Sensing the Research Field: A Somatic Methodology for Awareness-Based Collaborative Inquiry

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Abstract

The complexity of contemporary challenges demands collaborative, interdisciplinary forms of knowledge production capable of integrating multiple ways of knowing. Yet the dominant research model brackets the conditions that make genuine collective inquiry possible — the quality of presence, the relational ground, the somatic attunement that builds trust and collective intelligence. This paper presents a methodological prototype that both implements and measures these conditions, drawing on two Social Presencing Theater practices: the Stuck practice as a daily somatic check-in building inter-researcher attunement, and 3D mapping as a collaborative material practice for project development and field sensing. Two researchers integrated both practices into an ongoing project on aesthetic sustainability and embodied learning in design. Results show statistically traceable change: posture shifts significantly toward openness within each session ($p = 0.012$), entry posture orientation shifts progressively inward across the research arc ($p = 0.02$–0.03), trust-coded language increases significantly after each practice ($p = 0.023$), and the affective valence of entry postures shifts from negative to positive over time. A compensatory within-session dynamic is also identified: the practice orients toward the affective quality latent in the entry posture rather than amplifying what is already present. Situated within the science of the social field and awareness-based design, we propose this prototype as a contribution to a knowledge production that values the quality of the process — the relational ground, the somatic attunement, the container built between researchers — as much as the outcomes it generates.

Keywords

embodied inquiry, Social Presencing Theater, collective intelligence, awareness-based design, methodological prototype, relational attunement, science of the social field

Introduction

Interdisciplinary collaborations are increasingly central to knowledge production across academic research, design practice, and organizational contexts (Fortunato et al. 2018; Wu et al. 2019). Their capacity to generate collective intelligence (Woolley et al. 2010) depends on conditions that standard methods rarely make visible: the quality of presence researchers bring to their work, the relational ground that enables genuine exchange, the body's ongoing registration of the field it inhabits. These conditions are arguably constitutive of inquiry (Scharmer & Pomeroy 2024), yet when the affective and somatic dimensions of a collaboration remain tacit and untracked, something essential about the knowledge being produced goes unexamined. This paper proposes to make that layer visible — through practices that provide a container for the relational and material dimensions of the research process, and through methods that allow their impact to be measured over time.

The relational conditions of collective inquiry

Knowledge production is increasingly collaborative (Wuchty et al. 2007). The recognition that complex problems require diverse epistemic contributions has an epistemological dimension: different researchers bring different paradigms, different worldviews, different ways of seeing, and genuine innovation requires the confrontation of lenses rather than the confirmation of any single one (Jaeger et al. 2023). This perspectival argument has become especially pressing in participatory and citizen science approaches, where people from non-academic backgrounds are brought into knowledge production as co-investigators — raising fundamental questions about how their participation is structured, how their voices are included, and how the facilitation of genuinely diverse inquiry is made possible (Senabre Hidalgo et al. 2021; Masselot et al. 2023; Sauermann et al. 2020).

This process orientation has been formalized in team science and collective intelligence research, which have identified the specific conditions under which groups produce more than the sum of their individual perspectives. These conditions are not primarily cognitive: group-level performance is predicted by social sensitivity — the degree to which members read each other's states — by equality of participation, and by the synchrony that emerges in well-coordinated groups (Woolley et al. 2010; Chikersal et al. 2017; Riedl et al. 2021). Trust and psychological safety – the degree to which team members feel safe to take interpersonal risks, to show uncertainty, to offer what they do not yet know, to be seen in difficulty — are widely recognized as central conditions for collaborative inquiry (Edmondson 1999). Yet trust in this sense is not primarily a cognitive stance but a somatic one. Within enactive and somatic frameworks, trust is understood as emerging through bodily and relational processes that precede explicit verbal articulation (De Jaegher & Di Paolo 2007). Participatory approaches to knowledge production — citizen science, hackathons, collaborative design sprints, co-creation labs — have pushed further in this direction, explicitly bringing diverse bodies into the research process (Senabre Hidalgo et al. 2021; Haklay 2013). Yet even here the body tends to be energized toward outputs: mobilized for its contributions, its

enthusiasm, its labor, rather than attended to as a site of knowing in its own right. Standard facilitation practices remain primarily verbal: check-ins, retrospectives, facilitated dialogue. They operate at the cognitive level where trust is already named, not at the somatic level where it is first registered. The gap is methodological: there are few practices for building and measuring this quality of presence in collaborative research contexts.

The body as a site of knowing

An emerging constellation of epistemologies converges on this gap. Indigenous knowledge systems (Goodchild 2021, 2022; Yunkaporta 2019) have long held that knowing is relational, place-based, and enacted through somatic attunement to the living world. Research in somaesthetics, somadesign, and embodied cognition has increasingly argued that knowledge production is materially and bodily situated rather than exclusively cognitive (Shusterman 1999, 2012; Höök 2020; Groth 2017; Schoeller et al. 2024). Rather than treating the body as a passive support for thought, these approaches position it as an active site of perception, attunement, and meaning-making. Somadesign in particular emphasizes the researcher's and designer's perceptual state, bodily gestures, and sensory engagement with materials as constitutive dimensions of inquiry (Lee, Lim, and Shusterman 2014; Höök et al. 2019). From this perspective, materials are also not neutral substrates but relational participants that shape and are shaped through embodied interaction (Parisi, Rognoli, and Sonneveld 2017; Bennett 2010). These insights extend broader work in science and technology studies showing that research practice is always materially embedded. Latour and Woolgar's Laboratory Life (1986), for example, showed that researchers' bodily routines, spatial arrangements, and engagements with instruments are integral to the production of scientific knowledge rather than external conditions surrounding it. The researcher's body is already an instrument within every research environment; somatic practice makes this instrument consciously perceptible. Materiality in research extends beyond laboratory objects alone: reading and text themselves can also be understood as embodied and aesthetic-material practices shaped by perception and sensory engagement (Toro and Trasmundi 2024).

Awareness-based practices as methodological response

Naming the body as an epistemic instrument does not by itself provide methods for working with it in collaborative inquiry. Doing so requires entering the present moment — the body's current registration of the relational field, the project, the collaboration — before verbal processing has organized it into positions and arguments. This is the contribution of somatic and awareness-based practices. The body stores procedural memories and sensorimotor patterns formed in relational history that shape ongoing collaboration without being accessible to verbal reflection (van der Kolk 2014). Co-regulation is often theorized as involving posture, affective synchrony, and nonverbal responsiveness alongside verbal exchange (Zaki & Williams 2013). These traditions also suggest that embodied and relational dimensions of inquiry cannot be accessed through reflection alone. Somaesthetic and awareness-based practices introduce

methods of slowing down, sensory attunement, and defamiliarization that make tacit perceptual and relational processes available to inquiry (Shusterman 2012; Tsaknaki et al. 2019; Gonçalves & Grocott 2024). As Tsaknaki argues, such practices “make the familiar strange” in order to open new perceptual and relational possibilities (Wehmeyer & Massacrier 2025).

Within the science of the social field, Scharmer and Pomeroy (2024, 2026) have proposed that genuine collective inquiry requires a fourth-person epistemic register — an awareness of the field that researcher and researched co-inhabit — and have called for methodologies adequate to this register. Social Presencing Theater practices are intended to operationalize this register: they channel the researcher's relationship to the project, the collaboration, and the present moment through posture and the arrangement of materials rather than through verbal articulation, making somatic and relational data available that conversation alone cannot surface (Hayashi 2021; Gonçalves & Hayashi 2021). Awareness-based design has extended this principle into design research, proposing that the practitioner's bodily and perceptual state is constitutive of the work itself — presencing the body is a precondition of rigorous inquiry rather than a supplement to it (Höök 2020; Gonçalves & Grocott 2024). Recent work has shown that immersive relational containers structured around awareness-based and embodied practices can support the development of co-regulatory capacity over time, with program design shaping the trajectory of integration (Feldman & Santolini 2026). What these approaches share is a recognition that process quality — the relational ground, the somatic attunement, the container built between researchers before the cognitive work begins — constitutes an epistemic condition of collective knowledge production, and one that can be practiced, cultivated, and traced.

The prototype and its contribution

We present a methodological prototype integrating two Social Presencing Theater (SPT) practices (Hayashi 2021) into an ongoing research project on aesthetic sustainability and embodied learning in design. Two of the authors — LM and ZLW — used 3D mapping at three points across the project arc as a collaborative, material practice for project development and field sensing. Alongside this, they implemented the Stuck practice as an individual somatic check-in at the start of each shared working day, recording their postures on video and exchanging a single resonance word with each other after each session The protocol introduced a deliberate variation: rather than the practitioner naming their own word, the co-researcher offered the first word arising in response to the other's pose — shifting the practice from individual somatic inquiry to inter-somatic dialogue, and making the resonance word a second-person datum. Together the two practices constituted a somatic scaffold for the collaboration: the 3D mapping working at the level of shared material field-sensing and project ideation; the Stuck working at the level of daily affective attunement between researchers. The researchers are simultaneously practitioners, protocol designers, and subjects — a triple role that enacts the perspectival, participatory epistemology (Haraway 1988; Marshall 2004) the paper advocates.

This paper reports quantitative results for the Stuck practice, given its longitudinal density and tractability as data; the 3D mapping is described as methodological context and discussed as a complementary layer of the somatic research ecology. The results show coherent, statistically traceable somatic evolution across the research arc: posture shifts significantly toward openness within each session (Bowker $p=0.012$), the orientation of entry postures shifts progressively inward across the research arc (Cochran-Armitage $p=0.02$ and $p=0.03$ for body and face orientation respectively), trust-coded language increases significantly after each practice ($p=0.023$), and the affective valence of entry postures shifts from negative to positive across the research arc. These findings suggest that the relational and affective dimensions of a research collaboration — typically invisible to its methods — can be both cultivated through pre-verbal somatic practice and made traceable through systematic analysis. We interpret these results within the framework of awareness-based systems change and the science of the social field, and propose this prototype as a contribution to a broader shift in knowledge production: one that values the quality of the process — the relational ground, the somatic attunement, the container built between researchers — as much as the outcomes it generates.

Methods

Research context

This study emerges from a master's research project on aesthetic sustainability and embodied learning in design practice, conducted by LM and ZLW. The project investigated how practitioners develop aesthetic sensibilities through sustained material engagement — specifically how embodied, sensory, and relational dimensions of design practice contribute to more sustainable forms of making and learning. The fieldwork consisted of semi-structured interviews with designers and educators, combined with material explorations in which participants engaged directly with objects, textures, and processes as part of the research encounter itself. The project sat at the intersection of somaesthetics, material culture, and design pedagogy — a domain in which the body and its engagement with materials are central to the research object rather than incidental to it. Integrating somatic practices into the research process was therefore a methodological coherence: researchers studying how bodies know through materials chose to practice that knowing themselves.

The protocol was designed to generate data across four epistemic registers, following the framework proposed by Scharmer and Pomeroy (2024). First-person data — the somatic self-reports and journaling accounts of LM and ZLW — captures the inner dimension of practice: what the body registered from the inside, session by session. Second-person data — the resonance word offered by the co-researcher in response to the other's pose — captures the inter-somatic dimension: one body reading another body's registration of the shared field, before verbal exchange has organized the encounter. Third-person data — the postural coding and NRC sentiment analysis — captures the observable, analyzable dimension: patterns that can be reported, tested, and shared across the boundary of the research dyad. Fourth-person data — the Stuck practice and 3D mapping sessions — operates at the level of collective field sensing:

the shared material inquiry into the living state of the project and the relational ecology surrounding it. Together the four registers constitute a methodological triangulation across the full range of what can be known about a collaborative research process — from the interior of individual somatic experience to the collective sensing of the field the collaboration inhabits.

The 3D mapping practice

The 3D mapping was practiced in person, collaboratively, at three points — beginning, midpoint, and close of the project — timed to bracket the research arc at each major transition. Each session began with meditation and journaling, using a structured set of questions that moved between inner state, current project situation, relational field, and collective support network. The journaling was followed by a material mapping: using physical objects, the researchers gave spatial form to the current state of the project, sensed into its tensions and possibilities, and identified next steps. The practice was explicitly process-oriented — as the first session's notes record, an orientation toward "life in the here and now, put on the lens of your choice (which could change)" — treating the project as a living, evolving field.

The SPT Stuck practice

The Stuck practice is part of Social Presencing Theater (SPT), developed by Arawana Hayashi within the framework of Theory U (Hayashi 2021; Scharmer 2018). It invites the practitioner to let their body incarnate a defined struggle and then sense into a potential future — producing a from/to somatic arc that holds the current constraint and an emergent direction without resolving the tension between them. The practice accesses a pre-conceptual layer of the researcher's relationship to their work: what the body registers before language arrives.

LM and ZLW integrated the Stuck as a way to begin each research day with a somatic sense of their own state and of what the other person was carrying at a body level. They practiced at home, individually, in a space that felt intimate and separate from the shared workspace of the project — both a deliberate choice and a practical one, enabling a routine that could be maintained regardless of location and the rhythms of daily life. Practicing at home, before the cognitive framing of the day had organized the researcher's relationship to their work, was itself a methodological choice: it positioned the body's registration of the research field as a pre-conceptual datum, prior to any verbal or analytical processing of the day ahead. Each researcher completed their own practice before viewing the other's recording, staying neutral and responding to the pose itself without a shared somatic context already in place. The resonance word came from the co-researcher because what interested them was the perceptual quality of a first impression — meeting someone for the first time that day, before any verbal exchange had organized the encounter.

Data collection, coding, and analysis

LM and ZLW practiced one Stuck at the start of each shared working day across two months (April 30 – June 11, 2025), generating 52 poses (Figure 1). Each session followed the same structure: practice alone at home, self-record on video, share with co-researcher by 8pm. The co-researcher responded with a single resonance word for each pose — the first word arising, without deliberation — before viewing the other's recording, ensuring independence of response.

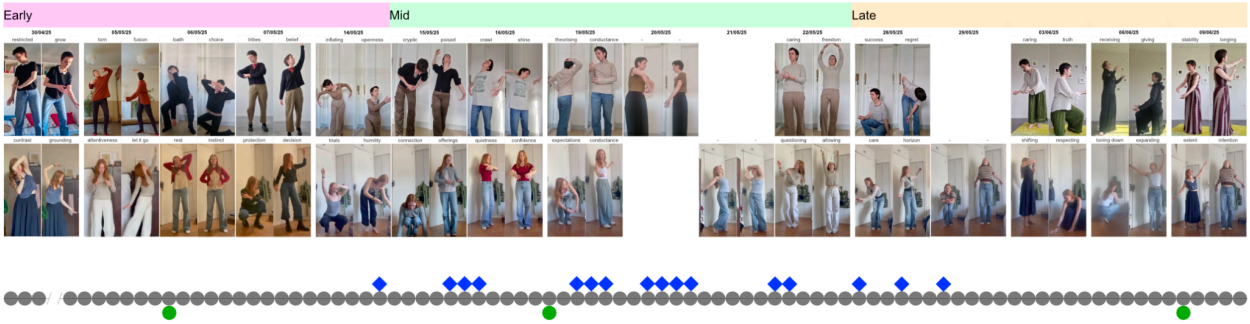
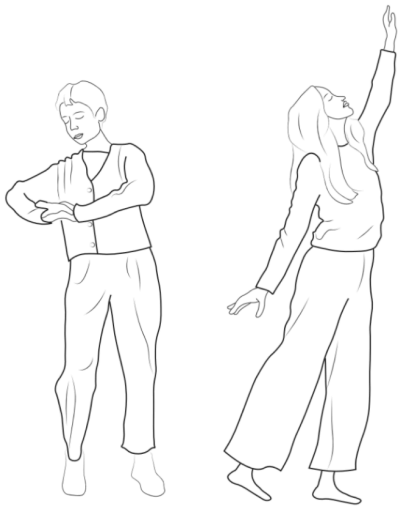


Figure 1. Research timeline and practice ecology. The full arc of the research project (April–June 2025), showing all 52 poses across 16 practice days organized by researcher and phase (Early/pink, Mid/green, Late/yellow), and the project timeline with key events showing practice days (blue), and the 3D mapping sessions (green).

Each pose was coded along four dimensions (Figure 2): openness (open/closed), height (up/down), body direction toward camera (facing/right/left), face direction toward camera (facing/right/left). Within-session postural change was assessed using Bowker's test of symmetry applied to the from/to transition matrix for each postural dimension — a non-parametric test for asymmetry in matched-pairs categorical data that detects directional shifts without assuming independence. Longitudinal change in postural distributions across three temporal phases was assessed using Cochran-Armitage trend tests for monotonic change within individual postural categories.

a



Archetype 1: *-from*
Closed up
(body)facing
(face)right

Archetype 2: -to
Open up
(body)facing
(face)left

b

	Openness		Height of the pose		Body direction towards the camera			Face direction towards the camera		
	closed	open	up	down	facing	right	left	facing	right	left
Zoe -from	10	3	7	6	8	1	4	4	2	7
Zoe -to	4	9	11	2	10	0	3	4	2	7
Louise -from	7	6	1	3	7	4	2	1	9	3
Louise -to	3	10	8	5	7	2	4	3	3	7

Figure 2. Posture documentation and coding. (a) Archetypal illustrations of the Stuck practice. (b) Coding table showing distributions of four postural dimensions for each researcher across all practice days.

Resonance words were analyzed using NRC sentiment analysis (Mohammad & Turney 2013) via the *Syuzhet* package in R. The NRC Word-Emotion Association Lexicon was constructed through crowdsourced annotation, in which human raters associated words with eight basic emotions (anger, disgust, fear, sadness, anticipation, joy, surprise, trust) and two valence dimensions (positive, negative) drawn from Plutchik's (1980) model of affect. Each word receives a binary score per emotion category based on majority annotation across approximately 14,000 English words. Each resonance word was scored across all ten dimensions. Sessions were binned into three temporal phases (Early/Mid/Late) for longitudinal analysis, defined by equal-width tercile splits of the session date distribution. Within-session compensatory dynamics between *from*- and *to*-word sentiment were assessed using pairwise Spearman correlations between *from*-word and *to*-word scores across all sessions.

Results

The protocol generated data across four complementary registers, each capturing a different layer of the collaboration's evolution. The following sections report quantitative results for the Stuck practice across three dimensions: the within-session postural shift, the within-session affective shift registered through resonance words, and the longitudinal affective evolution across the research arc. The 3D mapping sessions, which operated as qualitative field observations at three structural transitions, are discussed as a complementary layer in the Discussion.

Within-session and longitudinal postural change

Across practice sessions, posture shifted significantly from closed to open between the *from* and *to* poses (Bowker's test of symmetry $p = 0.012$, Figure 3a). The *from* poses were predominantly closed — ZLW's in 10 of 13 sessions, LM's in 7 of 13 — while the *to* poses shifted markedly toward openness: 9 of 13 and 10 of 13 respectively. The reverse transition — open *from* to closed *to* — was rare across both researchers. Of the four coded postural dimensions, openness was the only one to show a significant within-session shift; height, body direction, and face direction showed no significant asymmetric transitions (Bowker $p = 0.53$, $p = 0.72$, and $p = 0.51$ respectively). This finding suggests that the practice produces a reliable somatic movement toward openness within each session, independent of the content of the struggle being embodied.

Longitudinal analysis across the three project phases revealed no significant change in openness or height distributions over time. However, two significant monotonic trends emerged in the *from* pose: the proportion of body positions directly facing the camera decreased from 0.80 in the Early phase to 0.25 in the Late phase (Cochran-Armitage $p = 0.02$, Figure 3b), mirrored by a parallel trend in face orientation, which dropped from 0.40 facing Early to 0.00 facing Late ($p = 0.03$, Figure 3c).

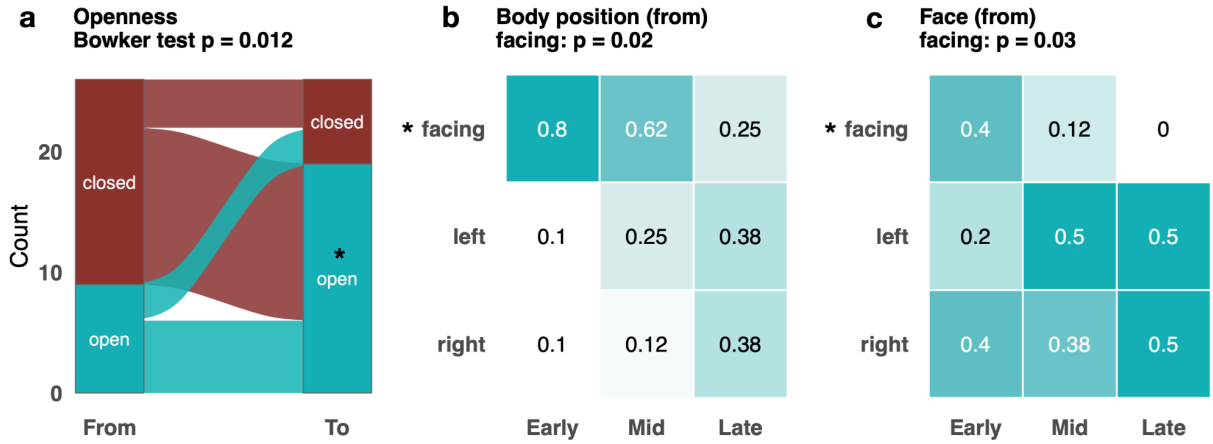


Figure 3. Within-session and longitudinal postural shifts. (a) Alluvial diagram of openness transitions across sessions: closed from poses predominantly shift to open to poses (Bowker p = 0.012). (b–c) Temporal heatmaps showing monotonic decrease in camera-facing body (p = 0.02) and face (p = 0.03) orientation across Early/Mid/Late phases. *p < 0.05.

The quantitative pattern — body and face progressively turning away from the camera across Early, Mid, and Late phases — had a specific felt quality that both researchers described independently. For LM, the turning-away corresponded to a growing trust in the co-researcher's eye: in the intimate space of the practice, the camera was initially the only reminder of the other's gaze, a central element in the tension between wanting to sense one's own body and wanting that sensing to be perceived. With time, the question of how one would be perceived became less pressing as trust in both the practice and the co-researcher grew. For ZLW, the shift was connected to a growing sense of privacy and safety within the practice itself: conducting the Stuck alone, in an intimate domestic space, became a protected environment for somatic inquiry, increasingly separated from the performative demands of the research process. As the routine stabilized, awareness of being recorded receded into the background, allowing greater immersion in the felt experience rather than its appearance.

At the same time, sustaining full presence in each session became more demanding across the two months, not less. The body carried memories of previous poses, interpretations, and resonance words, creating an ongoing temptation to reproduce familiar gestures or to anticipate meaning before entering the practice. A central challenge became approaching each session as an unmarked beginning — resisting both the repetition of prior embodied patterns and the intentional production of novelty. This tension between accumulated somatic memory and the demand for fresh presence suggests that longitudinal somatic practice introduces a form of practice-specific challenge that single-session or workshop-based protocols do not encounter.

Affective register of the resonance words: within-session patterns

The postural opening documented above is mirrored in the affective register of the resonance words. The *from* lexicon (Figure 4a) — dominated by words such as

questioning, *cryptic, theorising*, *restricted*, *expectations* — reflects a body engaged with the tensions and constraints of the research situation. The *to* lexicon (Figure 4b) shifts toward agency and relational expansion: *conductance*, *openness*, *confidence*, *freedom*, *grounding*, *intention*. The most frequent *to* word, *conductance*, is worth noting: it names active channeling rather than arrival — a body oriented toward transmission rather than resolution.

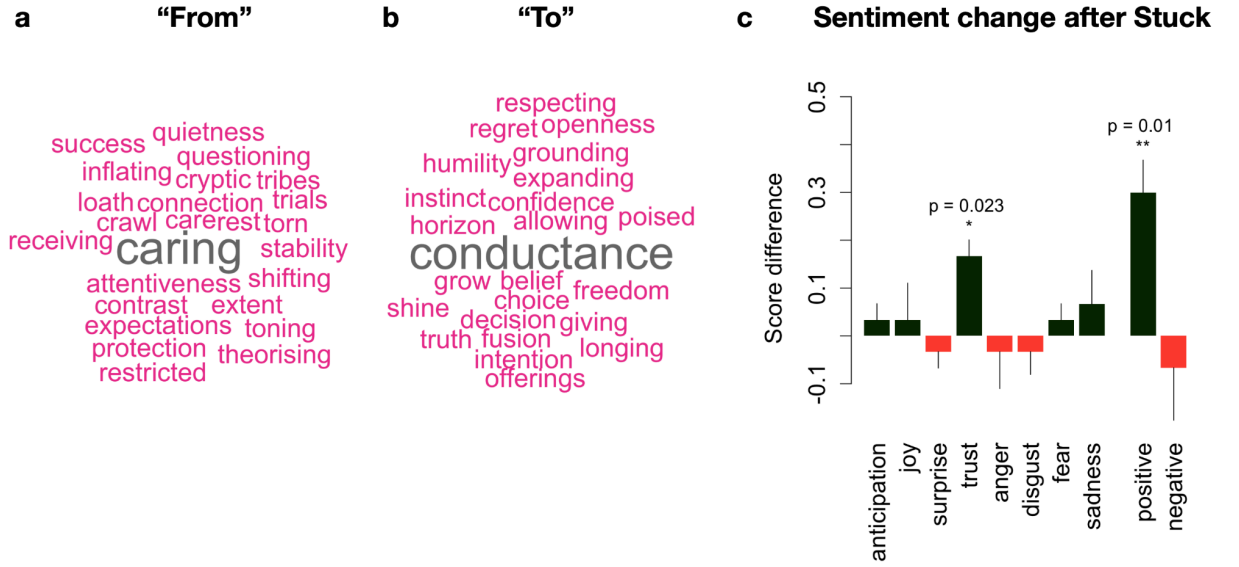


Figure 4. Resonance word lexicons and within-session affective shift. (a,b) Word clouds for *from* and *to* poses: *from* words reflect constraint and relational complexity; *to* words shift toward agency and expansion. (c) Mean difference in NRC sentiment scores between *to* and *from* words across 26 sessions: trust (p = 0.023) and positive valence (p = 0.01) increase significantly.

This directional quality is confirmed in the quantitative structure of the within-session word pairs (Figure 4c). The resonance words associated with the *to* poses carried significantly higher trust scores than those associated with the *from* poses (p = 0.023), alongside a significant increase in overall positive valence (p = 0.01). Of the eight basic NRC emotions, trust was the only one to show a statistically significant within-session increase. Negative valence decreased, though not significantly. The compensatory structure extends further: higher negative valence in the entry word predicted higher positive valence in the landing word (Spearman rho = 0.41, p = 0.025), and symmetrically, higher positive valence in the entry word predicted higher negative valence in the landing word (rho = 0.56, p = 0.001). The practice orients toward whatever affective quality is latent rather than present — a compensatory-like dynamic consistent with the Stuck's design of holding constraint and emergent direction simultaneously.

The specificity of the trust signal deserves interpretation. The resonance word is produced by the co-researcher, not the practitioner — it is a second-person datum, one body reading another body's registration of the shared field. The co-researcher does not name trust explicitly, but the words they choose to describe the other's *to* pose

consistently carry higher trust loading in the NRC lexicon. Receiving that word carried a specific quality: being seen as the body one had that day — seen not only as a researcher but as the body doing the research. This form of recognition — mutual, pre-verbal, renewed each morning — was experienced as a shared vulnerability, its safety grounded in the symmetry of the exchange: each researcher both offered their pose and received a word in return. What participants experienced as developing over time was a sense of attunement — getting to the same frequency before the day's work began. For ZLW, this attunement extended to the interpretation process itself: the resonance word, initially a source of tension between spontaneous perception and reflective search for accuracy, became across the two months more direct — less a cognitive decision than a registration of the other's embodied state, the first word arriving before deliberation could frame it.

Valence trajectories and emotional development across project phases

Across the three project phases, the affective valence of the *from* resonance words shifted from negative to positive (Figure 5). In the Early phase, the *from* words carried higher negative loading — anger and disgust were present and subsequently decreased toward zero (Figure 6). From the Mid phase onward, positive emotions emerged progressively: anticipation, joy, and surprise increased through the Late phase. Trust remained absent from the *from* words throughout all phases.

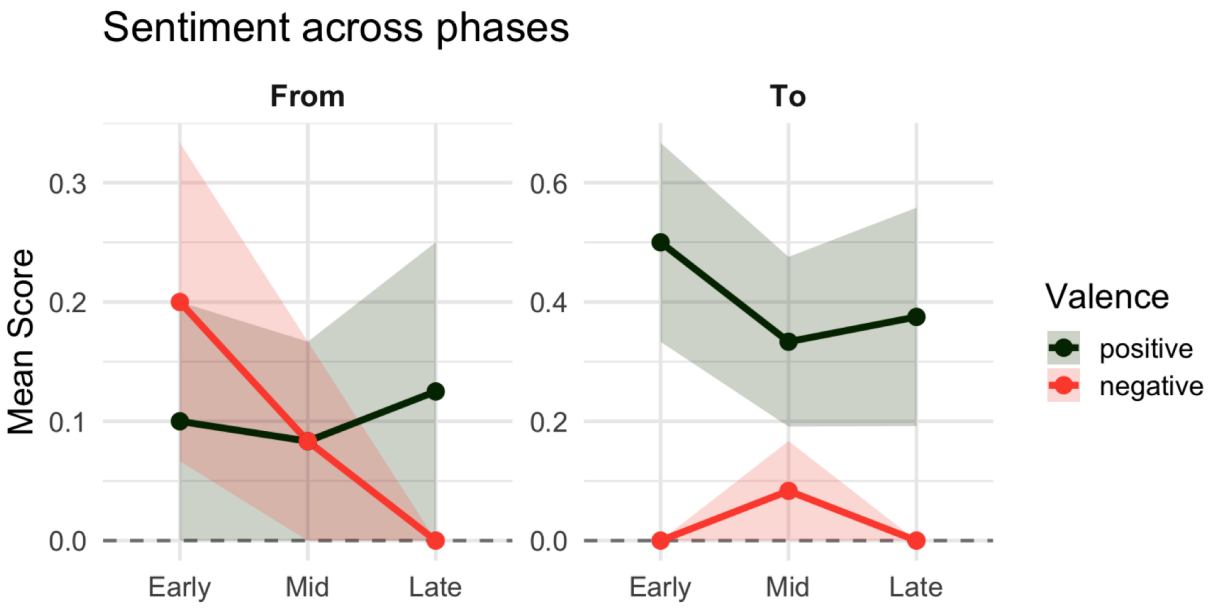


Figure 5. Longitudinal evolution of sentiment valence across project phases. Mean positive and negative NRC scores (±SE) for *from* (left) and *to* (right) resonance words across Early/Mid/Late phases. *From*-word negative valence decreases to zero in Late; *to*-word positive valence remains consistently high (~0.38–0.48) throughout. Phase boundaries are defined by equal-width tercile splits.

In the context of *to* words, trust and joy were present from the Early phase and remained relatively stable across all three phases — a consistent affective ground

maintained throughout the research arc. In the Late phase, as the project moved toward closure, sadness and fear emerged alongside the stable trust and joy signal. The co-occurrence of difficult emotions with a maintained ground of trust and joy is consistent with a growing capacity to hold complexity. Though causal attribution is not possible, the pattern is consistent with the hypothesis that the practice builds affective tolerance across the research arc.

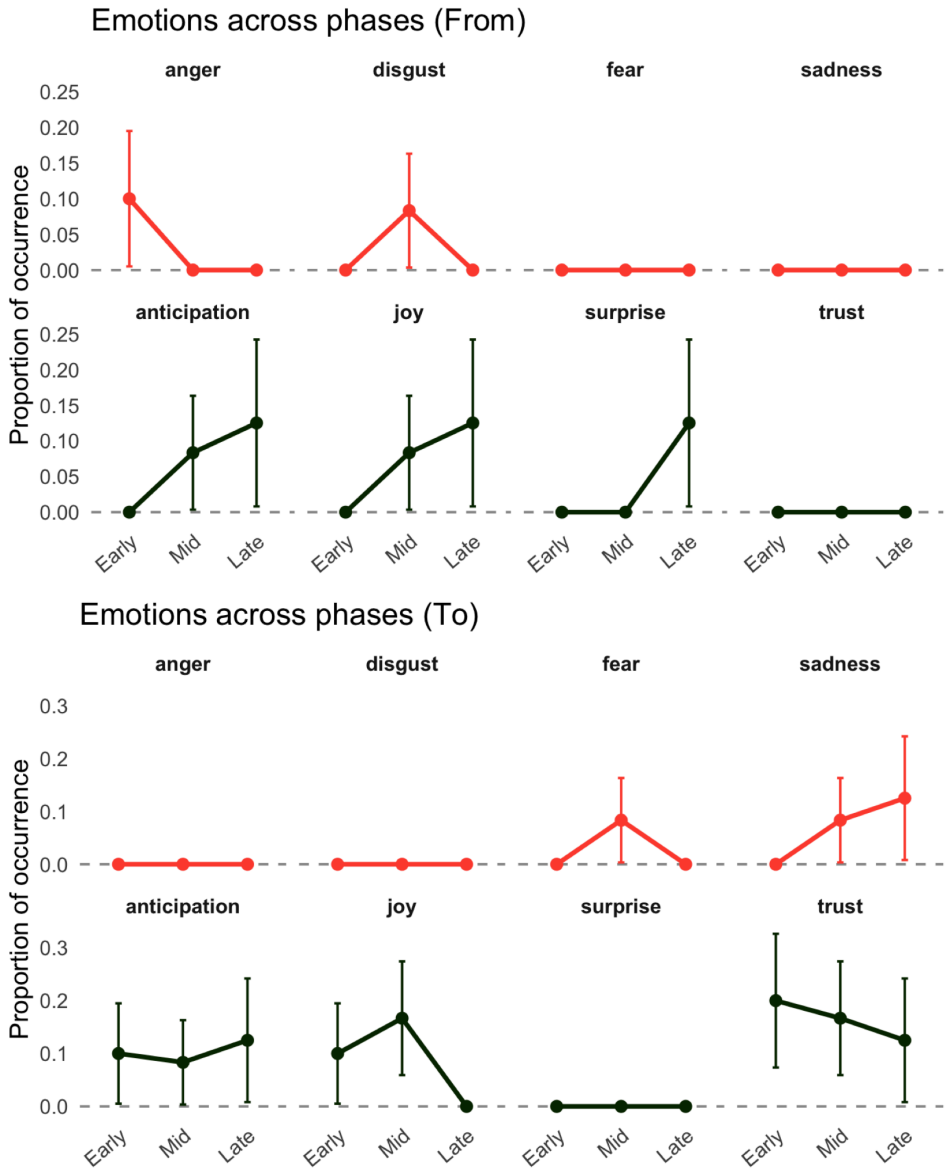


Figure 6. Longitudinal evolution of NRC emotions across project phases. Proportion of each emotion in *from* (top) and *to* (bottom) resonance words across Early/Mid/Late phases (±SE); patterns presented descriptively. *From* words: anger and disgust decrease; anticipation, joy, and surprise emerge from Mid. *To* words: trust and anticipation stable; joy recedes in Late; sadness rises at closure.

The longitudinal arc corresponded closely to how the research felt from the inside. For LM, the Early phase carried the weight of beginning: uncertainty about the project's direction, but also a more specific uncertainty about how to ground the integration of embodied practices into research without yet having a concrete sense of their relevance. What had to be established was not only the work relationship but trust as colleagues — distinct from the pre-existing friendship — and the relational field within which the practice could become meaningful. As the interview phase intensified in the Mid phase, certain sessions felt more loaded: on high-stakes interview days, the *from* pose carried heightened anticipation, the boundary between the day's demands and the somatic practice more permeable. In the Late phase, as the ending of the project approached, words such as *longing* and *intention* appeared in the *to* position — the body sensing an ending and an imminent threshold.

Holding sadness and trust simultaneously in the later sessions did not feel contradictory. For LM, the co-presence of these states made relational sense: the trust that had been built across the two months was experienced as durable, as something long-lasting, while the sadness arose precisely from the awareness that the framework enabling its construction was coming to an end — and with it the particular rhythm of remote and in-person exchange the practice had made possible. For ZLW, the sadness emerged from sensing that the project was approaching its end while the collaboration still held far more potential than the available timeframe could contain: many additional questions, directions, and possibilities had surfaced across the research arc, exceeding the temporal boundaries of the master's project itself. What the practice had built was not only interpersonal trust but a sense of having found each other as research collaborators — a collaborative trust, in ZLW's terms, extending beyond the institutional framework that had initiated it. The sadness therefore did not signal rupture but the recognition that something meaningful had been built whose continuation could no longer be held by the original project structure alone. The trust provided a ground within which this recognition could be present without foreclosing the body's forward orientation.

Discussion

Tracing the body across a research arc

This study shows that the relational and affective dimensions of an ongoing research collaboration — typically invisible to its methods — can be made visible, traced, and analyzed. The body's way of entering the research field changes systematically across the arc of inquiry: posture opens within each session, reorients longitudinally, and the affective valence of entry postures shifts from negative to positive across the research arc. Process-oriented approaches to research assessment (Jaeger et al. 2023) have argued that the quality of inquiry cannot be reduced to its outputs — that the cognitive and relational conditions under which knowledge is produced matter epistemically. The data presented here provides a concrete illustration of what tracing those conditions looks like in practice.

The longitudinal postural data adds a dimension to this visibility that was not anticipated in the protocol design. The progressive turning-away of the *from* pose — body and face moving from direct frontal orientation toward more oblique, interior orientations across the research arc — suggests that the practice itself changes the researcher's relationship to the witnessing other over time. This is a form of somatic development that discursive reflexivity methods are not designed to capture: a change in how the body enters the research field, prior to any cognitive framing of the day's work, and one that unfolds only at the temporal scale of a sustained longitudinal protocol rather than within individual sessions.

A second unanticipated dimension emerged in the practice itself. Across the two months, sustaining full presence in each session became more demanding: the body's memory of previous poses made fresh arrival increasingly difficult, each time requiring a deliberate return to what was present now. One researcher also observed that awareness of the future analysis introduced a reflective distance — a tension between doing the practice and watching oneself do it — that the protocol had not foreseen. Both observations point to a form of practice-specific challenge that single-session or workshop-based protocols do not encounter: longitudinal somatic practice generates its own accumulated history, and working with rather than against that accumulation becomes itself a methodological task.

Four dimensions of collaborative inquiry

The protocol's design across four epistemic registers — first-person somatic self-report, second-person resonance word, third-person postural and sentiment analysis, fourth-person material field sensing — means that the visibility traced here is not one-dimensional. Each register captures a different layer of the collaboration: the interior of individual somatic experience, the inter-somatic reading between bodies, the observable pattern across sessions, and the collective sensing of the project field as a living whole. Three of these four registers share a common requirement: they demand presence in the current moment — the body as it actually is that day, the word that arrives before deliberation, the materials arranged in response to what is felt right now. Only the third-person coding operates retrospectively, on recorded data.

The 3D mapping occupies a distinct position within this ecology. Practiced in person at three structural transitions — beginning, midpoint, and close of the project — it bracketed the research arc at moments of threshold rather than tracking it daily, giving material form to the living state of the collaboration at each major shift. Where the Stuck practice requires the researcher to show up as the body they currently are — making somatic vulnerability a condition of the data — the 3D mapping works through the arrangement of physical objects rather than through the body directly. This distinction matters for future applications: the 3D mapping may offer a lower-threshold entry point into somatic and relational inquiry for research contexts where bodily vulnerability is difficult to establish, while remaining directly oriented toward the project's living field. Exploring it as a standalone protocol remains an open direction.

Trust, attunement, and the cultivation of relational ground

The specificity of the trust finding connects directly to the psychological safety literature. Edmondson (1999) has established that trust — operationalized as the degree to which team members feel safe to be vulnerable and express uncertainty — is among the strongest predictors of team learning and performance. This finding is corroborated at the micro-level: in workshop-based research on collaborative blockages, trust emerged as the dominant affective need named by participants with fear as its consistent counterpart (Feldman & Santolini 2025). The present data extends this finding: trust is not only what collaborators report needing — it is what the body of the co-researcher registers when the Stuck practice is done. The finding that trust is the NRC emotion most reliably increased within each practice session, registered through the co-researcher's resonance word rather than the practitioner's self-report, suggests the practice is actively cultivating the relational ground of the collaboration. This is consistent with De Jaegher and Di Paolo's (2007) account of participatory sense-making: meaning and relational quality arise in the interaction between bodies, not inside either one alone.

Presencing the body

Participatory approaches to knowledge production — citizen science, hackathons, collaborative design sprints — have brought diverse bodies into the research process (Senabre Hidalgo et al., 2021), yet tend to mobilize those bodies toward outputs rather than attend to them as sites of knowing. The significant within-session shift from closed to open posture (Bowker $p = 0.012$) suggests the Stuck practice operates differently: it creates a daily space in which the body is received as it currently is, before it is asked to contribute. This is consistent with Hayashi's (2021) framing of SPT as a practice of presencing — attending to the body's current state as a form of field sensing — and with Höök's (2020) somadesign principle that the practitioner's perceptual and bodily state is constitutive of the work. The practice does not energize the body toward a predetermined outcome; it attunes it to the present moment of the collaboration.

The longitudinal turning-away finding extends this interpretation across a longer temporal scale. The body does not only open within each session — it progressively withdraws from frontal self-presentation across the arc of the project as a whole. The researchers' own accounts clarify the mechanism: the camera, initially a central element in the tension between wanting to sense one's own body and wanting that sensing to be perceived, becomes progressively less salient as trust in the practice and in the co-researcher deepens. The question of how one would be perceived gives way to the question of what is actually present — a shift from performing the stuck toward inhabiting it, that the domestic, unsupervised setting of the practice actively enabled. This domestic, interior quality of the Stuck stands in deliberate contrast to the 3D mapping, practiced together in shared space — together constituting a scaffold across both the individual interior and the collective material field.

Affective tolerance and the capacity to hold complexity

The emergence of sadness and anticipation in the *to* position in the Late phase, co-occurring with stable trust and joy, points toward a dimension of research capacity that standard methodological training does not address: the ability to remain present with difficulty, uncertainty, and the discomfort of project closure without defensive foreclosure. In awareness-based practice, this capacity — sensing into an emerging future without collapsing it into the categories of the past — is precisely what the Stuck practice is designed to cultivate (Scharmer 2018; Hayashi 2021). The longitudinal data is consistent with this: across the research arc, trust and joy provided a stable affective ground within which difficult emotions — sadness, fear — could appear in the Late phase without displacing the positive signal, a pattern suggestive of growing affective tolerance. This has direct implications for research on complex and ambiguous systems, where the capacity to remain present with not-knowing is a methodological requirement.

A related finding concerns somatic memory. Across the two months, arriving freshly in each session became increasingly difficult — the body's accumulation of previous poses created a pull toward repetition that had to be actively resisted. This is consistent with Scharmer's (2018) account of the challenge of presencing: the tendency to collapse the emerging future into the categories of the past, now operating not at the level of thought but of habitual bodily pattern. That the practice itself provided a mechanism for return — attention to the current body dissolving anticipatory thought — suggests the Stuck cultivates not only relational ground but somatic discernment: the capacity to distinguish what is present now from what has been present before.

Toward a process-oriented knowledge production

The broader implication of this prototype is epistemological. The dominant model of knowledge production assesses value through outputs: publications, deliverables, demonstrable findings (Schaefer et al. 2021). What this paper proposes is that the quality of the process — the relational ground built between researchers, the somatic attunement cultivated across the arc of inquiry, the container within which genuine collective knowing becomes possible — constitutes a form of epistemic value in its own right, and one that can be measured. This is consistent with the shift toward process-oriented, participatory assessment argued for by Jaeger et al. (2023), and with the call for methodologies adequate to the science of the social field (Pomeroy et al. 2021; Scharmer & Pomeroy 2026). The body's longitudinal evolution across a research arc is one such process measure — traceable, shareable, and sensitive to the conditions that make genuine collective inquiry possible.

The practices described here are transferable across collaborative knowledge production contexts. Any setting in which people produce knowledge together — design studios, interdisciplinary research teams, community organizations, project-based learning environments — faces the challenge of building relational ground across different backgrounds and domain expertise. Standard practices for doing so are

primarily verbal: check-ins, retrospectives, facilitated dialogue. The Stuck, implemented as a daily dyadic routine, offers a pre-verbal complement: a somatic practice for building inter-researcher attunement before the day's cognitive work begins, requiring no specialized infrastructure beyond a camera and a willing co-researcher. The 3D mapping offers a material complement: a shared practice for giving form to the project's current state and sensing into its next steps. Together they constitute a low-cost, low-infrastructure somatic scaffold adaptable to diverse collaborative contexts, operating at the pre-conceptual level.

Limitations and future directions

It is important to note the various limitations of this study. First, this prototype is explicitly small in scale: two researchers over two months, yielding a corpus of 52 poses. The three-phase longitudinal binning is a pragmatic choice given the available data points, and the findings cannot be generalized beyond this specific collaborative context. This situatedness is, however, a constitutive feature of first-person action inquiry: the epistemic value of self-research lies in its depth and longitudinal resolution within a specific context, rather than in its representativeness across contexts.

LM and ZLW coded their own postures, which introduces the possibility of motivated perception. At the same time, embodied knowledge of one's own practice is an asset in self-research coding: context that an independent coder could not access. Future work should include independent coding to examine what is gained and lost in each approach.

The observed trajectories are consistent with the hypothesis that the practice produced the somatic evolution documented, but the research period involved many concurrent factors — the project itself, the collaborative relationship, the approach of deadlines and the jury. As such, no causal claims can be made from this data. This entanglement is, however, a feature of the design: the Stuck practice was embedded in a living research ecology, and the data reflects that embedding rather than abstracting from it.

The reliance on NRC lexicon scoring for resonance words is a constraint: mapping single words onto emotion categories is a coarse instrument for a subtle somatic signal, and the trust finding in particular should be interpreted with this in mind. Richer linguistic analysis, combined with journaling alongside the practice, would add depth to the affective data in future iterations. The small number of sessions per phase limits the power of longitudinal statistical tests; the sentiment and emotion trends reported here should be interpreted as directionally consistent with the hypotheses rather than as confirmed effects.

Future directions include longer practice periods, larger and more diverse research teams, in particular including researchers from different cultural and somatic traditions, integration of journaling for inner-state tracking (see e.g. Feldman and Santolini 2026), and more systematic analysis of the 3D mapping sessions alongside the Stuck data.

Conclusion

This paper has presented a methodological prototype integrating SPT somatic practices into a collaborative research protocol as a form of daily inter-somatic inquiry. Across two months of practice, the protocol generated exploratory but statistically detectable patterns of somatic evolution — in posture, in affective valence, in trust, and in the compensatory dynamic through which the practice orients toward what is latent rather than amplifying what is already present. Taken together, the findings suggest that the relational and somatic dimensions of a research collaboration are not only cultivable but traceable — that the container built between researchers is itself a form of epistemic data.

The body of the researcher, in this framework, is a “relational antenna”, co-shaped by the field it inhabits, by the materials it engages, and by the collaborative ecology it is embedded in. The Stuck practice and the 3D mapping together constituted a somatic scaffold operating at two complementary scales: daily inter-somatic attunement between researchers, and collective material sensing of the project field as a living whole. Tracking the body's evolution across a research arc is a form of epistemic accountability that process-oriented approaches to knowledge production call for and that current research practice rarely provides.

The system change this paper proposes is modest in its material requirements — it asks for no new technologies, no specialized infrastructure, no institutional overhaul. But it is not modest in its cultural ones. It asks for institutions willing to recognize somatic practice as a legitimate dimension of research work; for researchers willing to develop the bodily literacy that the practice requires; for the permission — relational, institutional, epistemic — to take the step of showing up as the body one is, not only as the mind one brings; and for the conditions to work safely with what that showing up surfaces. Above all, it asks for a shift in what counts as data in collaborative inquiry — a willingness to treat the quality of the process, the relational ground, the somatic attunement, and the container built between researchers as forms of epistemic value alongside the outputs they generate. In an era of increasingly complex, interdisciplinary, and urgently consequential knowledge production, the capacity to build and sustain the human conditions of collective intelligence may matter as much as the methods used to analyze its results.

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Conflict of Interest Statement

The authors declare no conflicts of interest regarding this manuscript

Ethics Statement

This study involved self-research conducted by two of the authors (LM and ZLW), who participated as practitioners, protocol designers, and subjects in their own master's research project. As co-authors, both gave informed consent to the use of their somatic and affective data in this paper. No third-party participants were involved. The research was conducted in accordance with principles of relational accountability and participant autonomy consistent with participatory action research ethics.

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Author contributions

MS, LM, and ZLW jointly conceptualized the study and developed the methodology. LM and ZLW conducted the investigation, including the design and implementation of the somatic research protocol and data collection. MS led the formal analysis, software development, and writing of the original draft. Data curation was shared between LM and MS. All three authors contributed to writing, review, and editing, as well as to the visualization of results. MS supervised the research.

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