MindSpace: Improving Relaxation Break and Performance Using a Device Exterting Tactile Sensation of Life-like Breathing Movement with Squeeze-like Deep Touch Pressure on Users' Upper Chest Area

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Figure 1: Movement of MindSpace captured still - Exerting tactile sensation of life-like breathing movement with squeeze-like deep touch pressure on users' upper chest area.

Abstract

We introduce *MindSpace*, a pneumatically controlled haptic device that simulates gentle, life-like breathing combined with providing a deep touch sensation. Designed as a *focusing agent*, MindSpace aims to enhance users' short relaxation breaks, promoting mental clarity, and stress reduction. In a within-subject study (N = 22), we compared rest conditions with and without the device. Our findings provide initial evidence that MindSpace can effectively induce relaxation, increase environmental and bodily awareness, and improve post-break responsiveness. Participants reported that taking short breaks with MindSpace improved physical ease and mental calmness, thus overall relaxation and productivity. Built on prior works, MindSpace integrates slow tactile breathing rhythms with deep pressure, offering a novel multi-sensory approach tailored for micro-break relaxation.

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CCS Concepts

• **Human-centered computing → User studies**.

Keywords

short relaxation break, soft haptics, pneumatic actuator, deep touch pressure, interface design

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1 Introduction

In today's increasingly digital world, the boundary between work and relaxation has become progressively blurred. Remote work arrangements, constant connectivity through smartphones, and the normalization of being "always available" have eroded the traditional separation between professional and personal spaces [22]. Many professionals check emails during dinner, answer work calls on weekends, or complete projects in bed before sleep [16]. Meanwhile, relaxation activities often become interrupted by work notifications [26], and homes—once sanctuaries from professional demands—now frequently double as offices. This continuous overlap creates a state where individuals are neither fully working nor fully resting, potentially contributing to heightened stress levels, diminished productivity, and difficulty achieving genuine relaxation [26]. The integration of work into every aspect of life has created a new challenge for maintaining mental health and well-being, with many struggling to establish boundaries that allow for true recovery and rejuvenation [14, 54, 56].

Micro-breaks —brief pauses lasting several minutes— serve as tools for restoring depleted attention and cognitive resources. Research demonstrates that these short intervals provide the brain with necessary respite from sustained mental effort, effectively preventing the deterioration of performance that typically accompanies prolonged focus [46, 48, 68]. Not only do micro-breaks enhance overall well-being and performance, but carefully structured relaxation breaks demonstrably reduce the perceptual load of information processing and activate the *relaxation response* — a physiological state controlled by the parasympathetic nervous system within the broader autonomic nervous system. This vital regulatory system governs essential functions across internal organs and has proven to be remarkably effective in addressing stress symptoms through measurable physiological changes: lowering heart rate, decreasing blood pressure, relaxing muscle tension, and normalizing breathing patterns. Research indicates that even brief activation of this system can interrupt stress cycles, allowing the body and mind to reset from heightened alertness to a calmer, more sustainable state of functioning [5, 6, 24, 39, 60, 79].

Despite growing evidence of the benefits of micro-breaks, a recurring challenge is how to help people enter a truly restorative state within the limited time of the break. Prior work has explored strategies to support break-taking, including nudging systems [15, 51] and rhythmic scheduling methods like the Pomodoro Technique [23]. However, the quality of the break itself—what one *does* during a break—remains a critical, underexplored dimension. In particular, inducing a felt sense of calm and presence often requires more than visual or auditory stimuli alone.

Recent studies have begun investigating the role of the body — through tactile and somatic interaction — to enable deeper relaxation. Deep touch pressure, for instance, has shown positive calming effects [2, 17, 32, 74] in both clinical and non-clinical contexts, where users experience a firm tactile sensory input widely known to treat problems of oversensitivity to touch and nervousness for children with autism spectrum disorder and ADHD (Attention-Deficit Hyperactivity Disorder) [17, 32]. And haptic technologies have started to simulate these sensations for everyday users [2, 74]. At the same time, guided slow breathing has been shown to support emotion regulation, focus, and stress recovery [20, 79, 96].

However, the combination of **haptic pressure** and **breathing rhythm**—particularly in tactile form—remains relatively underexplored in the design of micro-break experiences. This opens a compelling design space for multimodal, embodied relaxation aids that go beyond traditional screen-based wellness tools.

In this paper, we introduce *MindSpace*, a pneumatically controlled device that delivers synchronized deep pressure and lifelike slow breathing to the user's upper chest. Grounded in physiological and interaction design principles, MindSpace acts as a physical "focusing agent" to guide the user into a more relaxed and embodied state during short breaks. Through its tactile rhythm, the device enables users to reconnect with their breath and bodily awareness, potentially increasing relaxation depth and post-break responsiveness.

This study addresses the following research questions:

RQ1: Can the combination of deep touch pressure and lifelike breathing rhythm enhance users' relaxation response during short breaks?

RQ2: How does this embodied tactile experience affect the subsequent cognitive workload and task performance?

To address these questions, we present (1) the design and implementation of the *MindSpace* prototype, (2) a within-subject user study (N = 22) comparing break experiences with and without the device, using both physiological and subjective measures, and (3) insights into how haptic breathing feedback supports relaxation and work recovery, contributing to the broader design of restorative workplace technologies.

2 Related Works

A wide range of prior research has investigated how breathing techniques, tactile feedback, and multisensory systems contribute to stress reduction and relaxation [11, 12, 36, 40, 49, 66, 86, 91, 92]. For example, Haynes et al. [36] developed a breathing cushion that reduced participants' anxiety during an anxiety-inducing test. In contrast, our work focuses on relaxation during breaks, i.e. in situations that serve the purpose of relaxation, and not on relaxation in stressful situations. Therefore, our research synthesizes multiple therapeutic approaches through an innovative tactile device that uniquely combines slow breathing rhythms with deep pressure application, specifically designed to optimize short relaxation breaks. This integration addresses a significant gap in existing relaxation technologies. To contextualize our contribution within the broader scientific landscape, we have organized the relevant literature into three distinct but interconnected domains discussed below.

2.1 Breathing-based Relaxation Interfaces

Breathing regulation serves as a foundational mechanism for emotional self-regulation and parasympathetic nervous system activation. An extensive body of research has consistently demonstrated that slow-paced, guided breathing patterns significantly reduce physiological stress markers while enhancing measurable relaxation states [36]. The deliberate modulation of breath—typically slowing respiratory rates to 4-6 cycles per minute—triggers a cascade of autonomic responses that counteract the body's stress reactions, including decreased cortisol production, lowered blood pressure, and increased heart rate variability, all reliable indicators of improved parasympathetic tone [21, 49, 50, 53, 94, 96]. For instance, Sefidgar et al. demonstrated that a breathing, fluffy robot could lower heart rate and respiration rate, leading participants to feel "calmer and happier" [74]. Similarly, Asadi et al. found that a slow-breathing soft interface had a calming effect, potentially alleviating the "fight-or-flight" [2].

Digital interventions have adopted breathing-focused interactions to guide users toward mindful states, often through auditory or visual feedback [20, 21, 96]. For example, Zhu et al. [96] developed a mobile mindfulness application with breathing guidance, while Chittaro et al. [21] demonstrated that breathing tasks with real-time biofeedback in VR outperformed visual-only conditions in reducing physiological arousal, that were superior to placebo biofeedback [20]. These systems primarily employ auditory or visual cues, whereas our work explores the role of tactile breathing guidance, offering a novel sensory channel for supporting micro-breaks.

Beyond screen-based feedback, physical interfaces have emerged as a promising medium for breathing guidance. Systems like *Sonic Cradle* [76, 87] and earbuds-based *Breathing Buddies* [69, 70], smartwatch-based Mindfulwatch [35] create immersive or embodied interactions through respiration-mapped soundscapes [63] or tangible devices. However, these systems primarily rely on ambient or audiovisual metaphors, whereas our work utilizes **tactile breathing feedback** to guide users toward a relaxation state in a physically felt, embodied way.

2.2 Deep Touch Pressure and Haptic Feedback in Stress Reduction

Physical interactions with human or animal-like, tangible, breathing devices can increase user engagement and relaxation [27, 29, 61, 75, 93, 94]. Built on the prior works, it is found that deep pressure stimulation—such as hugging, squeezing, or firm tactile contact—has long been shown to induce calming effects, particularly by modulating sensory integration and down regulating the sympathetic nervous system [17, 32]. This effect has been explored in weighted blankets, hugging vests [28], and therapeutic furniture [82], offering reliable support for users experiencing stress, sensory overload, or restlessness.

In HCI, haptic feedback systems have been designed to simulate comforting touch. "Good Vibes" [45] explored dynamic vibration patterns to mimic human touch for stress relief, and "HaptiVest" [30] provided emotional haptic cues in VR contexts. While some of these systems emphasize biofeedback-driven actuation [95], they rarely integrate rhythmic patterns that synchronize with respiration.

Our work builds on this by designing a **combined slow breathing and pressure interface** to evoke the calming effect of deep-touch tactile stimulation, particularly applied to the chest—a region associated with both physiological breathing and emotional expression.

2.3 Multisensory, Somatic, and Biofeedback-Oriented Interactions

Relaxation is not only a physiological shift but also an experiential, multisensory state. Relaxation response is proven to be evoked by limiting users' bodily movement [48] and by dominating their environmental sensory input through a 'focusing agent' [17]. To decode sensory information, systems in the autonomic nervous system undergo a sensory input processing and allow receptors in the system to be activated, specifically identify the sensory inputs such as touch, light and temperature with a sufficient intensity and longer time duration [13]. Limiting and intensifying a certain sensory input enables activity in the parasympathetic nervous system to increase, thus, engage the relaxation response [17].

Studies in VR and multisensory design emphasize that combining visual, auditory, and tactile modalities can enhance presence and reduce stress [2, 34, 62, 74, 75, 93]. However, haptic feedback remains underutilized in many commercial systems [11, 83], despite evidence that it contributes meaningfully to emotional awareness and embodied self-regulation.

Emerging somaesthetic and embodied practices, such as Middendorf Breathwork [41], emphasize internal body awareness through breath sensing and controlled movement. Deep touch pressure devices, like the squeeze machine developed by Grandin [32], have proven effective in providing a calming effect by limiting sensory input. These practices suggest that combining **somatic rhythm** (like breathing) with **external tactile reinforcement** (such as pressure or temperature) can deepen users' awareness of internal states and facilitate psychological recovery.

However, extended exposure to multisensory stimulation, as seen in environments like Hanamitsu et al.'s Synesthesia X1-2.44 [34], can overwhelm sensory input, creating a complex mix of feelings. This chair-based setup, combining auditory, haptic, and visual stimulation, demonstrated that such orchestration could help users focus on sensory processing and enhance present-moment awareness [43, 58]. In contrast to purely immersive or audio-based systems, MindSpace introduces a **physically grounding, affectively rich haptic interaction**, aiming to support users in pausing, shifting attention inward, and regaining clarity during cognitively demanding tasks. To our knowledge, few studies have explored this **integration of slow tactile breathing rhythm with deep pressure** for short relaxation breaks in everyday contexts.

3 Implementation

This section describes the key design objective, prototype design, and technical design elements of the device.

3.1 Design Objective

The purpose of the MindSpace design is to offer a short, relaxing break by combining deep touch pressure with life-like breathing stimulation, promoting relaxation and self-care. It integrates deep touch pressure and breathing feedback, both proven to calm heart rate, deepen breathing, and reduce stress [2, 92]. The design carefully considers material selection, actuator fabrication, and control systems to enhance the effectiveness of these short breaks.

3.2 Prototype Design

Figure 2: Final setup design with MindSpace, zero-gravity chair and air pump system.

The MindSpace prototype consists of three elements as illustrated in Figure 2: a) a zero-gravity chair, b) the MindSpace 'arm' and c) an air pump system. The zero-gravity chair is employed to allow users to rest in bodily relief posture [90]. The MindSpace arm is designed to calm the mind and body of the user by wrapping around their chest area and actively controlling their diaphragm through breathing feedback. The main design considerations were to provide a deep touch sensation that evenly distributes pressure, to imitate a slow breathing movement to guide the user's respiration rate, and to give the device a human-like weight to evoke a sense of safety. These objectives have been achieved in the final design, as shown in Figure 2. While previous research by Haynes et al. [36] reduced participants' anxiety by having participants hold a breathing cushion in their arms during an anxiety-inducing test, MindSpace aims to provide a calming whole-body experience during a short break.

3.3 Design Elements

MindSpace 'Arm'. The MindSpace device consists of two components: an inner pneumatic actuator and an external cover. The design of the inner pneumatic actuator was inspired by the desire to create a soft and elastic touch that would mimic a life-like feel. To achieve this, Ecoflex 00-30 was employed for its elastic properties and weight that imitate human skin and touch [78]. The inner pneumatic actuator was developed through several tutorials and prototyping iterations, ultimately resulting in a design that consists of layered silicone and an air chamber that allows air to be encapsulated to realize inflation and deflation movement to mimic a smooth breathing sensation [52, 84]. The actuator is covered on bottom side with unstretchable fabric which allows top side of the actuator to stretch and bottom side to remain its length to produce a bending motion for a more comfortable grip to the users' body. To ensure an even fit and pressure around the contact area, the pneumatic actuator is covered with an external cover and a microbeads filler layer. An adjustable belt is also attached to the cover for easy sizing to fit different body types.The design document is available under a public osf research repository: https://osf.io for your reference.

Air Pump System. An important aspect of the MindSpace design is to incorporate a breathing movement into the silicone pneumatic actuator. Initially utilized a bike pump to control the slow breathing movement, an automated air pump system was developed for the final prototype. The final design uses a combined syringe and linear actuator system to power the breathing movement of MindSpace with a programmed rhythm. The goal is to mimic the slow breathing movement with a rate of 1-6 breaths per minute, as studies have shown that this rhythm can lead to deeper breathing and a lower heart rate, thereby inducing a calming effect [3, 72, 74].

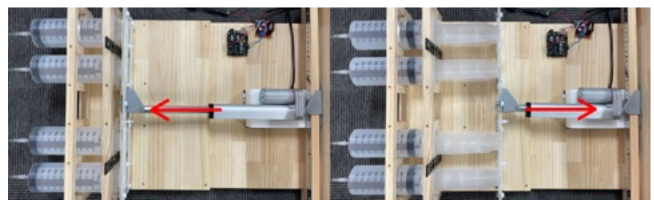

Figure 3: Combined syringe and linear actuator system: Linear actuator at position 1 on the left (extended to push in the air) and at position 0 on the right (retracted to pull out the air).

A combination of four 500ml vacuum syringe pumps and a linear actuator proves to be a suitable and powerful system for manipulating the push-pull movement required to inflate and deflate the pneumatic actuator. The four syringe pumps were used to check and pump approximately 1.8L of air into the pneumatic actuator, which is the optimum volume to provide a soft deep touch pressure with an approximate size of 60cm by 9cm by 3cm. The movement of the vacuum syringe pumps is controlled by the linear actuator, which extends and retracts its bar with a speed of 20mm/sec. The actuator is powered by a 12V input voltage with a thrust of 500N and is programmed to a slow-breathing rhythm using an additional relay module, L298N Motor Driver, and an Arduino module. The linear actuator is programmed to a rhythm of 3.33 breaths per minute, extending and retracting for 9 seconds each, to imitate a calming slow-breathing rhythm, and to provide users with a comforting deep touch pressure, as demonstrated in various studies [62, 75, 93].

4 Experiment

The purpose of this study is to evaluate the effectiveness of short rests with *MindSpace* in a **simulated workday context**, using structured proxy tasks to emulate cognitively demanding activities. Rather than testing in naturalistic settings, we designed a controlled lab-based protocol to isolate and compare relaxation and performance indicators across two break conditions. A within-subject study (N = 22) was conducted to evaluate the relaxing effect of *MindSpace* compared to rest, using both subjective self-reported questionnaire data and objective physiological data. Additionally, given previous research that shows the positive impact of breaks on focus and productivity [1, 31, 38], the study aimed to examine the relationship between relaxation breaks and work performance in an experimental setting.

Two questions are to address: Q1: What is the extent to which using *MindSpace* leads to a more calming and relaxing experience for the body and mind, compared to resting without *MindSpace*? Q2: What is the extent to which resting with *MindSpace* reduces mental workload and improves work performance, compared to resting without *MindSpace*?

4.1 Experimental Setup

The experimental study used a within-subject design, where all participants were asked to experience two conditions in a quiet room. The two conditions were: (a) resting without *MindSpace*, and (b) resting with *MindSpace* in between a mentally demanding task. In both conditions, participants were asked to adopt the same zero-gravity position with the same inclination and neutral body posture, which is known to provide relief to the body. The order of the conditions was randomized to counterbalance the treatment order and minimize any biases.

The experiment was designed to incorporate rest breaks in between "work-simulating" tasks, using the Stroop Test as the task [4]. The participants took the Stroop Test before and after the rest, and their relaxation response, cognitive load, and performance were measured using both subjective and objective methods. Participants were asked to lie down on a zero-gravity chair in a neutral, body-relieving posture. For the "rest with *MindSpace*" condition, the final prototype of *MindSpace* was placed on the upper chest area of the participants as our preliminary study (n = 10) suggested users preferred preliminary design of *MindSpace* to be placed on the upper chest area over torso and forehead area, with the edge aligned with their shoulders and adjusted to fit their body at the back by the researcher. After setting up *MindSpace*, the Combined Syringe and Linear Actuator Air Pump System activated the breathing movement pneumatically. To control the experience, participants wore soundproof headphones during both conditions, even when not using *MindSpace*, as depicted in Figure 4. The experimental setup was reviewed and approved by the ethics committee of Keio Media Design.

4.2 Participants

This study was conducted with a total of 22 participants, including 7 males and 15 females. The participants consisted of a mix of 7 working professionals and 15 students with their own daily work routines. The data from 18 participants was used for the analysis due to incomplete or minor loss in the data for 4 participants. However, the semi-structured interview data from all 22 participants was analyzed to gain a deeper understanding of their experiences, as this was the most valuable and authentic dataset from the study. A summary of the interview questions is provided in Appendix A.1, and sample questions include: “How did your mind and body feel when resting with/without the device?” and “How did you face the Stroop test before and after the rest with/without the device?”

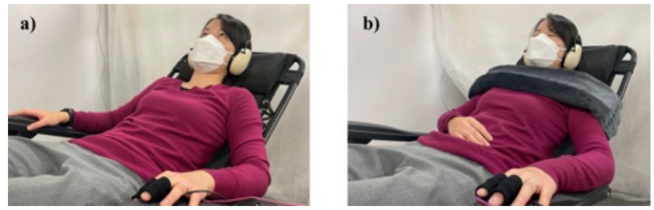

Figure 4: Experiment condition of: a) Rest *without* MindSpace, b) Rest *with* MindSpace.

For the subjective data collection, a paper-and-pen questionnaire was used. A laptop was set up to run the Stroop Test and collect its data, and a custom-built physiological sensing device developed at our lab was used to collect participants' raw BVP (Blood Volumn Pulse) and EDA (Electrodermal Activity) data. Using the custom-built physiological sensing device allowed us to (1) maintain full access to raw signal data, and (2) support flexible integration with our custom-built prototype. Before our experiment, we tested the custom-built physiological sensing device for its functionality and measuring performance.

This device, which consisted of a pulse sensor, a GSR (Galvanic Skin Response) sensor, and an ESP32-PICO Mini IoT Development Board, sent data to the laptop via the UDP (User Datagram Protocol). The setup for these sensor modalities is based on the design in some previous works [18, 19, 33, 37, 80]. The GSR and the pulse sensor data are both sampled with 100 Hz. The raw EDA data is collected by GSR sensors on the second segments of the little and ring finger. The pulse sensor is on the tip of the ring finger to collect raw BVP data. The ANONYMIZED dataset is available under a public osf research repository: https://osf.io.

4.3 Measurement

The data collected is to evaluate *MindSpace* from two main aspects: users' relaxation response and performance/workload.

4.3.1 Understanding Relaxation Response.

Relaxation represents one of the most multifaceted emotional states to accurately assess [89], necessitating a comprehensive methodological approach that integrates both subjective and objective measurement paradigms. To capture this complex phenomenon, we must simultaneously analyze self-reported experiences through validated relaxation questionnaires while correlating these findings with quantifiable physiological indicators. This dual-measurement approach provides complementary perspectives: subjective measures reveal participants' conscious experience of tension release and mental quieting, while objective physiological markers —such as heart rate variability and electrodermal activity— offer unbiased evidence of autonomic nervous system shifts toward parasympathetic dominance, thereby triangulating a more complete assessment of the relaxation response.

Relaxation Response Self-Report Questionnaire. This questionnaire is a 12-item self-report questionnaire asking how relaxed they are before and after resting with *MindSpace* or not on a 5-point Likert scale (refer to the questionnaire under a public osf research repository: https://osf.io). The questions are referred to and rephrased from Smith Relaxation States Inventory 3 [77]. By categorizing relaxation response into six factors of *Mental Quiet, Aware, At Peace, Clear, Distant and Rested* derived from Smith Relaxation States Inventory 3 [77] and adjusted for this study, two questions were categorized in each factors schema, which is associated with an agreeing statement (positive indicator) and a disagreeing statement (negative indicator) to balance and reduce the so-called "acquiescent response bias", in another words prevent a leading bias [73] as shown in Figure 5. By utilising both positive agreeing statement and negative disagreeing statement, a general relaxation response index was calculated using *(Scale of Agreeing Statement - Scale of Disagreeing Statement) ÷ 2* by giving the scale of 5 for 'Strongly Agree' and 1 for 'Strongly Disagree' from the questionnaire collected. Relaxation response index has a range of a maximum index of 2 to a minimum index of -2, where a score of 2 indicates the relaxation response is present and -2 indicates the relaxation response is absent in this study.

Interview. The objective in conducting an interview is to unveil participants' experience of rest with *MindSpace* and their detailed difference in feelings when they rested with *MindSpace* and without. This allows author to decode detailed feelings that could be a good evidence to back up their subjective and objective data. For the complete interview guide see Appendix A.1.

BVP feature from Pulse sensor. BVP features, BPM (Beats Per Minute) and HRV(Heart Rate Variability), are extracted from raw BVP data collecting from the pulse sensor. BPM, or heart rate, determines how your mind is feeling and the use of HRV has been proven to be reliable to detect relaxation or stress [47, 59]. In particular, when relaxation responses are apparent, it is expected that heart rates will calm down and see an increase in NN50, pNN50 and the mean NN interval (NN is refer to the inter-beat intervals, also named as RR intervals - the time elapsed between two successive R-waves of the signal on the electrocardiogram) [7, 67]. The mean NN interval is the mean of time between two consecutive heartbeats; the NN50 indicates the number of NN interval that differ by more than 50 milliseconds; and the pNN50 refers to the proportion of NN50 divided by the whole range of heartbeats you are looking at [42], associated with relaxation.

EDA feature from GSR sensors. EDA feature, SCR (Skin Conductance Level), is a valuable tool for measuring emotional and cognitive states [25]. As EDA is obtained through measuring SCR, it is again purely reflecting the sympathetic branch of the autonomic nervous system when an increase in EDA meaning higher arousal (activation) is observed [65]. Studies show accuracy of the data obtained through a EDA sensor is great as 89%, moreover, it is employed in this study [95]. A decrease in EDA indicates that people are experiencing lower arousal (deactivation) that reflects the opponent, the parasympathetic branch of autonomic nervous system. It is a crucial measure for understanding relaxation response with *MindSpace*, however it has to be analysed with other subjective and objective measure to determine whether a positive or a negative emotion is evoked.

4.3.2 Understanding Cognitive Load.

We use the stroop test to induce cognitive load [44]. In order to deconstruct how subjects are experiencing an increase/decrease in cognitive load, data from Stroop test before the rest and Stroop test after the rest is collected and compared for both conditions of before and after the rest without *MindSpace*, and before and after the rest with *MindSpace*.

NASA-TLX (National Aeronautics and Space Administration Task Load Index). NASA-TLX is a self-reported index of understanding users' perceived workload experienced during the Stroop test in this study. With a dimension of "Mental Demand", "Physical Demand", "Temporal Demand", "Performance", "Effort" and "Frustration", participants are asked to weight and rate the workload experienced. The NASA-TLX worksheet used in the study can be found in the Appendix. The global workload score can be from 0 (very low) to 100 (very high) and it is one of the simplest method to detect overall workload and its change over different conditions. What can be unveiled from this measure is that the higher the mean score of all 6 dimensions is, the higher the perceived workload is. Therefore, its score is utilised as a comparison for the concept validation.

BVP feature from Pulse sensor. To understand users' cognitive stress [47, 59], BPM and pNN50 are extracted from raw BVP data. In general, the lower the cognitive load is, the lower the BPM and is expected to see an increase in pNN50 [55]. In this study, BVP data for before and after the rest without *MindSpace*, and before and after the rest with *MindSpace* is collected and compared.

Stroop Test: Response Time and Correction Rate. Response time and correction rate of Stroop tests portray the work performance. Stroop test is a color and word matching test that is acknowledged as a substitute of 'mentally demanding' work that induces emotional and physiological reactivity [71]. The test consists of subjects facing repeatedly of both congruent and incongruent stimuli, where congruent stimuli are 'colored-words' that are written in the same color of the word and incongruent stimuli are 'color-words' that are written in the different color of the word. As a result, response time and correction rate could be one of the effective way to portray subjects' work performance and understand cognitive and attentional processes. For this study, the program called The Psychology Experiment Building Language (PEBL) [85] is used on a laptop and a report of response time and correction rate is automatically collected on the software that is developed by Mueller [57]. In terms of the data analysis, it was hypothesised that a reduction in reaction time and error rates will be evident when cognitive load is reduced therefore comparison was made between before and after the rest without *MindSpace*, and before and after the rest with *MindSpace*.

Interview. To understand subjects' cognitive workload and performance, subjects are asked whether they saw any changes in how they face and approach the Stroop test after the rest with *MindSpace* and without. This interview gives an insight of what was going through their mind to back up what is seen as a trend in biodata.

Factor	Agreeing Statement	Disagreeing Statement
Mental Quiet	"1. My mind is silent and calm."	"10. My mind feels overactive."
Aware	"9. Things seem fresh and new, as if I am seeing them for the first time."	"5. I have brain fog."
At Peace	"3. Nothing worries me now."	"6. I feel worried."
Clear	"4. I feel aware, focused, and clear."	"11. My mind feels cluttered."
Distant	"2. My cares and concerns seem far away."	"7. I feel overly emotional about my concerns."
Rested	"12. I feel rested and refreshed."	"8. I feel mentally exhausted and just want to rest."

Figure 5: Six relaxation response factor and its labeled questions.

4.4 Pre-processing Methods of raw BVP and EDA

We excluded 4 participants from the dataset due to the low quality of their raw data, which was affected by missing values or motion artifacts. Each participant's raw EDA data is passed through a 2^{nd} order Butterworth low-pass filter from the *scipy.signal* package [88] to cut high frequency noise above 0.5 Hz [64, 88]. In this study, we also decomposed the EDA signal into its phasic components (such as SCR) and especially focus on peaks in phasic changes, which were shown to be related to sudden aroused feelings [8] - known as EDA peaks.

HRV features, such as BPM and pNN50, are extracted from raw BVP data through a 4^{th} order Butterworth low-pass filter from the *scipy.signal* package [88] to cut high frequency noise above 3.5 Hz [64, 88]. HRV features were calculated every 1s with a two-minute sliding window. The HRV features were divided by mean RR intervals of each participant for normalization to remove baseline differences between individuals [19, 74, 75].

4.5 Procedure

As illustrated in Figure 6, the experiment follows the charted procedure. 1) Participants are given introduction about the experiment and asked to sign the informed consent for research participation. 2) Participants are then assisted to put the physiological sensing device that collects GSR and pulse for the whole duration of the experiment. Initially, a baseline physiological data is taken as for a reference to compare with other collected data during the experiment. 3) Participants are given time to rate how much relaxation they are experiencing in their mind at that moment through a self-reporting questionnaire. 4) They are given a computer-programmed version of a Stroop Test run on PEBL [85] on a laptop. In this study, "stroop-demo.pbl" test from "battery/stroop" directory of PEBL is used. First, participants are given instructions and a trial followed by 6 blocks of tasks are given and it approximately takes 4-10 minutes depending on their own pace. 5) After the completion of the Stroop Test, a standardized scale, NASA Task Load Index (NASA-TLX) scale, is given to them to rate their mental workload during the Stroop Test. 6) Participants are then offered to rest on the zero-gravity chair without or with *MindSpace* depending on the order of the set up. The slow-breathing deep touch pressure arm is wrapped around their upper-chest area for approximately 6-minute since it takes about 2 - 3 minutes for heart rate to adapt to change. 7) Participants are again asked to repeat 4) and 5) again after their 6-minute rest. 8) Lastly, participants would again be asked to rate their subjective relaxation experienced afterwards. 9) After the first part of the experiment is over, participants are given a break before resuming another experiment with condition without *MindSpace* or with *MindSpace* depending on the order of the set up.

5 Results

The study's results are divided into 'Relaxation Response' and 'Performance/Workload' categories, based on subjective and objective measures obtained from 22 participants. Statistical analyses were carried out using GraphPad Prism 9.4.0 software [81]. The findings show that a 6-minute rest with MindSpace leads to greater relaxation and increased environmental awareness compared to resting without it. Additionally, using a tactile aid during breaks helps reduce cognitive workload and improves response time. The following section discusses these results in detail, with data visualization to highlight key changes.

5.1 Relaxation Response

In order to answer the first research question of whether the rest with MindSpace could induce a more relaxation response than the rest without, the subjective and objective data is analysed.

Self-Report Questionnaire. The relaxation response questionnaire results show a significant positive trend when comparing relaxation scores before and after rest with MindSpace versus without it (Figure 7, paired t-test). The relaxation score, calculated using the formula in Section 4.4 (range: -2 to 2), was significantly higher after rest with MindSpace [$t = 2.88$, $df = 17$, $p < 0.05$] compared to without MindSpace [$t = 1.37$, $df = 17$, $p = 0.19$]. Specifically, the average relaxation score increased from 0.44 (SD = 0.72) before to 0.79 (SD = 0.43) after rest with MindSpace.

Set-up A

2 min	5 min	5 min	5 min	6 min	5 min	5 min	5 min
Experiment Intro	Pre-test Relaxation Questionnaire	Stroop Test	Post-test NASA-TLX	**Rest with** *MindSpace*	Stroop Test	Post-test NASA-TLX	Post-test Relaxation Questionnaire

Set-up B

2 min	5 min	5 min	5 min	6 min	5 min	5 min	5 min
Experiment Intro	Pre-test Relaxation Questionnaire	Stroop Test	Post-test NASA-TLX	Rest **without** *MindSpace*	Stroop Test	Post-test NASA-TLX	Post-test Relaxation Questionnaire

Figure 6: Procedure of the within-subject experimental study.

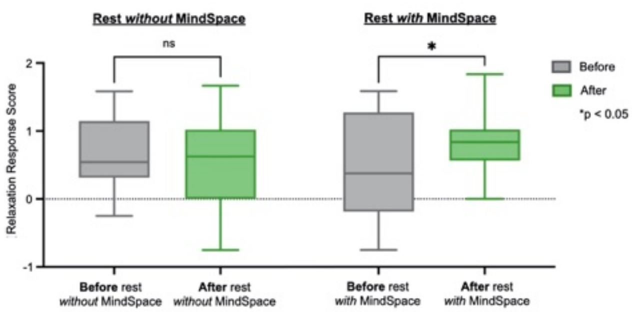

Figure 7: Box plot of t-test of average relaxation response: Before and after rest without MindSpace (t = 1.37, df = 17, p = 0.19) on the left, before and after rest with MindSpace (t = 2.88, df = 17, p < 0.05) on the right. Symbols: ns = p > 0.05; * = p < 0.05.

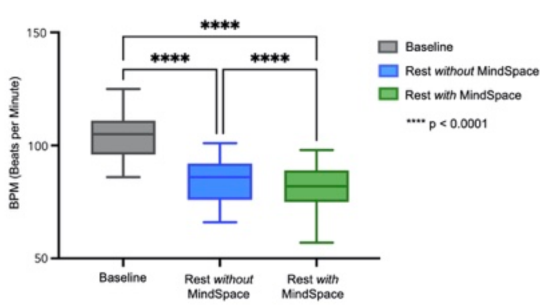

Figure 8: Box plot of BPM for baseline, rest without MindSpace and rest with MindSpace [F(2, 13452) = 7324, p < 0.0001]. Symbols: **** = p < 0.0001.

BPM and pNN50. The relaxation response in BPM, as shown in Figure 8, was analyzed using a one-way ANOVA, revealing a significant difference between baseline, rest without MindSpace, and rest with MindSpace [F(2, 13452) = 7324, p < 0.0001]. BPM was lower during rest with MindSpace (average 80.91, SD = 10.72) compared to rest without MindSpace (average 84.46, SD = 9.03), both of which were lower than the baseline (105.00, SD = 10.04). This decrease in BPM indicates an increase in relaxation, showing a positive trend.

Similarly, the relaxation response in pNN50, analyzed with a one-way ANOVA, also showed a significant difference [F(2, 13674) = 872.0, p < 0.0001]. pNN50 was higher during rest with MindSpace (average 0.045, SD = 0.022) compared to rest without MindSpace (average 0.040, SD = 0.021), both higher than the baseline (0.026, SD = 0.023). The increase in pNN50 further indicates enhanced relaxation, confirming the positive trend.

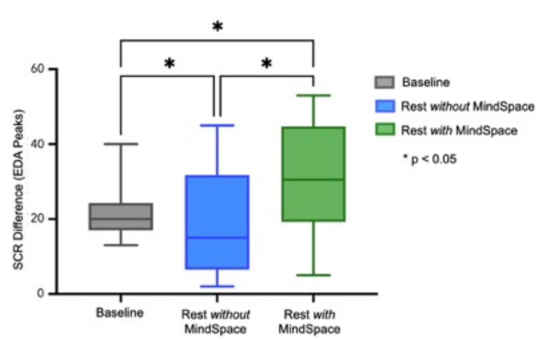

Figure 9: Box plot of SCR for baseline, rest without MindSpace and rest with MindSpace [F (1.678, 31.88) = 4.115, p < 0.05].

SCR Extracted from EDA. Relaxation response in SCR can be seen from Figure 9. A within-subject ANOVA is conducted for SCR (Average Skin Contact Response), in another words EDA peaks. The results show a significant difference for before and after the rest in general [F (1.678, 31.88) = 4.115, p < 0.05]. The descriptive analysis reveal that SCR increased from 18.85 (SD = 13.28) for rest without MindSpace to 29.80 (SD = 15.11) for rest with MindSpace. In addition, it shows a decrease of SCR from the baseline of 20.95 (SD = 6.87) to rest without MindSpace, also known as to indicate that a relaxation response is evident. However, an increase of SCR is apparent from the baseline to rest with MindSpace showing to evoked emotional arousal.

5.2 Performance/Workload

The second question touch upon the relationship between relaxation break and work performance. Findings are explained in detail in this section.

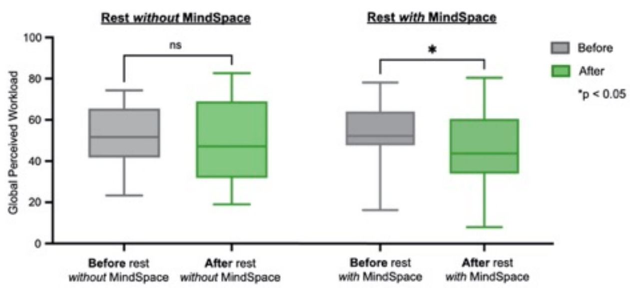

Figure 10: Box plot of t-test of average global perceived workload: a) Before and after rest without MindSpace ($t = 0.65$, df = 17, $p = 0.53$), b) Before and after rest with MindSpace ($t = 2.35$, df = 17, $p < 0.05$). Symbols: ns = $p > 0.05$; * = $p < 0.05$.

Perceived Workload Score from NASA-TLX. The overall trend in perceived workload can be seen from Figure 10. The results show a significant difference for before and after the rest with MindSpace ($t = 2.35$, df = 17, $p < 0.05$) but not for the rest without MindSpace ($t = 0.65$, df = 17, $p = 0.53$). The descriptive analysis reveal that perceived workload decreased from 52.15 (SD = 16.48) for before the rest with MindSpace to 44.69 (SD = 20.16) for after the rest with MindSpace, indicating a reduction in perceived load.

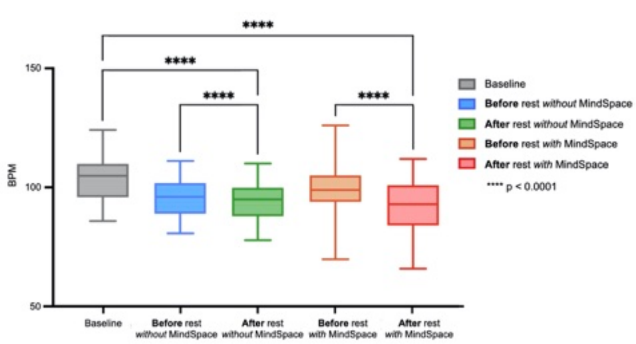

Figure 11: Box plot of BPM of 4 different Stroop test conditions [$F(4, 19483) = 950.0$, $p < 0.0001$]. Symbols: * = $p < 0.05$.

BPM and pNN50 Extracted from BVP. Cognitive workload for Stroop Test in BPM, shown in Figure 11, was analyzed using a one-way ANOVA, revealing a significant difference before and after rest, both with and without MindSpace [$F(4, 19483) = 950.0$, $p < 0.0001$]. BPM decreased from 95.81 (SD = 7.65) to 93.64 (SD = 7.86) after resting without MindSpace, and from 98.38 (SD = 10.36) to 91.84 (SD = 11.28) after resting with MindSpace. This decrease in BPM suggests deeper breathing and a calmer state post-rest, indicating a positive relaxation trend.

Cognitive workload for Stroop Test in pNN50, analyzed via one-way ANOVA, showed a significant difference before and after rest, both with and without MindSpace [$F(4, 20891) = 820.3$, $p < 0.0001$]. pNN50 increased from 0.018 (SD = 0.014) to 0.033 (SD = 0.023) after resting without MindSpace, and from 0.031 (SD = 0.023) to 0.051 (SD = 0.046) after resting with MindSpace, indicating a positive relaxation trend.

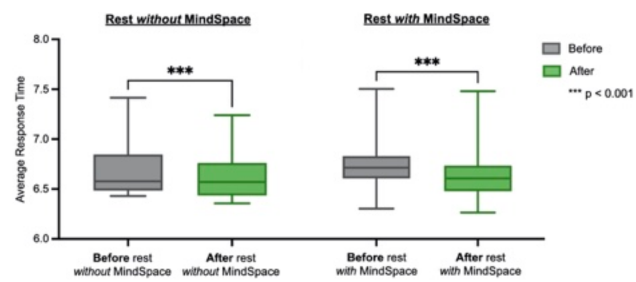

Figure 12: Box plot of t-test of average response times for the Stroop test: a) Before and after rest without MindSpace ($t = 4.29$, df = 17, $p < 0.001$), b) Before and after rest with MindSpace ($t = 4.94$, df = 17, $p < 0.001$). Symbols: *** = $p < 0.001$.

Response Times and Error Rate from Stroop Test. Significant reductions in the reaction time during the Stroop Test were observed in reaction times both after rest without MindSpace ($t = 4.29$, df = 17, $p < 0.001$) and with MindSpace ($t = 4.94$, df = 17, $p < 0.001$). Specifically, reaction time decreased from 6.74 (SD = 0.28) to 6.65 (SD = 0.28) after resting with MindSpace, and from 6.69 (SD = 0.28) to 6.63 (SD = 0.25) after resting without it, indicating improved performance and reduced perceived load.

There was a significant increase in error rate was noted after resting without MindSpace ($t = 2.839$, df = 17, $p < 0.05$), rising from 0.034 (SD = 0.023) to 0.046 (SD = 0.031). In contrast, no significant change was observed with MindSpace ($t = 1.24$, df = 17, $p = 0.23$), though the error rate slightly decreased from 0.041 (SD = 0.031) to 0.036 (SD = 0.025), suggesting that resting with MindSpace may help maintain or slightly improve performance accuracy.

5.3 Interview Analysis

To answer our research questions, we conducted a thematic analysis following the method by Braun and Clarke [9, 10]. Therefore one researcher first familiarized themselves with the participant answers by reading them repeatedly. Then, the same researcher proposed a codebook, which was then discussed with a second researcher who was also familiar with the data set.

The codebook was applied to all interviews by the first researcher, which was then verified by the second researcher. Disagreements were resolved in a review meeting. We followed the advice from Braun and Clarke, who specifically state *not* to do multiple independent codings and calculate inter coder reliability (ICR) to prove reliability [10, p.278], acknowledging the influence of the researcher on the process. After this, both researchers grouped the codes into our main themes.

5.4 Users Perceptions of Relaxation through MindSpace

The interviews confirmed that 20 out of 22 participants experienced relaxation through MindSpace. Further, the majority of our participants (N=20) perceived using MindSpace as positive. Overall participants recognized the three key design elements of MindSpace a) the slow-breathing MOVEMENT, b) the squeeze-like PRESSURE and c) the WEIGHT during the experiment. Connected to this key elements, we derived three main themes from the interviews, describing the relaxation from our participants' perspective: 1) Guided relaxation, 2) improved body and mental consciousness and 3) the similarity to human interaction.

Guided Relaxation. Participants recognized the inflating MOVEMENT of MindSpace and often depicted it as a positive experience since it guided them through the relaxation process, as P10 stated *"I felt relaxed because I don't have to consciously think about how to relax but were guided [by the movement]."*. Further, participants could more easily direct their focus on specific movements, sounds or body parts, as P19 and P3 emphasized: *"I was more aware of the movement and the small sound and things that I usually do not focus on."* (P19). P3 said, *"When I was wearing this device, I almost didn't feel other parts of my body but was just focused on what's happening around my chest-area, where the device was rested and solely focused on the rhythm."*. This helped P3 to get into a rhythmic relaxing breathing, *"I got used to it, my mind zoned out [...] and then when I got back, I realized that my breathing was following the rhythm of the device. So when the device was inflating I would inhale and when the device was deflating I would exhale and I think I felt calmer afterwards"* (P3).

Additionally to MindSpaces' MOVEMENT, its PRESSURE helped participants to relax, as P18 emphasized, *"I felt calmer and clearer because my mind wasn't thinking too much about other things. I was trying to figure out what was going on around me so how the device is squeezing me with rhythm, [...] so my focus is more on that."*.

Improved Physical and Mental Consciousness. Beyond relaxation participants experienced their posture and physical awareness to improve. As P1 said, *"[I felt] that my lungs and chest were open, which was a nice feeling. I often slouch when I'm working so I need to pause myself, and with the pressure, it felt that I was held in a nice position."*, ascribed to MindSpaces' PRESSURE. And also P6 experienced the PRESSURE to affect their physical and mental awareness positively, despite negative expectations: *"I usually don't like something lying around my chest. [...] But the device felt different. At the point when I felt the pressure and squeeze, I felt that my body is lighter and felt nice."*. Meanwhile, it has been apparent that there were some variances in the preference on how squeezed their body felt, as P11 said *" [...] I would like the pressure to be harder. Because I'm quite sensitive, if the pressure is not so strong, [...] [I felt it] itchy [...]"*, which is one the aspect that could be explored in the future studies.

Similarity to Human Interaction. Participants made several comparisons of MindSpace to human interactions or interacting with pets. The MOVEMENT reminded them of comfortable human touch, like being stroked *"I felt safe and cozy because the inflating movement felt like someone's stroking me."* (P15), or massaged *"I really enjoyed the circular almost massaging movement it was creating and I want to experience it again."* (P20). Especially the combination of PRESSURE and breathing MOVEMENT felt like a hug as P12 described, *"It's really good to have something that gives me a tightened feeling, because it [the pressure] stopped me from doing something and from moving around. [...] This allowed me to actually have a rest and a good relaxation. With a combination of breathing-moving motion, it feels really like a hug."*.

Further the WEIGHT reminded participants of a pet resting on their chest, *"With its heaviness and the breathing movement, it felt like an animal which [...] felt calming because it felt alive."* (P1). Participants from the group which first experienced rest with MindSpace before resting without it, expressed that they already missed the WEIGHT of MindSpace, *"For the second time [referring to rest without the device], it felt like some kind of weight needed to be on top of my chest. So I realized how I actually was needing this sensation."* (P13).

5.5 Users Perception of MindSpaces' Influence on Workload

Our interviews showed that 19 out of 22 participants recognized that resting with MindSpace influenced their work attitude, workload and performance in a positive way. However, three participants did not recognize any strong connection between using MindSpace and their performance as well as perceived workload. We organized participants quotes into three themes showing that participants perceived relationships between relaxation through MindSpace and a) their work attitude, b) their workload and c) their performance.

Relaxation and Work Attitude. After resting with MindSpace and getting back to the experimental work tasks, participants perceived that their work attitude changed. P2 described that their overall performance increased and they experienced less anxiety: *"I definitely performed better afterwards [...] and I would say that I didn't feel anxious."*. Also participants noticed the experienced focus while using MindSpace to persist while working, helping them to concentrate and solve their tasks, *"It's easier to stay focus after the rest with MindSpace. [...] Before the rest with it, it took me longer to stay focused on the test and I made more errors."* (P11). Furthermore, even when participants made mistakes when performing work tasks, they felt more confident and calm in handling their mistakes, as P18 summarizes: *"I felt that I can accept the mistakes [I made] and was able to handle them calmly."*.

Relaxation and Workload. Even though some participants perceived that work tasks they already felt good at become even more fulfilling after resting with MindSpace, as P16 stated: *"I recognized which tasks I'm good at and felt happier when I encountered the tasks I'm good at."*, two participant felt more exhausted after using MindSpace. P5 argued that the relaxation turned into tiredness *"After the rest, I feel like I was so calm and too relaxed so I had high* *mental pressure because I had to wake and force myself to concentrate.*". And also P7 needed bigger effort to get back to work after resting, *"After the rest [with MindSpace], I had to make a bigger effort to get [the tasks] right especially because I felt rested."*.

Relaxation and Performance. Participants experienced an increase of their performance after resting with MindSpace. They felt to be able to complete the tasks more accurate, *"I think my mind became slower but in terms of accuracy, it got better after resting with the device."* (P8), and less stressed, *"I think as it went on, I did not think too much about how to answer but almost answered with my instinct. [...] I wasn't stressed at all."* (P13).

6 Discussion

In this section, we reflect on the key findings from our study, highlighting how *MindSpace* contributes to enhancing relaxation, reducing cognitive workload, and supporting recovery during short breaks.

6.1 *MindSpace* can enhance relaxation during short rests.

Our findings indicate that *MindSpace* significantly enhances users' relaxation during short, 6-minute breaks. Both physiological data (BPM, pNN50) and self-reported relaxation responses suggested that using *MindSpace* promotes a deeper and more measurable calming effect compared to resting without the device. While resting in a neutral posture already provided some benefit, *MindSpace* consistently led to higher relaxation scores, as shown in Figure 7, indicating its added value as a tactile relaxation aid.

Additionally, electrodermal activity (SCR) revealed a nuanced physiological pattern: while rest without *MindSpace* reduced arousal, rest with *MindSpace* elicited an increase in EDA peaks, as shown in Figure 9, suggesting a distinct form of alert yet relaxed activation. This aligns with qualitative reports describing a heightened sense of awareness, comfort, and focus. Participants attributed this experience to the synchronized breathing rhythm, deep touch pressure, and weighted sensation across the chest. These findings extend existing work [2, 36], which has shown that contact with objects that mimic slow breathing can reduce stress and anxiety.

Importantly, *MindSpace* offered a form of multisensory guidance. Rather than requiring active control or focused attention, the device allowed participants to "let go" while being gently guided by the rhythmic tactile feedback. This passive yet embodied experience fostered a sense of safety and internal awareness. Despite two participants not recognizing the relaxation response, 20 out of 22 participants reported positive relaxation effects when using *MindSpace*, primarily due to the breathing movement and squeeze-like deep touch pressure, which allowed them to focus solely on the sensory information provided by the device — reinforcing the design's potential as an intuitive and nonverbal relaxation facilitator.

6.2 Tactile Breathing Rhythms Support Focus and Work Recovery

Beyond promoting relaxation, *MindSpace* also had a notable impact on perceived workload and task performance. After using *MindSpace*, participants reported significantly reduced workload on the NASA-TLX scale, and physiological measures confirmed lower stress (reduced BPM, increased pNN50) during post-break Stroop test performance.

First, taking a short break with the combination of the tactile sensation of breathing movement and deep touch pressure was found to help participants feel calmer, rested, and less overwhelmed by their workload. The objective data shows that participants experienced deeper breathing and felt calmer during the Stroop test after taking a break with *MindSpace* compared to before the break, as evidenced by the decrease in BPM and increase in pNN50. The comparison between the biodata before and after the break without *MindSpace* also suggests that the break provided a calming effect, indicating that participants were better able to handle the mentally demanding Stroop test with a less stressed body after the break, regardless of the presence of *MindSpace*.

Next, while both break conditions improved response times on the Stroop test, rest with *MindSpace* led to greater consistency and slightly fewer errors, especially when considering the median values and reduced variance. Interview data from the participants suggests that the short rest with *MindSpace* helped to increase their alertness and responsiveness, as participants reported either feeling more clear-headed or more inactive and sleepy during the rest. These results suggest that *MindSpace* may not only calm the user but also help maintain attentional clarity—key for transitioning smoothly back into work.

Lastly, the results of average perceived workload reported by the participants suggest that resting with *MindSpace* significantly reduced the score of perceived workload compared to before the rest, which plays as one of the evidences of rest with *MindSpace* being able to provide a better rest. In contrast, there were no significant difference when the score was compared between before and after the rest without *MindSpace*. During the interviews, few participants were able to verbalise how they were able to change their mindset from being anxious about performing well before the rest with *MindSpace* to being accepting to what they can do after experiencing a bodily rest with *MindSpace*. Two participants noted that the deeply relaxing experience with *MindSpace* caused them to zone out briefly, implying that the life-like breathing and deep touch pressure could facilitate "active resting," promoting calmness and a sense of recharge.

7 Limitation and Future Work

External Factors. We did not control for external factors such as caffeine intake that might have influenced the biodata. To counteract such effects, we collected baseline physiological data from each participant at the beginning as a reference to compare with the other data collected during the experiment.

Individual Breathing Rates. The linear actuator in the air pump system had limitations, with the 9-second inflate-deflate rhythm being the best setting available, which may not align with each user's preferred tempo. Future research should explore different breathing and haptic patterns, and investigate how biofeedback-driven haptic systems can adapt to real-time user states. Integrating biofeedback-driven tactile system and implement with other experience such as virtual reality, may further enhance its calming potential and support broader use cases such as pre-meeting anxiety, learning breaks, or sleep onset.

Long-Term Studies. Our study design provided a supportive evidence of the relaxation response being elicited during rest with MindSpace in a short study, however, did not allow us to measure long-term effects after a continuous use of *MindSpace.* Conducting long-term studies could reveal how regular use of tactile breathing interfaces impacts workspace wellness, emotion self-regulation, and sustainable digital work habits over time. Again, to our knowledge, few studies have explored the integration of slow tactile breathing rhythm with deep pressure for short relaxation breaks in everyday contexts, therefore, the long-term studies would not only potentially explore both positive and negative effect of using *MindSpace* to practice short relaxation breaks during the day but would provide us with some hints on how long-term behavioral change would occur through users being able to practice pausing and taking short relaxation breaks which may help build resilience or build on distractions in their mind. As daily routines become more hybrid and self-managed, tools like *MindSpace* can play an increasingly important role in scaffolding embodied rest and reflective moments but also unveiling the effect of introducing short relaxation breaks in the users' daily routine.

Break and Environment. While we have observed the effects of *MindSpace* during short breaks in a simulated workday context in a laboratory environment, research on the use during longer breaks or even during sleep and its effects is still needed. Varying the breaks' length and purpose in combination with real-world settings, such as offices, schools, or homes, would provide a better understanding of how *MindSpace* can be utilized in everyday life.

8 Conclusion

This paper introduced *MindSpace*, a pneumatically-controlled device that provides a slow-breathing deep touch pressure experience to enhance users' relaxation during short breaks. We detailed the design process and operation of the pneumatic actuator and air pump system, which provide a squeeze-like deep touch pressure sensation along with a soft, life-like slow breathing movement to guide users toward a calm and focused state. Through a mixed-method study (N = 22), we evaluated the effects of *MindSpace* on relaxation response, work performance and workload during a break. Results provided supportive evidence of the relaxation response elicited through the combination of slow-breathing and deep touch pressure during rest with *MindSpace*, as shown by changes in heart rate variability, electrodermal activity, and self-reported measures. Additionally, participants also reported improved mental clarity, reduced workload, and enhanced responsiveness following breaks with the device. These findings hightlight the value of embodied, tactile interfaces in shaping recovery and awareness during everyday transitions. We envision future applications of this approach in workplace well-being, emotional regulation, and mindfulness technologies—and encourage further investigation into the long-term and personalized tactile relaxation tools in daily life.

Acknowledgments

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A Appendix

A.1 Semi-Structured Interview Guide

(1) Questions about breaks in general
   (a) What would you consider as a good break on your work day?
   (b) What's important in your break? What do you aim to achieve?
(2) Question about using MindSpace
   (a) Did you feel the pressure from the device?
   (b) Did you feel that it was inflating and deflating?
   (c) Was the inflating and pressure uncomfortable for you?
   (d) How did you react to the movement?
   (e) About the sound, you were obviously having this headphone to cancel the noise, but was it like something that was distracting for you?
(3) Questions about the experience

(a) How did your mind and body feel when resting with/without the device?
(b) How did you face the Stroop test before and after the rest with/without the device?
(c) If this product was easy to use, would you want it at your workplace or at home?