

AYA - I AM NOT AFRAID OF YOU: combining assessment tools for evaluating a theatre of the oppressed workshop for the empowerment of young women living in Portugal.

ABSTRACT

This interdisciplinary study investigates the transformative potential of the "Aya – I'm Not Afraid of You" ("Aya - Não tenho medo de ti") workshop, an innovative program that employs Theater of the Oppressed techniques to enhance well-being and empower young women. Participants engaged in collaborative and expressive activities to address and reframe experiences of oppression, fostering personal growth and collective resilience. A comprehensive mixed-method evaluation—integrating qualitative reflections, observational insights, surveys, and psychophysiological data—assessed the workshop's influence on emotional well-being, reduction of reactivity, and empowerment. The workshop took place in Porto, Portugal, with a small, purposefully selected sample of nine young lusophone women, Portuguese and Brazilian nationalities. While small in scale and diversity, the study demonstrates how such assessments can be adapted across cultural contexts. Results indicated improvements in well-being and embodied emotional indicators.

KEYWORDS

Artistic and Creative Activities; Theater of the Oppressed; Physiological Reactivity; Empowerment; Participatory Theatres; Assessment and Evaluation of Artistic Practices.

Traditionally, art mediates with its audience through the experience of the finished work. A deeper form of mediation occurs when artists invite public participation in the creative process, sharing control over its development. This co-creation holds aesthetic, personal, and social transformative potential. Interventions that involve participants in collective artistic and creative activities (ACA) can serve as tools for social change.

This article presents the design, implementation, and impact assessment of Aya [1], a one-day workshop based on Theatre of the Oppressed (TO) [2] and Aesthetics of the Oppressed (AO) [3], aimed at empowering lusophone women in higher education in Portugal.

Progress in these types of practices is measured not only through agency, but also through psychological and emotional transformations. As Kundu [4] notes, "Theatre cannot provide instant transformations, but it is within its parameters to enable people to view things critically, build awareness on various issues, and practice alternatives to negative behaviour in safe spaces before carrying them out in real life" [5]. Such processes can foster collective knowledge, critical thinking, and the ability to connect personal experiences with broader structural issues, bridging reflection, evaluation, and action.

This study employed a case-study approach centered on a one-day workshop with a group of women in Porto. The study used a mixed-methods and art-based research design. We assessed the impact of the workshop using quantitative and qualitative tools. Physiological data provided objective data, while reflection sessions, open-ended surveys, and observational notes revealed the subjective and embodied dimensions of the participants' engagement in the art-based process. This paper discusses how TO practices may enhance empathy, promote well-being, and

increase the perception of empowerment, positioning them as meaningful strategies within the realm of art-based interventions.

This workshop and its evaluation protocol stem from an ongoing collaboration between artists and neuroscientists, committed to exploring how artistic and creative activities (ACA) can drive transformation. We design interventions and test tools to assess their impact. As facilitators, we witness participants' transformation firsthand; as researchers, we are challenged to critically examine this process. Is the transformation lasting? Which practices are most effective? How can we assess the impact of something as complex and subjective as ACA for social transformation (ACA-ST)?

In the case of Aya, we asked: how can we evaluate participants' experience with TO while (a) avoiding the instrumentalization of art, (b) respecting its subjectivity, and (c) addressing the complexity of empowerment?

We begin with the premise that TO is inherently participatory and transformative, offering a collaborative way to explore oppression and envision alternatives [3,6].

Additionally, art-based interventions, such as these — increasingly explored within the field of neuroscience — have been recognized as powerful tools for enhancing reflection, creativity, interpersonal understanding, and compassion, in diverse settings [7].

Although this study is preliminary and exploratory, by using well-established, robust, widely used, and relatively inexpensive methods one can measure and analyze heart-brain axis relationship and how it can reflect cognitive-affective states.

The detailed workshop and evaluation protocol are designed for replication and adaptation in other contexts. By publishing this work, we aim to support the validation of these tools by other facilitators and researchers in ACA-ST.

This paper presents both the conceptual foundations and methodological approach behind Aya, with a focus on preserving aesthetic integrity while ensuring evaluative clarity and applicability.

1. THEORETICAL FRAMEWORK

The development of this workshop involved research on three main topics: TO ; Audience Studies through Neurosciences; and Empowerment and Agency studies. It represents a preliminary investigation combining research into empowerment, the measurement of psychophysiological data, and artistic practice within the aesthetic of the oppressed. Its objective is to outline initial findings addressing these gaps while providing methods that enable the workshop to be replicated in diverse contexts.

We explore concepts like empowerment, agency, and oppression [2,6,8,9], linking them to audience studies [10,11], designing a theoretical base to experiment with new spectatorship measurement methodologies.

TO, created by Augusto Boal [2], includes the Aesthetics of the Oppressed, defined as “a project about helping the oppressed (...) to create their artistic metaphors of their world” [12]. It is a set of theater techniques designed to empower both artists and non-artists by providing the means of artistic production to oppressed individuals, using art as a tool to raise awareness about oppression.

The practice of TO has gained global recognition and is widely adopted by engaged communities. The Forum-Theater (FT), one of its key practices, invites the audience to participate as actors—called "spect-actors".

The workshop was designed according to Augusto Boal's [2] aesthetics [3] and organizational proposals, including its main stages, as detailed in the following section.

Collaborating with Freire [9], Augusto Boal adapted these ideas to the arts, creating spaces for participants to critically examine reality and explore radical change through experimentation. Studies grounded in Boal and Freire’s work demonstrate how such practices can intentionally generate complexity among participants [13] allowing for the use of symbolism and layered meanings in performance, thus enabling participants to critique oppressive situations without directly confronting authority figures [14]. Dialogue and active listening are central, with the facilitator being both a mediator and a pedagogue. Conceição [15] reinforces the need for the creation of safe spaces - where all ideas are considered and listening is prioritized – for the sharing of oppression and injustice stories . Building such spaces and understanding how TO techniques can contribute to this process is exactly where neuroscience can offer valuable insights.

According to neuroaesthetics [10], aesthetic experiences emerge from the interaction of sensory-motor, emotion-valuation, and meaning-making neural systems. The first processes sensory input, the second evaluates its emotional relevance, and the third offers contextual and cultural interpretation, shaping how we perceive art [16]. Historically, experiencing art elicits emotional, empathetic, and physical responses, an evolutionary tendency to find aesthetic experiences “rewarding,” fostering social connection and communication [17,18]. Mirror neurons play a key role in this process, allowing viewers to simulate the actions and emotions portrayed in artworks, a mechanism known as embodied simulation [19,20].

Aesthetic experiences activate brain regions involved in empathy, pleasure, and cognitive-affective processing, including the anterior cingulate, orbitofrontal cortex, and medial/dorsolateral prefrontal cortices [21,22]. Although peripheral physiological measures do not capture direct neural activity, they reliably reflect emotional-cognitive states. Electrodermal activity (EDA) indicates sympathetic arousal in response to emotional stimuli [16,23,46], while heart rate (HR) is linked to emotional appraisal, regulation and decision-making [24—27,47]. These signals are sensitive to aesthetic and emotional engagement and have shown promise in supporting well-being and stress reduction [21,22,28,29].

These concepts reinforce the embodied nature of participatory art forms such as TO. Boal’s idea of the “spect-actor”, one who acts and reflects simultaneously, aligns with this embodied engagement. In Forum Theatre (FT), participants rehearse actions and co-construct meaning, activating neural circuits related to empathy, agency and collective action [2,18,19]. Rizzolatti [20] emphasizes that spectatorship is not passive: the spectator, through embodied processes, “feels” with the actor, transforming observation into shared experience.

Neuroaesthetics thus offers a scientific bridge between art and cognition, highlighting the evolutionary and emotional significance of aesthetic experiences [18]. Despite individual variability, they consistently engage reward-related regions, enhancing cognitive and emotional integration [18,19].

TO invites the audience into a process of embodied reflection, offering a safe, collective space for articulating and transforming experiences of oppression. Empowerment, defined as the ability to make and act on choices [2,8,9,30--33], is central. Research shows that participatory art practices, including FT, promote empowerment across diverse contexts: from socio-environmental conflicts [34] to empathy-building in medical education [35,36]. As Cohen-Cruz [37] notes, TO rehearses transformation, aligning aesthetic experience with real-world change [37], a core objective of the Aya workshop.

“Empowerment” is understood as the process of giving someone the power to make choices for themselves [30--32] breaking the culture of silence about oppression, and raising the consciousness of the exploited about their oppression. [2,9]

Empowerment studies [8,33] show that while empowerment is always contextual, depending on social, demographic, personal, and political contexts, it is not unattainable. On the contrary, once the space-time of a group of people has been defined, it is possible to measure their empowerment and, based on these measurements, to offer tools so that each person, within their reality, can increase their capacity to make and act on choices, increasing their capacity for agency.

Recent studies highlight how participatory art practices, particularly those based on Theatre of the Oppressed (TO), can promote empowerment across diverse contexts. Miramont et al. [34] show how Forum Theatre (FT) fosters conflict resolution and collective agency in socio-environmental struggles in Bolivia. Other examples include online FT with medical students engaging empathetically with domestic abuse survivors [35], and the use of comics to help patients reflect on agency in abusive healthcare settings [36]. Cohen-Cruz [37] frames participatory performance as a dialogical process aligned with Boal’s idea of the “spect-actor,” where aesthetic engagement rehearses real-world transformation [37].

These contributions reinforce TO’s relevance in empowerment-focused interventions and align directly with the goals of the Aya workshop.

2. METHODS

Faced with the challenge of designing an ACA-ST intervention to empower young women through the Aesthetics of the Oppressed, we developed the workshop and assessment tools in parallel.

Aesthetically, the goal was to collaboratively create two final theatre sketches (one per group) to be performed in a forum setting. Throughout the workshop, participants developed scenes based on everyday experiences of oppression, portraying both oppressors and oppressed, and strategies for resistance and empowerment. All scenes used the FT method [15], with the facilitator pausing the action to invite the audience to replace actors and propose alternative outcomes. Participants took on multiple roles—scriptwriters, scenographers, performers, spectators, and spect-actors—experiencing the creative process from varied perspectives.

To assess the workshop’s impact, we applied six complementary instruments. These tools were designed to be sensitive to FT dynamics, capturing participants’ emotional and behavioral responses across shifting roles and moments. A detailed overview is provided in the assessment protocol section.

2.1 WORKSHOP DESCRIPTION

The workshop was held in July 2024 (9:30 AM–5:00 PM) in a room equipped for observation and creative activities, including props, art materials and a ceiling-mounted fisheye camera for recording. After consent forms, baseline measures, and initial surveys, we began the TO activities.

Following Augusto Boal’s organization [38], on “Stage 1: Knowing the body”, the participants were involved in games of rhythms and body movements (Fig. 1 a)



Figure 1- Some stages of the workshop. Clockwise reading: a) Stage1: Knowing the body; b) Stage2: Making the body expressive; c) Stage3: Simultaneous dramaturgy; d) Stage3: Image theatre; e) Stage3: Forum theatre; f) Stage4: Theatre as discourse

By “Stage 2: Making the Body Expressive” there were activities to notice details in the participant’s daily life which informed the creation of the first scenes and the exploration of dramaturgy possibilities (Fig.1 b)

During “Stage3: Theatre as Language”, participants began to discover theatre as an expressive language in three levels : they listened to songs, translated them to images and texts (Fig. 1 c); discussed the themes and created scenes, first in image theatre (sequence of static images) (Fig.1 d); and after giving “life” to them, acting in a simultaneous dramaturgy (Fig1. e). “Stage 4: Theatre as Discourse” implied the creation of scenes in a FT format (Fig 1. f).

These activities promoted collaborative problem-solving and reflection on social dynamics, grounded in participants’ lived experiences. After each activity, the facilitator led a reflective discussion to deepen learning.

Sociodemographic information, details of the participant call, and consent procedures are available in the supplemental material. [39]

2.2 ASSESSMENT PROTOCOL DESCRIPTION

Our team has been adapting, evolving, and combining various instruments for transformation and impact measurement. Our goal is to develop an assessment toolkit/protocol for artists to use in ACA-ST or other creating-with experiences. This process is iterative: with each new intervention, we add measurement tools and observe how they validate, contradict, or complement existing data. For the Aya workshop, we included psychophysiological data to gain deeper insights into participants’ physiological and emotional states. These measures help bridge the gap between subjective self-reports and objective physiological markers, offering richer insights into human experiences and behavioral change.

The Aya workshop achieved an assessment level combining all initially defined relevant data types: quantitative and qualitative; self-report and hetero-report; subjective and objective (Table 4). All these tools are detailed in the supplemental material file [40]

Table 4. Assessment tools Aya workshop

Instrument	Type of data	Reading	Report	Variant
Discussion/ Group-reflection	Qualitative	Subjective	Self-report	Oral, group, talking
Observation Sheet	Mixed	Subjective	Third-party report	Written, defined moments (8), defined variables
Video recording	Qualitative	Objective	none	Used to verify timeline
Survey Empowerment	Mixed	Subjective	Self-report	Empowerment scale, written survey
Survey workshop perception	mixed	Subjective	Self-report	written survey
Biosensors	Psychophysiological measures/ Quantitative	Objective	none	Heart rate and electrodermal activity

Each participant was identified solely by the color of her wrist ribbon (Fig. 2), ensuring anonymity while allowing precise correlation between tool readings. The empowerment surveys were also anonymized using coded identifiers to protect privacy, while enabling comparison across surveys and datasets.

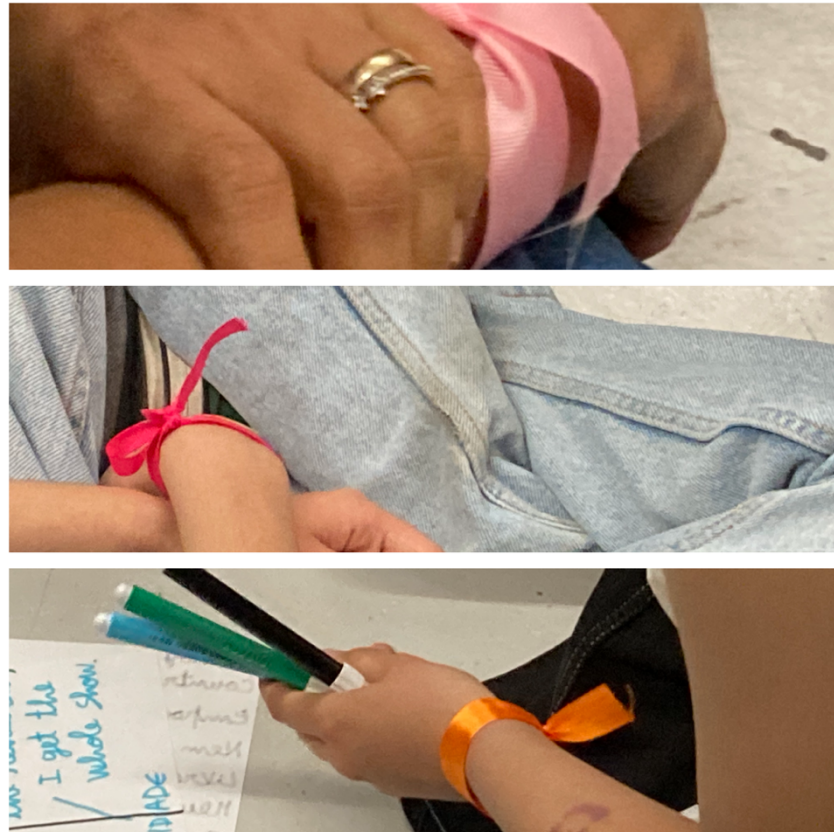


Figure 2- Identification through colored ribbons

Protocol sequence for this assessment is described in supplemental material file. [41]

3. RESULTS

3.1 PRINCIPAL RESULTS

The inclusion of biosensors has significantly enhanced our assessment capabilities, and we recommend their integration into future evaluation protocols. As peripheral measures, biosensors reliably complement self-reports, revealing lower-than-expected engagement or, conversely, decreases in EDA and HR that may indicate empathy and commitment. This complementarity strengthens confidence in our findings. Video footage was also essential for aligning observation sheets with psychophysiological data, and we strongly recommend its continued use.

3.2 EMPOWERMENT LEVELS

Empowerment levels were assessed using an eighteen-statement survey based on research into women’s and psychological empowerment [31,32,41]. Following the original design, assessments occurred twice: on the workshop day and one month later. We analyzed matched responses using the Wilcoxon signed-rank test [43], suitable for small, non-parametric paired samples. The results, summarized in Table 5, showed both statistically and marginally significant findings. This integrated, context-sensitive approach aligns with best practices, recognizing empowerment as a multi-dimensional concept deeply rooted in the cultural and social realities of women’s lives. Thus, the survey results reflect these complex and interconnected dimensions.

Table 5- Significant Results in Empowerment Surveys

Question	Initial Mean	Follow-up Mean	Difference	P-value	Trend	Significance Level	Statistical Result
As a teenager, I had access to sex education and contraception.	4,86	3	-1,86	0,0422	decrease	significant ($p < 0.05$)	w=0.00, p=0.042, r=0.77
I have the feeling that I can go wherever I want	3,86	2,43	-1,43	0,0571	decrease	near-significant ($0.05 \leq p < 0.10$)	w=1.50, p=0.057, r=0.72
I’m not afraid to walk down the dark street alone.	1,57	3	1,43	0,0781	increase	near-significant ($0.05 \leq p < 0.10$)	w=3.00, p=0.078, r=0.67

In the empowerment survey, the first statement showed a significant result ($<0,05$) from the initial to the follow-up survey. The second statement yielded a near-significant result (0,571). Both affirmations exhibited a decrease from the first to the second measurement. The third statement also showed near to significant results (0,0781) but, in contrast, presented an increase in data from the first to the second survey.

3.3 INFLUENCE IN PRACTICE

To identify areas of lowest empowerment, we analyzed only the initial survey. Median scores for each question were calculated, and the five lowest were selected (Table 6). We also examined the interquartile range (IQR) to assess response variability, highlighting areas where respondents felt less empowered and where opinions were more divided.

Table 6. Survey Empowerment individual analysis

Topic	Statement	Median	IQR	Interpretation
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Safety Concerns	"I'm not afraid to walk alone in a dark street"	1.0	2.0	Generally low feelings of safety with high variability, indicating that personal safety is a concern.
Financial Independence	" I am the main responsible to maintain my home financially."	1.0	0.0	Consistent low levels of financial independence, suggesting dependency or shared financial roles.
Gender Wage Gap Perception	" If I were a man, it would be enough to earn more money in my job."	2.0	-	Perceived gender-based wage discrimination, with participants believing that gender affects earnings.
Body Image Issues	" I've never had body image issues."	2.0	2.0	Generally negative body image experiences, with significant variability across participants.
Childhood Gender Inequality	" When I was a child/teenager, my brothers and my boyfriends had the same permission to go out with friends as I did."	2.0	2.0	Varied but generally restrictive experiences, indicating gender-based freedom differences in youth.

Post-analysis showed that the empowerment survey identified the same oppressive issues that arose in improvised scenes. This suggests that TO's safe space encourages participants to express genuine experiences of oppression, even through games and indirect methods. While it's unclear if this leads to tangible life changes—since broader social transformations are needed—the results are promising.

Regarding the psychophysiological data, despite the small sample size, the findings are intriguing. Tables 7 and 8 present average and percentage EDA and HR measurements at three key workshop moments: baseline upon arrival, the initial phase during participant introductions, and during scene performances.

Table 7. EDA and HR average measures in key moments

	1) baseline	2) introduction	3) workshop
EDA (μ S)	5,34	11,6	8,55
HR (bmp)	70,78	84,12	80,98

Table 8. Variation in percentage from 1) baseline to 2) introduction and to 3) workshop

	1) Baseline	2) introduction	3) workshop
EDA	5,34 (μ S)	117,08%	59,94%
HR	70,78 (bmp)	18,84%	14,40%

We observed the following trends: average EDA was 5.34 μ S at baseline, rising significantly to 11.6 μ S during introductions - a 117% increase. During scene representations, EDA averaged 8.55 μ S, a moderate 59.94% increase from baseline. Heart rate started at 70.78 bpm, increased to 84.12

bpm during introductions (18.4%), then averaged 80.98 bpm (14,4% increase) for the rest of the workshop.

This stabilization of EDA and HR may indicate a physiologically stable yet engaged state, reflecting adaptive emotional processing after initial heightened reactivity. Together with qualitative data, this suggests an embodied session experience. If sustained, such regulated engagement could positively impact psychological well-being, as supported by previous studies [22].

3.4. QUALITATIVE ANALYSIS

The qualitative analysis, in accordance with Creswell’s [44] employed a mixed inductive–deductive approach for thematic analysis. This approach allowed us to examine recurring patterns across participants’ responses considering both *a priori* codes, derived from key theoretical constructs, and emergent themes, grounded in the participants’ subjective experiences, to guide our reading and interpretation.

Theme	Presence	Change over surveys
Call-to-Action & Community Connection	Strong	Strongly foregrounded in scene descriptions
Personal Relevance	High	Remained high; participants continued to relate the workshop to daily life
Creativity/Expression	Moderate	Became slightly more prominent in written reflections
Emotional Impact	Moderate	Became slightly more prominent in written reflections
Social-Justice/Gender References	moderate	Stayed constant across both survey moments

While limited in depth due to its rapid-scan format, the consideration of qualitative data enabled us to identify patterns of resonance and transversal themes concerning the TO experience. These initial findings may serve as a foundation for deeper exploration in future phases.

4. DISCUSSION

This study explored how TO practices, integrated with an interdisciplinary assessment protocol, can foster empowerment and well-being among young women in Portugal. Despite its exploratory nature, our findings offer valuable insights into the potential of participatory art-based interventions when paired with sensitive evaluation tools.

While EDA and HR measure stress responses rather than empowerment directly, they capture complex dimensions such as emotional regulation during challenging activities. The observed trends align with the research objectives, offering valuable support for the study's goals.

Data indicates participants experienced elevated stress during the introduction phase—likely due to group dynamics, self-presentation, and adjusting to unfamiliar tasks. In contrast, stress levels decreased during scene representations, suggesting increased psychological safety. This shift reflects growing confidence and comfort in expressing themselves within the group, demonstrating the effectiveness of TO techniques in fostering a safe space for raising awareness and discussing oppression.

Combining this data with open-ended survey responses, we found that participants reported being impacted by the FT scenes and discussions on oppression—some even re-enacted personal experiences. Most importantly, the workshop successfully encouraged participants to act. This study also focused on the temporal dynamics of physiological indicators, offering valuable insights into participants' emotional regulation and engagement throughout the workshop. Our approach adds to the growing body of research supporting process-focused, context-sensitive measures in art-based interventions [18]. As shown in studies like Ando and Ito [45], EDA and HR are sensitive to short-term autonomic fluctuations and capture real-time changes in psychophysiological states. This highlights the importance of within-session monitoring in creative, participatory contexts, offering deeper understanding of how participants navigate stress and engagement. Future research should incorporate post-session physiological assessments to examine lasting effects related to empowerment and well-being.

5. CONCLUSIONS

The outcomes in artistic expressiveness and self-analysis for empowerment were productive, generating multiple outputs within the arts research field. However, it is not feasible to address all resulting issues in a single instance.

TO practices effectively brought experiences of oppression to the stage and equipped non-artists with tools for artistic creation, while also fostering awareness and emotional well-being—all without compromising performance quality.

Results revealed a reduction in reactivity compared to the initial moment, though still elevated relative to baseline. This peak during the introduction followed by psychophysiological stabilization aligns with patterns of cognitive and emotional engagement—hallmarks of embodied experience in participatory theatre. This may also reflect empathic positioning, where participants emotionally connect to the themes while maintaining reflective distance. Subjective reports reinforce this, noting personal relevance, emotional impact, and creative expression during retrospective reflections. These patterns underscore emotional resonance and embodied empathy, key mechanisms in

participatory theatre. When practiced long-term and with appropriate facilitation, such approaches can support prosocial awareness and meaningful community-based change.

Though the AYA workshop occurred in a specific, small-scale context with Lusophone women in Portugal, findings indicate emotional engagement, increased agency, and embodied reflection. While not statistically generalizable, these outcomes affirm the value of this methodological approach in similar settings. The AYA workshop thus serves as a meaningful example of how localized, artistically driven practices can inform global conversations on empowerment, well-being, and social transformation.

1. FUTURE WORK

While the study presents promising results, future research will refine several aspects. Expanding the participant pool will strengthen statistical validity and allow for a control group. The integration of real-time psychophysiological data with video footage should be explored more incisively, as it can greatly enhance synchronization and interpretation of physiological peaks. Improved survey design will enable participants to connect specific situations to physiological responses. This combined approach would offer deeper insights into how individual experiences and workshop dynamics influence emotional and physical states, further enriching the study's findings.

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