatic practice must remain adaptable to fluctuating emotional and physical states, especially when the practitioner-researcher is also the person living those shifts in real time.

The project therefore, appears to meet its aims in a nuanced, rather than absolute way. It has generated a theoretically grounded and reflectively tested artifact through a process in which the author served as both practitioner and research subject, deepened understanding of the relationship between neurodivergent embodiment and vocal pedagogy, and identified concrete areas for refinement before wider adaptation. Future work should focus on revising the sequence for high arousal contexts, clarifying the

variability of resonance feedback, and testing the artifact more broadly and ethically with other singers. Overall, the project has enabled the practitioner-researcher (working as both subject and designer) to develop and interrogate a somatic warmup that responds to a specific neurodivergent vocal profile, while generating knowledge that may inform more inclusive vocal pedagogy.

Critical Reflection Using Kolb

This critical reflection uses Kolb's structure to interpret the learning that emerged through planning, doing, analyzing, and preparing for future action. It extends the critical review by focusing more explicitly on the project journey and the transformations in understanding that occurred through practice.

Concrete experience

The concrete experience that initiated this project was the repeated mismatch between what vocal pedagogy appeared to demand and what the author's body could reliably perceive or deliver in practice. Instructions that presumed immediate awareness of tension, support, alignment, or resonance did not consistently correspond with the author's lived bodily access. This experience gained sharper meaning when considered through the lens of the late-in-life AuDHD diagnosis, and through literature on interoception and proprioception. The project began then from the practical recognition that conventional vocal preparation was not always organized around the realities of neurodivergent embodiment, and that the author would function as both the subject experiencing this mismatch, and the developer seeking to respond to it.

The piloting phase added further concrete experience to this problem. The warm up sequence did appear to improve bodily awareness in space, suggesting that the beginning with grounding and weight orientation gave the author's body more accessible entry into the singing work. At the same time, the lived experience of using the sequence showed that it could not be treated as universally supportive in every emotional or mental state. On emotionally heavy days, the body scan and rescan could heighten frustration, and during illness or allergy episodes, resonance was perceived differently. These practical experiences provided the basis for a more grounded and less idealized understanding of the artifact precisely because the same individual was responsible both for undergoing the practice and for evaluating it.

Reflective observation

Reflective observation reveals that the project's central insight is bound up with variability. The same exercise could function as supportive on one day and counterproductive on another. This was particularly evident in the body scan and rescan phases, which were designed to deepen sensory awareness, but sometimes became sources of further frustration, or emotional overwhelm when emotional activation was already high. This inconsistency matters because it exposes a tension between structure and responsiveness at the heart of the methodology.

The project also highlighted a discrepancy between design intention and embodied outcome. The sequence was built to reduce cognitive and sensory overwhelm by scaffolding awareness gradually, and in some respects it succeeded, especially through improved postural and spatial awareness. Yet, the reflective findings show that some

forms of inward attention can become too demanding in dysregulated states. Similarly, resonance mapping was intended to make vocal sensation more concrete, but illness and allergies showed that concrete sensation is still variable and context dependent. Reflection, therefore, shifted the project from asking whether the sequence works to asking when, for whom, and under what conditions it works.

Abstract conceptualization

Through abstract conceptualization, the project can be understood as an inquiry into access rather than a simple technique. One of its most significant theoretical insights is that somatic. Vocal pedagogy may function as access design for singers whose bodily cues are not consistently transparent. This reframing places inclusive pedagogy, and embodied practice in direct relationship. Shanahan and Pennington's (2008) review of executive function in ADHD adds a further dimension to this reframing. Difficulties in planning, initiating, and sustaining attentional tasks mean that the cognitive overhead of conventional vocal warmups may be disproportionately high for ADHD practitioners. A somatic sequence that externalizes and sequences that cognitive load into bodily steps may therefore function as an executive function support as much as a sensory one. It also suggests that for some singers awareness is not a supplement to technique, but a precondition for engaging with technique at all.

A second conceptual insight concerns the instability of sensory knowledge. The project's reflections show that bodily information is mediated by emotional state and physical condition, which means that pedagogical methods based on sensation must account for fluctuation, rather than presuming consistency. This insight strengthens the

methodological case for practice-as-research, since such situated, and changeable knowledge is difficult to capture through detached methods alone. The project therefore contributes not only an artifact, but a conceptual framework for understanding somatic voice work as adaptive, contingent, and neurologically situated.

Active experimentation

The next stage of this project should involve revising the artifact to make its adaptive logic more explicit. One practical change would be to develop alternative pathways for high arousal days, such as shortening the body scan, replacing the rescan with a less internally focused grounding task, or allowing users to stop after the stages that are regulating, rather than completing the whole sequence. Another important revision would be to include teaching notes that explain the expected variability of resonance feedback, especially during periods of illness, allergies, or physical fatigue..

Future research should continue exploring the relationship among interoception, proprioception, emotional regulation, and vocal accessibility. Relevant search terms might include “interoception vocal pedagogy,” “neurodivergent singers somatic practice,” “proprioception voice training,” “embodied attention in performance,” and “inclusive vocal pedagogy autism ADHD.” A future pilot, with consenting participants, could test whether the same adaptive principles hold across different singers or whether the artifact is most valuable as a model for individually tailored design rather than as a transferable sequence in fixed form. Kolb's structure makes clear that the project does not end with evaluating the current artifact. It opens into a more responsive and critically

informed next stage of pedagogical inquiry, in which insights generated by the author as both participant and developer may inform wider testing.

The potential impact of this project extends beyond the individual practitioner into the organizational context of K-12 music education. Schools in the United States are increasingly obligated by IDEA (Individuals with Disabilities Education Act, 2004), and Section 504 of the Rehabilitation Act to provide equitable access to learning environments for students with disabilities, including those with autism and ADHD. A somatic warm up sequence designed around neurodivergent embodiment is therefore not merely a personal pedagogical preference. It is a practical response to institutional equity mandates. As a planned next step, the artifact will be introduced directly into vocal lessons with music teaching colleagues, positioning them as the first intentional users of the sequence before any wider classroom application. The staged approach serves a clear organizational purpose. By working first with fellow educators, many of whom personally experience neurodiversity, teach students with SEND (Special Education Needs and Disabilities), or lead inclusive ensembles settings, the artifact can be evaluated for professional transferability in low risk, ethically appropriate contexts. Should colleagues find the sequence useful in their own practice, the intention is to make the artifact available for adaptation with their own students, functioning as a shared pedagogical resource within the school community. This trajectory from individual practice, to peer application, to wider institutional use positions the project as a contribution to organizational performance and inclusive curriculum development,

aligning with professional learning community frameworks that prioritize collaborative evidence informed practice. (DuFour et al., 2016).

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Appendix A:

Artifact: Somatic Vocal Warm-up Sequence

The following sequence is proposed for daily practice. Designed to take approximately 20 to 25 minutes, it proceeds from the ground up, establishing gravitational and proprioceptive grounding before progressively engaging breath, resonance, and finally pitch, and phonation. The sequence reflects the neurological logic of interoceptive architecture by establishing the body's spatial and gravitational reality first. This should

reduce the cognitive overhead of top-down instruction and allow sensation to guide the process (Craig, 2015; Garfinkle & Critchley, 2016).

Stage 1: Grounding (5 minutes)

Exercise: Gravitational Body Scan (standing or seated)

Begin standing with feet hip-width apart, or seated with both feet flat on the floor. Close the eyes. Beginning at the soles of the feet, attend sequentially to each part of the body. Soles, heels, ankles, calves, knees, thighs, hips, lower back, mid back, shoulders, arms, hands, neck, jaw. At each point, the only task is to notice what is present. Weight or pressure, warmth or tension, or numbness without attempting to change it. This body check practice drawn from Mahler's interoceptive curriculum is specifically designed to cultivate the bottom-up body awareness that proprioceptive differences in neurodivergent individuals may otherwise obscure. After completing the scan, notice the quality of contact the body makes with the floor or chair. Feel the specific textures and pressures. This gravitational grounding activates the proprioceptive system and establishes a felt sense of physical presence before any vocal demand is introduced.

Exercise: Weight Shift and Sway

Slowly shift weight from the left foot to the right, and back. Then forward onto the balls of the feet, and back onto the heels. Allow a slow pendulum sway side to side. Bristol Autism Support (2022) notes that this kind of slow rhythmic movements activates proprioceptive receptors in muscles and joints, directly supporting the sense of body in

space that underpins postural stability for singing. The exercise is completed when there is a clearer felt sense of balanced uprightness. A sense of the body organizing itself around its own center of gravity.

Stage 2: Breath Arrival (5 minutes)

Exercise: Panoramic Breath

Maintaining the upright, grounded standing position. Place the hands-on the lower ribs. Without controlling the breath, simply observe. Feel the rib cage expand laterally on the inhale, and narrow on the exhale. Lazarus and Abramson (2019) argue that this kind of observational, non corrective breath attention is the necessary first movement in a holistic vocal pedagogy. It resists the common pedagogical impulse to immediately correct and instead treats the singer's natural breath pattern as information. After four to six natural breaths, allow the exhale to carry a gentle, unvoiced sigh. Then, let the sigh acquire soft voicing. Not pitched, just a buzzed breath. This marks the threshold between somatic preparation and phonation, and doing it gradually honors the nervous system's need for transition rather than demand.

Exercise: Sighing Siren on Open Vowel

Moving from the sighed breath, allow the voice to slide through a comfortable pitch range on an open vowel, without aiming for any particular pitch. The purpose is not intonation, but sensation. Feel where resonance lives in the body as the pitch changes. Brunkan (2016) identifies body awareness exercises as measurably reducing singer

tension. This gliding exploratory phonation, without a target note, should remove performance pressure, while beginning to engage the resonating system. Notice physical sensation rather than listening critically. Where does the chest buzz? Where does the skull ring?

Stage 3: Resonance Mapping (7 minutes)

Exercise: Lip Trill or Tongue Trill Through Five-note Scale

Using a lip trill or tongue trill, move through a five-note ascending and descending pattern at a comfortable tempo. The semi occluded vocal track position reduces laryngeal effort while maintaining phonation, providing the proprioceptive sensation of vibration along the face, lips, and skull with minimal strain. Lovetri (2019) specifically advocates for this kind of tactile feedback in somatic voice work, as it makes resonance physically palpable, rather than conceptually abstract. This may be a critical advantage for singers whose interoceptive processing is nonstandard.

Exercise: Humming with Hand Resonance Check

Hum on 'M' or 'N' and place one hand on the sternum, and the other on the face. Move slowly up through the mid-range. Notice where vibration is felt on each hand, and at what pitch the quality of sensation shifts. This is an adaptation of Thurman and Welch's (2020) body mapping approach: learning the geography of one's own vocal instrument through direct tactile sensation rather than imagery or analogy. For neurodivergent

singers who find metaphorical instruction difficult to grasp, this more concrete, hands-on resonance mapping may provide an alternative proprioceptive pathway.

Stage 4: Integration (5-8 minutes)

Exercise: Text-free Melodic Phrase

Take a simple melodic phrase of four to eight notes (a phrase from any piece in the current repertoire, or a phrase invented in the moment) sing it on a neutral syllable at a comfortable dynamic level with the sole intention of attending to physical sensation throughout. What does the body feel during phonation? Where is their ease? Where is their effort? This metacognitive attentional practice corresponds to Garfinkel and Critchley's (2016) third dimension of interoception (interoceptive awareness), and its cultivation over time may meaningfully improve the accuracy of the singer's self monitoring. Williamon and Thompson (2006), established that the capacity to attend simultaneously to both internal sensation and external musical production is a hallmark of expert performance. This exercise may begin to build that dual attention.

Exercise: Brief Stillness and Rescan

Return to standing stillness, complete a shortened body scan. Notice what, if anything, has shifted since the opening body check. This closing integration, drawn from mindfulness based intervention frameworks (Weiss et al., 2018), consolidates the proprioceptive and interoceptive learning of the session and creates a paired “before

and after” reference. A practice of noticing change over time may gradually build to somatic self knowledge.

Appendix B:

Daily Tracker

Exercise effectiveness was rated on a scale of 1-5 with 1 being the lowest perceived effectiveness and 5 being the highest. Patterns were then noted at week’s end.

Day	Start arousal (VL / L / M / H / VH)	End arousal (VL / L / M / H / VH)	Overall body awareness (1–5)	Overall vocal readiness (1–5)	Notes (1–2 key words)
Mon					
Tue					
Wed					
Thu					
Fri					
Sat					
Sun					

Key:

- VL: very low
- L: low
- M: medium
- H: high

- VH: very high