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Testing a Brief Mindful Nature Connectedness Intervention in an
Urban Park

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Abstract

This study applies and adapts Muneghina's et al. (2021) Brief Mindful Nature Connectedness Intervention (B-MNCI) to fit the context of an urban park and test its effectiveness in strengthening individuals' sense of connection to nature and enhancing psychological restoration during everyday experiences in an urban park setting. Grounded in Lumber, Richardson, and Sheffield's pathways framework (2017), the adapted intervention utilized a 10-minute audio-guided mindfulness practice, specifically tailored to foster sensory awareness, emotional engagement, and appreciation of nature's beauty and meaning – specifically aligned with the 'Good Things in Urban Nature' thematic framework by McEwan et al. (2020). An experimental field study randomly assigned 47 participants to B-MNCI, mind-wandering and unguided control conditions. While the B-MNCI significantly increased state mindfulness, group differences in nature connectedness and psychological restoration were not found. Nevertheless, participants in the B-MNCI and mind-wandering conditions reported lower negative affect post-intervention than the unguided control group, indicating beneficial emotional effects of structured engagement instructions. The findings highlight the promise of brief mindfulness-based interventions in urban environments, suggesting that mindful engagement can have benefits for emotional outcomes, while providing a means to meaningful interactions with urban nature.

Keywords: nature connectedness, mindfulness, psychological restoration, urban parks, mindful engagement

1. Introduction

Major environmental institutions around the world are starting to recognize that a sustainable and just future requires a fundamental transformation in how societies view and interact with the natural world. The recent Transformative Change Report from the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) identifies human disconnection from nature as a primary driver of biodiversity loss and highlights closer human–

nature relationships as a critical strategy for transformative change (O'Brien et al., 2025). This call for strengthening the human–nature relationship aligns with a broader, global emphasis on addressing both ecological degradation and human ill-being, with organizations such as the United Nations (United Nations Environment Programme, 2021) and World Economic Forum (World Economic Forum, 2022) advocating for an urgent shift in our relationship with nature.

While policy efforts often focus on high-level interventions, parallel strategies at individual and community levels are also essential for creating environments where both people and ecosystems can thrive. A key concept in this regard is nature connectedness, a psychological construct measuring how people think about, feel about, and relate to the natural world (Mayer & Frantz, 2004; Schultz, 2002). A growing body of evidence highlights nature connectedness as a valuable and measurable target for revitalizing the human–nature relationship and emphasizes its potential key role in transformational sustainability interventions (Abson et al., 2017; Ives et al., 2018). Indeed, nature connectedness has been linked not only to enhanced psychological well-being - exceeding the influence of conventional predictors such as socioeconomic status (Capaldi et al., 2014; Martin et al., 2020; Pritchard et al., 2020) - but also to increased pro-environmental and nature conservation behaviors (Mackay & Schmitt, 2019; Richardson et al., 2020). Notably, existing research highlights that nature connectedness is a more robust predictor of well-being and pro-environmental behaviors than indicators like the duration or frequency of visits to natural environments alone (Martin et al., 2020; Richardson et al., 2021). Thus, research on nature connectedness provides an evidence base regarding its beneficial impact on both human and ecological well-being, positioning it as a fundamental psychological need (Hurly & Walker, 2019) capable of integrating and harmonizing the interests of people and nature alike.

In addition to these cross-sectional findings, researchers have begun to develop and test targeted interventions that foster nature connectedness more directly. Many of these interventions focus on active engagement with nature as a pathway to improved mental health and well-being, delivering sustained benefits through both direct (e.g., physically interacting with nature in outdoor settings) (McEwan et al., 2019) and indirect (e.g., engaging with nature imagery, sounds, or guided visualization exercises without physical presence in natural environments) (Muneghina et al., 2021) engagement approaches. Some interventions are deliberately designed to activate the ‘pathways to nature connectedness’ (Lumber et al., 2017), a broad framework for the design of

creative engagement and alternative values and frames to the traditional routes of knowledge and identification often used when engaging people with nature. Lumber et al. (2017) first brought these pathways to life through a "walking intervention," in which participants engaged in activities such as discussing their feelings about the surrounding nature and writing about its personal significance. This approach resulted in significantly greater increases in nature connectedness compared to simply spending time walking in nature without structured reflection. More recently, White et al. (2023) demonstrated that a targeted intervention designed to activate the sensory contact and emotion pathways - by prompting participants to observe birds specifically for feelings of joy - effectively enhanced participants' sense of connection with nature and significantly reduced anxiety, relative to a control group that merely counted birds. Collectively, a growing body of research underscores that active engagement, particularly deliberate sensory noticing of nature rather than passive exposure, is critical in cultivating and maintaining a deeper connection with nature (Richardson et al., 2022). Moreover, noticing has the potential to serve as a gateway to emotional engagement, appreciation of beauty, and the development of meaning and compassion in the human-nature relationship (Richardson et al., 2022).

The role of engagement with nature in fostering nature connectedness is especially worth considering in everyday nature experiences, such as in urban areas (i.e., urban green parks) or near one's home. Considering that more than 50% of the world's population finds its source of nature interaction in an urban environment (Newman & Dale, 2013), finding ways to strengthen connection to nature in these environments could be an effective strategy of supporting wellbeing among populations living in cities and a major leverage point for fostering environmental stewardship. As indicated by studies involving urban nature or indirect nature experiences (Muneghina et al., 2021; Nisbet et al., 2019), wildlife-rich nature reserves, rural and coastal areas or forests are not a pre-requisite for growing nature connection. While they may certainly offer greater opportunities for connection and greater biodiversity increases people's feelings of closeness with nature (Wyles et al., 2019; Hamlin et al., 2022), nature engagement can happen almost anywhere. What seems to be more important are opportunities, prompts and invitations for people to engage with the natural environment (Sheffield et al., 2022).

Mindful engagement and psychological outcomes of nature experiences

Mindfulness practice in nature has a long history (Fabjansky & Brymer, 2017) and has been receiving contemporary attention as evidenced by a rise in nature-based meditation applications (see Djernis et al., 2019; Kotera et al., 2020). There is evidence that some forms of mindfulness can support restoration in nature experiences (Lymeus et al., 2018; Shin et al., 2013; Nisbet et al., 2019) and promote connection with nature (Aspy & Proeve, 2017; Barrable et al., 2021; Choe et al., 2020; Nisbet et al., 2019; Wang et al., 2016). These studies define and operationalize mindfulness in different ways: for example, open monitoring mindfulness practice in nature (Lymeus et al., 2018), mindful walking interventions that direct attention to physical and sensory phenomena (Nisbet et al., 2019; Shin et al., 2013) or focused attention on the present moment while focusing on nature sounds and noticing sights of nature (Barrable et al., 2021). Building on this work and mindfulness theory, Macaulay et al. (2022) created a conceptual model which identifies the mechanisms through which mindful engagement facilitates connection with nature and psychological restoration, with a particular focus on urban contexts where access to high-quality natural environments is often limited. They argue that mindful engagement supports these outcomes through three key mechanisms - perceptual sensitivity, decentering, and non-reactivity - which enhance individuals' ability to derive psychological benefits from everyday nature experiences. In short, perceptual sensitivity is thought to enhance an individual's ability to notice and engage with subtle natural elements in their surroundings, even in fragmented or low-quality urban environments where greenery may be sparse or less immersive. At the same time, decentering and non-reactivity help individuals regulate their cognitive and emotional responses to their environment. Decentering facilitates psychological distance from stressors, enabling a deeper sense of "being away" even in constrained urban settings, while non-reactivity reduces automatic negative judgments about the quality of available nature. Together, these mechanisms create a reinforcing cycle - perceptual sensitivity deepens engagement, non-reactivity fosters acceptance, and decentering promotes immersion - allowing individuals to experience psychological restoration and nature connectedness even in everyday, urban nature encounters.

Current study

The current study applies and adapts a Brief Mindful Nature Connectedness Intervention (B-MNCI), originally developed by Muneghina et al. (2021), to an urban park context. The B-MNCI is a brief, 10-minute audio-guided intervention structured around mindfulness and designed to foster nature connectedness by activating Lumber, Richardson, and Sheffield's (2017) pathways of sensory contact, emotion, meaning, beauty, and compassion. In the original study, this brief intervention—applied as a daily 10-minute guided meditation over five consecutive days—demonstrated efficacy in significantly increasing participants' nature connectedness, with effects sustained at a two-week follow-up. While the original intervention integrated guided imagery with background nature soundscapes, the present adaptation explicitly focuses participants' attention on the sensory elements already present in an urban park, omitting the artificial addition of nature sounds. Further, the audio guidance has been adapted to align closely with McEwan et al.'s (2020) thematic framework of "good things in urban nature," encouraging participants to notice, appreciate, and engage emotionally with urban wildlife encounters, street trees, and expansive skies - features frequently reported as meaningful by urban residents. This adapted brief intervention is delivered via an accessible prompt that invites casual park visitors to engage mindfully with their immediate environment, leveraging everyday urban nature encounters to facilitate increased nature connectedness and psychological restoration, including an improved mood. To evaluate its effectiveness rigorously, the current study includes a mind-wandering control condition. This choice is informed by recent work suggesting that mind wandering represents a realistic baseline state of spontaneous cognitive engagement frequently occurring in everyday nature experiences, thus offering an ecologically valid and theoretically relevant comparison to structured mindful engagement (Macaulay et al., 2024). Specifically, mind wandering, characterized by task-unrelated thoughts, is prevalent in natural environments, potentially eliciting restorative outcomes, but is conceptually distinct from mindfulness due to its unintentional, less regulated nature (Macaulay et al., 2024). This distinction enables the present research to isolate the specific benefits attributable to mindful engagement. Furthermore, an unguided control group, without specific instructions for engagement, was also included to isolate the effect of structured guidance from the mere presence or time spent in nature, thus allowing for

clearer interpretation of the specific contribution of mindful engagement instructions above and beyond spontaneous, unguided nature experiences.

Building on the efficacy demonstrated by Muneghina et al. (2021) and the potential of mindful engagement highlighted by Macaulay et al. (2022), the current study seeks to examine the effectiveness of this adapted B-MNCI within everyday urban park experiences. Specifically, the study tests two primary hypotheses. First, it is expected that participants who engage with urban nature through the adapted B-MNCI intervention will report significantly higher levels of nature connectedness compared to both control conditions (H1a). Given prior evidence, it is also anticipated that mindful engagement with urban nature will lead to higher levels of psychological restoration (H1b), including improved mood outcomes (H1c). Additionally, it is hypothesized that state mindfulness induced by the intervention will mediate the effects of condition on nature connectedness and restoration. Specifically, it is proposed that increases in nature connectedness and psychological restoration will be mediated by state mindfulness (H2).

2. Method

2.1. Recruitment and sample

The study was conducted from mid-October to mid-November 2024. During the first two weeks, participants were recruited through 70 stickers placed at various seating areas throughout the park, serving as prompts (see Fig. 1). The stickers encouraged park visitors to join a study by scanning a QR code, leading them to a survey on how people experience urban park environments. The message subtly indicated that participants would engage in a brief, relaxing exercise that could be completed while seated in the park (see Fig. 2 for full detail of the messaging). During this period, 20 individuals scanned the sticker, but only 3 completed the study. In the final two weeks,



Figure 1. Stickers on park benches and so called “Enzis” (on the right) distributed across the campus area

recruitment efforts were expanded by actively approaching individuals in the park and by distributing flyers designed to increase awareness of the study and the stickers. During this period, the sticker was scanned 72 times, with 44 individuals completing the study. Ultimately, the final sample consisted of 47 participants. Dropout rates were comparable across the experimental

conditions (B-MNCI, Mind-Wandering, and control group), and no significant differences were found in dropout rates between the groups. The majority of participants were female (74%) and the mean age was 26.4 years ($SD = 8.4$). Inclusion criteria were age (16 years or older) and access to a smartphone which participants could use to scan the QR-code on the sticker and listen to the instructions.

The sample size was determined a priori with a power analysis using G*Power software (Faul, Erdfelder, Lang & Buchner, 2007). Based on a power of .80, an alpha level of 0.05, and an effect size of $f^2=0.0625$, the target sample size was set at 158 participants.



Figure 2. Header – Briefly relax, support research; Description – 15 minutes time? Scan the QR-Code and help the environmental psychology research group understand, how people in parks experience their environment. You will be randomly assigned to a short exercise – easy, relaxed and doable directly in the park.

2.2. Procedure

Participants were asked to participate in a 10-minute-long activity, which could be completed directly in the park while sitting on a park bench. Before and after this activity, they completed online surveys. The pre-test survey included measures of trait nature connection, trait mindfulness, positive and negative affect and the perceived restorativeness of the given environment. The post-test survey consisted of measures of positive and negative affect, state connection with nature, state mindfulness, perceived restorativeness of the experience and demographic questions. Participants were randomly allocated to one of three groups: a group instructed by an audio recording to engage mindfully during their outdoor experience and direct their attention to various natural elements of the park ('BMNCI group'; $n = 13$); a group instructed by an audio recording to let their minds wander ('mind wandering group'; $n = 17$); and an unguided control group who received no engagement instructions ('unguided control'; $n = 17$). Participants in the BMNCI and mind wandering groups were additionally asked how well they were able to follow the instructions. Full instructions in audio format and their transcripts are provided in the Appendix.

2.3. Location

The study was conducted within the Campus of the University of Vienna - also known as the "Altes AKH". This centrally located urban park spans approximately 9.6 hectares and serves as a highly accessible green space frequented by students, university staff, and local residents. Given its substantial size, diverse vegetation, historical architecture, and popularity as a recreational area embedded within Vienna's densely populated urban environment, the Campus provides a relevant and ecologically valid setting to explore everyday interactions with urban nature. The campus' combination of numerous park benches, green courtyards, water fountains, trees and wildlife, creates opportunities for brief, meaningful engagements with nature, making it an ideal context for testing the efficacy and feasibility of mindful nature-connectedness interventions in urban everyday life.

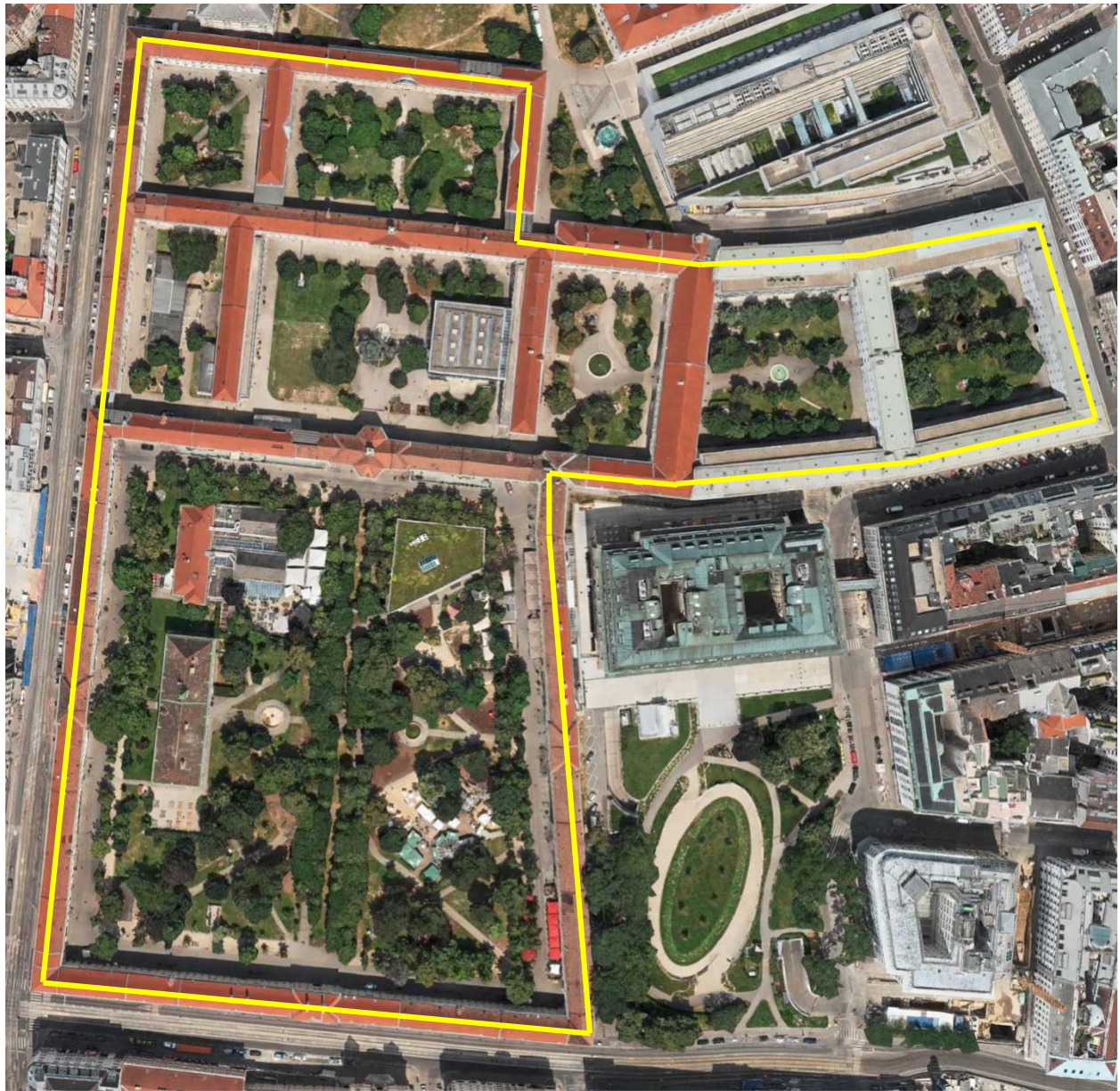


Figure 3. Aerial image of the University Campus (highlighted by the yellow border). Adapted from Apple Maps Satellite view (Apple Inc., 2025).

2.4. Measures

2.4.1. Trait and state mindfulness

Trait mindfulness was assessed using the short version of the Mindful Attention Awareness Scale (MAAS-Short; Höfling et al., 2011). The MAAS-Short consists of ten items, including five negatively worded items derived from the original MAAS and five positively worded "mirror

items." Participants responded to statements such as, "*I find it difficult to stay focused on what's happening in the present,*" using a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*). The German version of the scale was adapted using the validated translation of the original MAAS (Michalak et al., 2019). The scale demonstrated good internal consistency ($\alpha = .82$).

State mindfulness was measured with the Mindful Attention Awareness Scale, translated into German (MAAS; Brown & Ryan, 2003; $\alpha = .69$). The scale consists of five items, designed to assess the current expression of a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place. Participants responded to statements such as, "*I was doing something without paying attention.*" using a 6-point Likert scale ranging from 1 (*not at all*) to 6 (*very much*). The instructions for the MAAS were adapted to prompt participants to respond based on their experiences during the engagement activity.

2.4.2. *Trait and state connection with nature*

Trait connection with nature was measured using the Nature Connection Index (NCI, Richardson et al., 2019, $\alpha = .91$). The NCI includes 6 items with 7-point responses ranging from 1 ('completely agree') to 7 ('completely disagree'). Each response option, to each item on the scale, is assigned a weight and total scores on the scale range from 0 to 100. The measure was translated into German for lack of a translated version.

State connection with nature was measured using the German version of the Inclusion of Nature in Self Scale (INS, Schultz, 2002). The instructions of the INS were adapted to instruct participants to respond based on their feeling in the 'present moment'.

2.4.3. *Positive and negative affect*

Positive affect (PA) and negative affect (NA) were measured using the International Positive and Negative Affect Schedule Short-Form (I-PANAS-SF; Thompson, 2007), with items translated into German from the PANAS (Breyer & Bluemke, 2016). Responses were summed as separate scales

before (PA pre $\alpha = .71$; NA pre $\alpha = .89$) and after the intervention (PA post $\alpha = .77$; NA post $\alpha = .90$)

2.4.4. Perceived Restorativeness

Perceived restorativeness was measured with four items from the Perceived Restorativeness Scale (PRS; Hartig, Korpela, Evans & Gärling, 1997; $\alpha = .82$). Following previous studies that test restorativeness in small urban parks, four items were used that measure fascination with the environment/ experience and a sense of being away from everyday demands (Lindal & Hartig, 2015; Nordh, Hartig, Hegerhall, & Fry, 2009).

2.4.5. Psychological Restoration

Feelings of restoration after the brief nature experience were measured by the Restoration Outcome Scale (ROS, Korpela et al., 2008; $\alpha = .86$). The ROS included 6 items, rated on a 7-point scale ranging from 1 (not at all) to 7 (completely). The items refer to feelings of relaxation and calmness (“I feel calmer”, “I feel restored and relaxed”, “I have a new enthusiasm and energy”), attention restoration (“My concentration and alertness clearly increased”) and clarified thinking and minimizing everyday worries (“I forgot everyday worries here”, “Visiting here cleared and clarified my thoughts”).

All full scales, including item wording and response formats, are presented in the Appendix.

2.5. Analysis

All analyses were conducted using R Studio (version 2024.12.0+467). Prior to analysis, data were checked for missingness and met the assumption of being missing completely at random (Little’s MCAR test; Little, 1988). Assumptions for ANCOVA, multiple regression, and mediation analyses - including normality of residuals, homogeneity of variances, parallel regression slopes, and absence of multicollinearity - were tested and satisfactorily met. Residual plots and Levene’s tests supported the assumptions of normality and homogeneity of variance, respectively, and no evidence of problematic multicollinearity was detected.

To test H1, a series of ANCOVAs were conducted to evaluate intervention group differences in state nature connectedness, psychological restoration, and mood. Trait mindfulness, trait connection with nature, perceived restorativeness, and positive and negative affect before the nature experience were included as covariates to control for potential variation in engagement due to individual or situational factors.

Complementing the ANCOVAs, a series of standardized multiple regression analyses were performed to further examine the combined predictive effects of baseline measures and intervention group membership on each psychological outcome. In these analyses, each outcome variable (state nature connectedness, psychological restoration, positive affect, and negative affect) was regressed on the same set of predictors: pre-test trait mindfulness, trait connection with nature, perceived restorativeness, positive and negative affect before the experience, and dummy-coded variables representing the BMNCI and Mind-Wandering groups, with the unguided control group serving as the reference category. These regression analyses were designed as complementary tests of H1.

In preparation for testing H2, a standardized multiple regression analysis was conducted to examine whether intervention condition predicted state mindfulness. The same set of predictors used in the previous regression models was included: pre-test trait mindfulness, trait connection with nature, perceived restorativeness, positive and negative affect before the experience, and dummy-coded variables representing the BMNCI and Mind-Wandering groups, with the unguided control group as the reference category. This analysis served to establish whether group assignment influenced state mindfulness, which is a necessary precondition for the proposed mediation model.

To test H2 - whether the effects of intervention group on the outcome variables are mediated by variations in state mindfulness, a mediation analysis was performed using structural equation modeling (SEM) within a subset of participants. The subset included only participants from the BMNCI intervention group and the mind-wandering group, as these groups were designed to have opposing effects on state mindfulness. The mediation analysis was conducted using the lavaan package in R, allowing for simultaneous estimation of direct, indirect, and total effects. The models were specified such that Group (coded as 1 = BMNCI, 2 = Mind-Wandering)

predicted state mindfulness, which in turn predicted each outcome variable (state connection with nature, psychological restoration). Bootstrapped confidence intervals (500 resamples) were computed to assess the robustness of mediation effects. Standardized regression coefficients were reported to facilitate interpretation of effect sizes. Model fit was evaluated using CFI, TLI, RMSEA, and SRMR, and results are reported with standardized estimates and 95% confidence intervals.

3. Results

3.1. Intervention group Differences

Overall, the estimated pattern of mean scores appeared to align partially with H1: descriptively, the B-MNCI group had the highest mean value in state nature connectedness. However, none of the observed group differences for state nature connectedness, psychological restoration, or positive affect reached statistical significance. The only statistically reliable group effect was found for negative affect: participants in the unguided control group reported significantly higher post-experience negative affect compared to both the B-MNCI and mind-wandering groups ($p < .01$; see Table 1).

Table 1 *ANCOVAs testing the difference between intervention groups on outcome variables*

^{a, b} Means in the same row containing different superscripts differ significantly. EMM = estimated marginal means. SE = standard error

<i>Dependent variable</i>	B-MNCI group	Mind-wandering group	Unguided group	Omnibus test
<i>Covariates:</i>	EMM (SE)	EMM (SE)	EMM (SE)	
Nature Connection	4.62 (0.30)	4.41 (0.25)	3.94 (0.26)	$F(1, 39) = 1.36, p = .23, \text{partial } \eta^2 = 0.07$
Restoration	3.59 (0.35)	3.61 (0.30)	2.84 (0.31)	$F(1, 39) = 1.90, p = .16, \text{partial } \eta^2 = 0.09$
Positive affect (post)	3.03 (0.18)	3.05 (0.16)	2.68 (0.16)	$F(1, 39) = 1.63, p = .21, \text{partial } \eta^2 = 0.08$
Negative affect (post)	1.19 (0.05) ^a	1.14 (0.05) ^a	1.40 (0.05) ^b	$F(1, 39) = 8.18, p < .01, \text{partial } \eta^2 = 0.30$

3.2. Individual and situational factors

To complement the ANCOVA findings and assess the combined predictive value of group assignment and individual difference variables, a series of multiple regression analyses were conducted for each psychological outcome variable (Figure 4). Each model included the same set of predictors: trait mindfulness, trait nature connection, perceived restorativeness, baseline positive and negative affect, and dummy-coded intervention groups (with the unguided group as the reference category). Perceived restorativeness emerged as a significant positive predictor of state nature connectedness. Consistent with the ANCOVA results, no significant group differences were found for state nature connectedness, psychological restoration, or positive affect. The only significant finding at the group level was that participants in the mind-wandering group reported significantly lower negative affect compared to those in the unguided control group ($p < .05$), replicating the ANCOVA result.

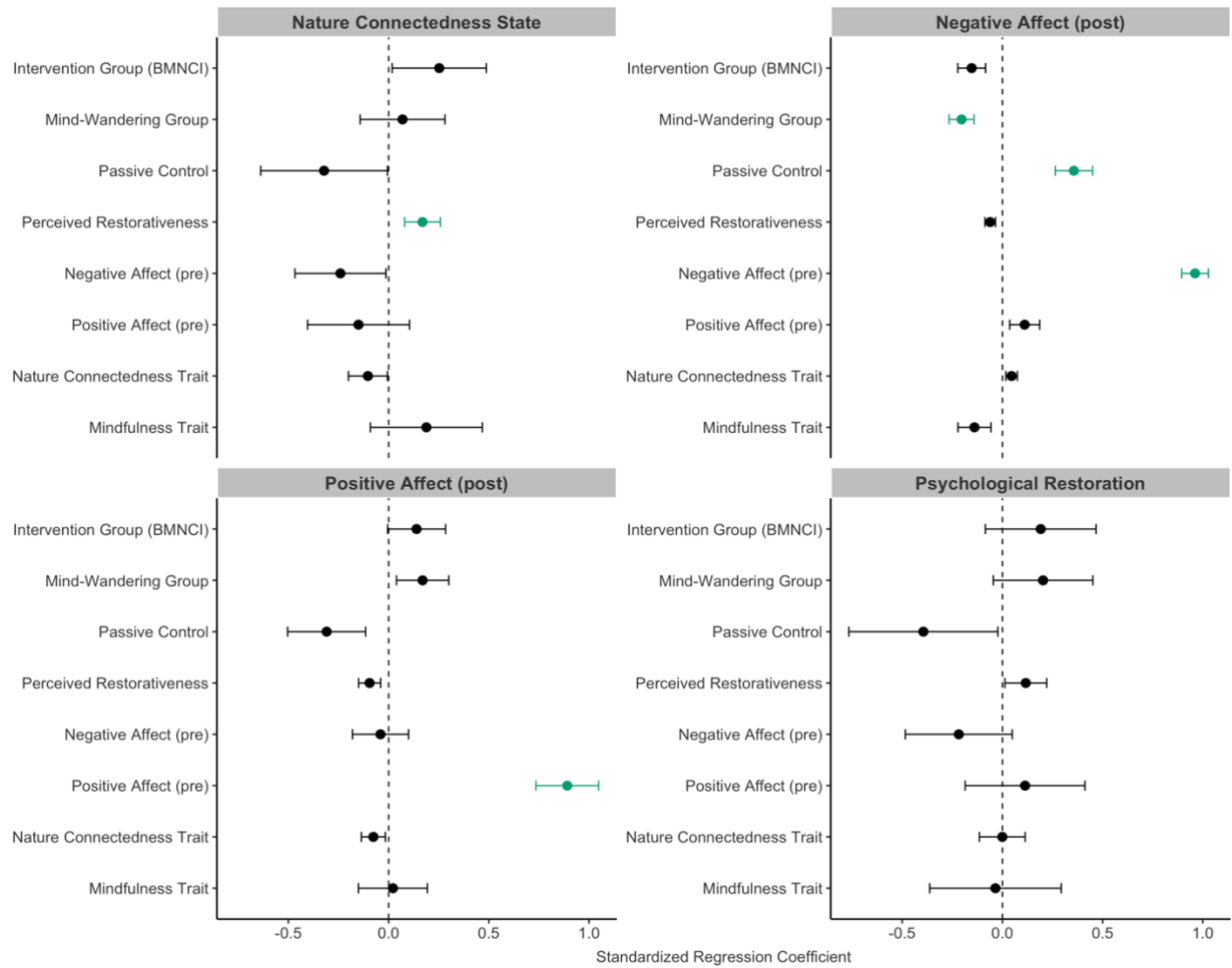


Figure 4. Regression model where intervention groups and baseline (pre-test) variables predict separate psychological outcomes. The engagement groups are compared against the unguided control as the reference group. Circles are standardized regression coefficients and are shown with 95% confidence intervals. Statistically significant predictor variables are colored green, with those above zero indicating positive associations with the outcome variables, and those below zero indicating negative associations with the outcome variables. The models' constants are omitted in these graphs so that the figures can be interpreted more clearly.

Mindfulness State

In preparation for testing H2, a multiple regression analysis was conducted to assess whether intervention group assignment predicted post-experience state mindfulness scores, controlling for the same covariates described above. Results revealed that participants in the B-MNCI group reported significantly higher state mindfulness scores than those in the unguided control group ($p < .01$), while participants in the mind-wandering group reported significantly lower scores ($p < .01$). Additionally, trait mindfulness significantly predicted state mindfulness ($p < .001$), indicating that both dispositional and experimental factors influenced participants' momentary mindful awareness (Figure 5). These findings confirmed that the two engagement-based interventions produced the intended directional effects on state mindfulness and thus justified the subsequent mediation analysis.

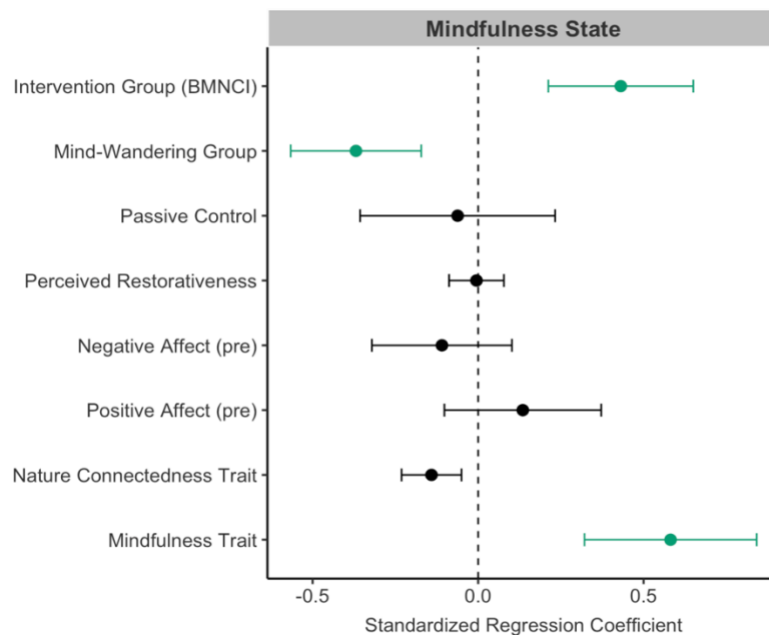


Figure 5. Regression model where intervention groups and baseline (pre-test) variables predict state mindfulness. The engagement groups are compared against the unguided control as the reference group. Circles are standardized regression coefficients and are shown with 95% confidence intervals. Statistically significant predictor variables are colored green, with those above zero indicating positive associations with the outcome variables, and those below zero indicating negative associations with the outcome variables. The models' constants are omitted in these graphs so that the figures can be interpreted more clearly.

3.3. Mediation Analysis

Two mediation analyses were conducted using structural equation modeling in lavaan (Version 0.6.15) with nonparametric bootstrapping to test whether state mindfulness mediated the effect of group (contrasting the B-MNCI and Mind-Wandering groups) on the outcome variables of state nature connectedness and psychological restoration. In both models, group was coded as a dummy variable (BMCI = 1, Mind Wandering = 0).

For state nature connectedness (INS):

The model specified that group membership predicted state mindfulness (path a), which in turn predicted INS (path b), while also including a direct effect of group on INS (path c'). The results indicated that group membership significantly predicted state mindfulness ($a = -1.041$, $SE = 0.369$, $z = -2.82$, $p = .005$). However, the effect of state mindfulness on INS was not significant ($b = 0.143$, $SE = 0.163$, $z = 0.88$, $p = .379$). Consequently, the indirect effect was non-significant ($a \times b = -0.021$, $SE = 0.047$, $z = -0.46$, $p = .649$), and the direct effect of group on INS remained non-significant ($c' = -0.150$, $SE = 0.370$, $z = -0.41$, $p = .686$), despite a significant total effect (total effect = -1.062 , $SE = 0.372$, $z = -2.85$, $p = .004$).

For psychological restoration:

A similar mediation model was tested with psychological restoration as the outcome. Again, group membership significantly predicted state mindfulness ($a = -1.041$, $SE = 0.369$, $z = -2.82$, $p = .005$), but the effect of state mindfulness on psychological restoration was not significant ($b = 0.110$, $SE = 0.150$, $z = 0.73$, $p = .465$). This resulted in a non-significant indirect effect ($a \times b = -0.114$, $SE = 0.043$, $z = -1.86$, $p = .063$) and a non-significant direct effect of group on psychological restoration ($c' = -0.200$, $SE = 0.350$, $z = -0.57$, $p = .567$). The overall total effect of group on psychological restoration was likewise non-significant (total effect = -1.314 , $SE = 0.400$, $z = -3.28$, $p = .089$).

Together, these findings indicate that although group was associated with changes in state mindfulness, state mindfulness did not serve as a significant mediator of the relationship between group and either outcome variable. The intervention's effect on state nature connectedness appears

to be driven primarily by factors other than the measured mediator, and no mediation was observed for psychological restoration.

3.4. Open-ended comments

At the end of the post-test survey, participants were invited to provide open-ended reflections on their subjective experiences of the intervention. In total, 22 participants offered comments, providing valuable qualitative insights that enrich and contextualize the quantitative results reported earlier. Table 2 presents participant comments from both the B-MNCI and Mind-Wandering groups. Overall, participants positively received the B-MNCI, describing it as "a lovely meditation" and noting personal benefits (see comments [1], [2]). One participant specifically emphasized that it provided temporary relief from daily concerns (comment [1]). However, many participants had trouble fully engaging with the guided meditation due to urban disturbances, notably construction noise, traffic sounds, and human activity (comments [1], [2], [3], [5]). One participant also mentioned challenges arising when environmental conditions did not align with the audio guidance (comment [5]). Despite these distractions, two individuals reported meaningful interactions with nature that enhanced their overall experience (comments [1], [5]).

Participants in the Mind-Wandering group similarly responded positively, highlighting the relaxing nature of the audio instructions (comment [11]) and their usefulness for stress reduction and daily well-being (comment [8]). However, like the B-MNCI group, participants experienced challenges maintaining concentration due to urban distractions (comment [7], [9]).

In summary, while urban environmental disturbances significantly interfered with participants' ability to fully follow the audio instructions in both groups, some individuals engaging in the B-MNCI still reported positive subjective experiences and meaningful interactions with nature, underscoring the potential benefits of a brief mindfulness-based intervention even in challenging urban contexts.

BMNCI-group

[1] 'I really needed the meditation today. It helped me briefly switch off and not feel like I had to think about several things at once. However, due to construction sites nearby, I couldn't focus as much on the sounds of nature during this exercise. Nevertheless, seeing and feeling everything around me was all the more beautiful.'

[2] 'A lovely meditation. Unfortunately, there was a construction site nearby that was quite loud, making it difficult for me to focus on other sounds.'

[3] 'I enjoyed paying attention to nature, but since they're setting up the Christmas market here, there were many loud, distracting noises, and I realized just how much noise I usually tune out.'

[4] 'I found the meditation very pleasant.'

[5] 'At first, I found it difficult to follow the instructions in the audio because the voices of people and the traffic noises were louder than the sounds of nature. There was hardly any wind at that moment, and even the sun was barely visible, so I was mostly distracted by the human and traffic sounds. But what turned things around was that, towards the end, two pigeons flew over to me and started looking for crumbs (I had eaten something earlier). That brought out a bit of my inner child or childlike joy, because since I was sitting so still, they dared to come really close and have now been observing me for quite a while.'

[6] 'Very cool. Thank you very much!'

Mind wandering group

[7] 'I found it hard to concentrate because of the other people in the park, noises from the street, etc.'

[8] 'It took longer than 15 minutes. Unfortunately, I have an appointment now and am stressed. Would have preferred to do it after the appointment if I had known.... The relaxation would be good. But now I know that meditation would also be good for me during the day, not just for sleeping. Thank you, all the best.'

[9] 'I found it difficult to let go because so many people passed me by.'

[10] 'Personally, I like audio like this to help you calm down and be more aware of what's around you. Personally, I would have preferred it with a background noise that wasn't too noticeable, but as I was already out in nature anyway, it wasn't so bad.'

[11] 'Very nice and relaxing guide through the meditation.'

[12] 'Very cool, thank you.'

[13] 'Was already somewhat distracted by the animals present'

4. Discussion

4.1. Summary of results

The current study applied and adapted a Brief Mindful Nature Connectedness Intervention (B-MNCI), originally developed by Muneghina et al. (2021), specifically to the context of everyday urban park experiences. Grounded in Lumber, Richardson, and Sheffield's (2017) pathways framework, the B-MNCI aimed to promote nature connectedness through structured mindfulness practice focused on sensory contact, beauty, emotion, meaning, and compassion. Although prior studies using similar brief interventions have demonstrated efficacy in significantly enhancing nature connectedness and psychological restoration, the current study found mixed evidence for these outcomes. While participants in the B-MNCI group exhibited significantly higher levels of state mindfulness compared to both the mind-wandering and unguided groups, no statistically significant group differences were found for post-intervention nature connectedness when accounting for individual and situational covariates. Although not robust, the descriptive pattern of mean scores was broadly consistent with the hypothesized direction: participants in the B-MNCI group reported the numerically highest values for nature connectedness, followed by the mind-wandering group, with the unguided control group showing the lowest. However, these differences did not reach statistical significance and should therefore be interpreted with caution. Regarding the outcomes of psychological restoration, both the mindful engagement and mind-wandering groups reported significantly lower negative affect compared to the unguided control, suggesting beneficial psychological effects attributable to structured engagement instructions. Additionally, an exploratory linear regression analysis examining state mindfulness as a predictor of post-intervention negative affect revealed a negative association within the unguided control group. This suggests that participants who engaged more mindfully during the unguided period experienced lower levels of negative affect afterward. Intervention groups did not differ significantly in terms of participants' subjective reports of psychological restoration and positive affect.

4.2. Limitations

As the primary goal of the study was to examine an intervention aimed at strengthening connection with nature, it is important to first acknowledge limitations that may have hindered the intervention's effectiveness in achieving this outcome. One key issue was a substantial delay - approximately 2.5 months - between the planned and actual start of data collection due to delays in feedback and permissions from research partners regarding the intended study sites. As a result, the pre-recorded B-MNCI audio contained a prominent environmental cue: the sound of water fountains, which are only active during the summer months. This mismatch between the audio and the actual setting may have reduced the ecological congruence and, consequently, the intervention's impact. Moreover, as indicated by responses in the open-comment section, additional incongruences between the audio and the actual environment may have emerged due to varying environmental conditions, such as differences in ambient sounds (e.g., wind or birdsong). This may have led participants to disengage from the audio instructions, with their attention instead being drawn to more dominant urban sounds, such as human activity and traffic noise. Notably, just before the data collection period, underground maintenance work started across large parts of the campus, resulting in persistent drilling noise and the closure of some park areas. Moreover, the construction of a Christmas market began during the data collection period, further reducing the availability of largely undisturbed park areas. Relatedly, participation in the study required the use of a mobile phone, which may have further undermined the intended experience. Prior research has shown that mobile phone use can reduce individuals' sense of connectedness to nature (Richardson et al., 2018), suggesting that the very medium used to deliver the intervention may have reduced its effectiveness.

Moreover, it is important to acknowledge that the study was underpowered due to a lower-than-anticipated sample size, resulting in limited statistical power to detect small to medium effects, particularly for between-group comparisons and mediation analyses. As a result, some potentially meaningful trends, such as the observed gradient in nature connectedness across groups, may not have reached statistical significance, not necessarily due to a lack of effect but due to limited sensitivity in the analysis.

Lastly, another limitation pertains to recruitment methods. The intention to deliver the intervention through an accessible prompt designed to invite casual park visitors to engage mindfully with their immediate environment and thereby enhance the study's ecological validity by simulating a real-life scenario, was largely unfulfilled. The prompt, implemented as a sticker, was intentionally kept general, avoiding explicit reference to the specific form of engagement. Rather than directly encouraging mindful interaction with the environment, it invited people to participate in a study, which may have reduced its effectiveness in evoking spontaneous engagement or curiosity, indicated by a low scan- and response rate in the first two weeks of recruitment.

4.3. Integration and future directions

The outlined findings suggest that implementing a Brief Mindful Nature Connectedness Intervention (B-MNCI) in an urban park setting may have beneficial effects on mood-related aspects of psychological restoration, while also fostering experiences that have the potential to strengthen individuals' connection with nature and which, by repeated engagement, potentially could lead to sustained improvements in trait nature connectedness (Sheffield et al., 2022). Although individuals' connection with nature was not significantly higher after the B-MNCI compared to the controls, the direction of the effect is consistent with theoretical expectations, suggesting that with a more robust and balanced sample size and more optimal timing of data collection, a repeated study may be better positioned to detect statistically significant effects. However, it is important to acknowledge that within the specific context of prompting individuals in an urban park to engage mindfully with their surroundings to enhance nature connectedness and psychological restoration, the B-MNCI utilized in this study may not be the optimal approach, due to its closer alignment with focused-attention meditation practices (FAM) (Lutz et al., 2008).

Although the B-MNCI incorporated some elements of Open Monitoring Meditation (OMM) (e.g., cultivating receptive awareness towards sensory and emotional experiences), it predominantly resembled FAM (Lutz et al., 2008). Specifically, the structured emphasis on intentionally selected nature-related themes encouraged sustained attentional effort, which may have subtly increased cognitive demands and constrained restorative effects. In relation to the mechanisms of mindful engagement outlined by Macaulay et al. (2022), the B-MNCI likely

fostered perceptual sensitivity effectively, but its structured guidance may have limited spontaneous sensory discovery and soft fascination. Similarly, the intervention encouraged emotional reflection and partial decentering, yet did not fully support open-ended cognitive distancing from emotions. Lastly, by explicitly promoting emotional engagement rather than neutral observation, the B-MNCI was fundamentally less compatible with non-reactivity.

According to the attention network training paradigm (Posner et al., 2010; Tang & Posner, 2009), FAM involves intentional and repeated redirection of attention to selected targets, exercising the brain's engaged cognitive networks similarly to physical workouts. This method contrasts with the attention state training account, a framework proposed by Tang and Posner (2009, 2014) as a complement to restorative environments theory (Kaplan, 2001). Attention state training aligns more with OMM, which emphasizes effortless observation of ongoing internal and external experiences without directing attention to a specific target (Lutz et al., 2008). This style of engagement cultivates a balanced psychophysiological state that enhances naturally available attentional capacities, resonating more with the spontaneous, low-effort cognitive dynamics emphasized in restorative environments research. Programs like Restoration Skills Training (ReST) (Lymeus et al., 2018, 2020) support this approach by using open-monitoring formats to foster mindfulness, improve restoration skills, and enhance nature connectedness.

Importantly, OMM also supports deeper, experiential processes through which individuals can encounter internal and external phenomena in a decentered and equally salient way, promoting a sense of embodied immersion and dissolving boundaries between self and environment (Berkovich-Ohana & Glicksohn, 2014; Lutz et al., 2008). These processes align with theoretical underpinnings of nature connectedness (Mayer & Frantz, 2004; Schultz, 2002) and attention restoration theory (Kaplan & Kaplan, 1989) and suggest a pathway through which mindful engagement can lead to fundamental shifts in perception and values, towards more sustainable and relational modes of being. This line of thought also aligns with Macaulay et al. (2022), who propose that mindful engagement, grounded in open-monitoring practices, enhances nature connectedness in constrained nature especially through the mechanisms of decentering and non-reactivity. Empirical evidence further supports this perspective, demonstrating that decentering is positively associated with increased nature connectedness (Macaulay et al., 2024).

Furthermore, participants' reported difficulties in following the intervention instructions, particularly within the mind-wandering group (see Appendix; Fig. 6), may have diminished the intended distinction between experimental conditions, thereby reducing the predictive strength of the group effects. Consequently, observed differences in outcomes may have been driven more strongly by individual differences in actual engagement rather than group assignment, as also reported in Macaulay et al. (2024). While this study focused on state mindfulness as the primary outcome, it did not include additional quantitative measures capable of capturing participants' specific forms of engagement with their environment during the intervention period. This was a conscious decision to constrain the survey duration and focus on the core research questions, rather than uncovering underlying mechanisms of engagement.

Thus, future interventions designed to enhance psychological restoration and nature connectedness within constrained nature might thus benefit from being more strongly aligned with open-monitoring meditation practices, particularly focusing on mechanisms of decentering and non-reactivity. Additionally, adopting open-monitoring meditation would mitigate issues stemming from audio-environment incongruence. As this form of mindfulness is oriented towards spontaneous discovery and soft fascination, it naturally accommodates variability and unpredictability in environmental conditions.

On a final note, in accordance with the argumentation of Lymeus et al. (2022), it is important to highlight that mindful engagement should not be seen as a way to compensate for suboptimally designed urban green spaces. Rather, the design of green spaces should be equally central in fostering human-nature relationships and promoting psychological restoration. Thus, urban planning must aim to embed mindfulness principles into the environmental design itself, creating settings that inherently encourage mindful interactions with nature, support well-being, and nurture sustainable values and behaviors (Lymeus, 2022). Prompting people by placing stickers on park benches that invite mindful engagement within an urban park is just one way of integrating mindful engagement into everyday urban experiences. However, more diverse and creative ideas are needed to design places capable of naturally prompting meaningful engagement with nature.

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Appendix

B-MNCI – script

(0:30) Während du mit dieser Meditation beginnst, nimm dir etwas Zeit, um dich zu orientieren und wahrzunehmen, wo du bist. (0:37) Nimm die beruhigenden Geräusche des Parks wahr: das Rascheln der Blätter, das Zwitschern der Vögel, vielleicht das Rauschen eines Brunnens in deiner Nähe. (0:43)

Bemerke die volle Farbenpracht: die grünen Bäume, das Sonnenlicht, das durch die Blätter fällt, die lebendigen Blumen und Pflanzen. (1:04)

Und während du deinen Platz in dieser friedlichen städtischen Oase einnimmst (1:09) und deine Sinne zur Ruhe kommen lässt, richte deine Aufmerksamkeit auf eine bestimmte Richtung; (1:14) auf die Geräusche, die du hörst, oder auf das Gefühl der Erde unter dir, (1:20) um zu entspannen und deine Sinne zu öffnen. (1:41) Kannst du die ganze Vielfalt des Lebens um dich herum wahrnehmen? (1:47) Das Rascheln der Blätter, das Zwitschern der Vögel, die Lebendigkeit der Bäume und Pflanzen? (2:07) Mach dir bewusst, wie diese Landschaft dich berührt, was sie in dir hervorruft. Fokussiere deine Aufmerksamkeit nun für die nächsten Sekunden auf ein bestimmtes Detail; ein Geräusch, ein Geruch oder ein Gefühl und werde eins mit Diesem.

Und während du in diesem Park sitzt und deine Aufmerksamkeit (2:44) auf die Geräusche der städtischen Natur richtest, bemerke, wie und warum all diese Dinge (2:51) deine Aufmerksamkeit auf den gegenwärtigen Moment lenken. Lasse dein Bewusstsein in diese Geräusche (2:58) übergehen. Versuche so entspannt wie möglich deine Sinne wachsam zu halten (3:20). Kannst du dir vorstellen, dass dein Geist sich bis zum entferntesten Geräusch ausdehnt? (3:24) Kannst du bemerken, ob dir etwas mitgeteilt wird? (3:45) Fühle hinein in die Tatsache, dass du Teil dieses lebenden, atmenden Ökosystems bist, spüre, dass dich nichts (3:52) von der Umwelt trennt.

Sei dir bewusst, dass du in (4:00) Beziehung zu allen Arten von Lebensformen stehst, ob das nun die Vögel über dir, (4:06) die Bäume um dich herum oder die Menschen und Insekten sind, mit denen du diesen Raum teilst. (4:22) Bemerke, wie die Schönheit dieses Parks deine Aufmerksamkeit auf sich zieht, (4:26) dir erlaubt, das Wunder dieser Landschaft zu fühlen, ihre

Ruhe, ihre Fülle, ihre Lebendigkeit. (4:49) Und während du hier sitzt und zuhörst, lasse deine anderen Gedanken und Sorgen los.

(4:56) Sei einfach präsent, einfach da, hörend oder sehend. Es gibt nichts sonst zu tun, keinen bestimmten Zustand zu (5:05) erreichen. Lasse die Erfahrung einfach so wie sie ist, nutze die nächsten Momente, (5:13) um dies für dich selbst zu üben.

Früher oder später wirst du vielleicht bemerken, dass deine Aufmerksamkeit abschweift, (5:53) abgelenkt wird von der Erfahrung dieses Ortes im Hier und Jetzt. Wenn das passiert, (6:00) bringe deine Aufmerksamkeit einfach zurück, ohne zu urteilen; kehre hierher zurück, in diesen Moment, zu diesen Geräuschen, und bemerke die (6:09) besonderen Qualitäten dieses Ortes, seine Aufrichtigkeit, seine Sanftheit, seine Lebendigkeit, sei dir der Natur (6:17) um dich herum bewusst. Und während dein Geist ruhiger wird und deine Aufmerksamkeit sich schärft, (6:42) bemerke die Auswirkungen davon, in einem Park präsent zu sein. Bemerke deine Achtsamkeit auf seine Geräusche, (6:51) das sanfte Vorbeiziehen des Windes, das Zwitschern der Vögel, das Rascheln der Blätter, und bemerke die Auswirkungen auf deinen Körper, (6:59) dein Herz, deinen Geist. Was bedeutet Natur für dich? Sei dir der einfachen Freude (7:09) oder des Gefühls der Lebendigkeit bewusst, das mit dem in der Natur Sein einhergehen kann.

Erlaube dir, mehr (7:32) mit diesem gegenwärtigen Moment verbunden zu sein, sei dir bewusst, wie diese natürliche Präsenz innerhalb der städtischen Umgebung unterschiedliche Erfahrungen in dir (7:39) hervorrufen kann, ein Gefühl der Verbundenheit und der Neugierde, das du mitnehmen kannst (8:02). Für die letzten Minuten kannst du einfach bei den Geräuschen bleiben, (8:07) die du hörst, bis der Gong ertönt. Versuche, diese Qualität der Achtsamkeit und Akzeptanz (8:14) in den Rest des Tages mitzunehmen.

Audio File: https://drive.google.com/file/d/1-Hs4OnpvZpIZVAbSdm-hp_2tWdeS3X5n/view?usp=share_link

Mind-wandering – script

(0:30) Während du diese Zeit für dich beginnst, nimm dir einen Moment, um dich bequem hinzusetzen und dich zu entspannen. (0:37) Es gibt keinen Grund, dich heute auf etwas Bestimmtes zu konzentrieren. Lass deine Gedanken einfach ganz natürlich fließen. (0:43) Spüre, wie dein Körper zur Ruhe kommt und dein Geist sich öffnet.

Vielleicht denkst du an Dinge, die in letzter Zeit passiert sind, (1:04) Momente, die dir im Gedächtnis geblieben sind. Vielleicht war es etwas Kleines oder etwas Größeres. (1:09) Beobachte, wie diese Erinnerungen ganz von selbst kommen und gehen, (1:14) ohne dass du sie festhalten oder analysieren musst. (1:20) Es ist, als ob du an einem ruhigen Flussufer sitzt und die Gedanken wie Blätter auf dem Wasser vorbeiziehen. (1:41)

Und während du hier sitzt, erlaube deinem Geist, durch die Vergangenheit zu streifen, (1:47) ohne Druck, ohne bestimmte Erwartungen. (2:07) Vielleicht erinnerst du dich an einen schönen Moment, (2:14) an ein Lächeln oder ein Gefühl von Freude, das du erlebt hast. (2:24) Oder vielleicht kommt dir ein Gespräch in den Sinn, eine Begegnung mit jemandem, der dir wichtig ist. (2:44) Spüre, wie diese Erinnerungen sich in deinem Bewusstsein bewegen, wie Wolken am Himmel. (2:51)

Lass deinen Geist auch in die Zukunft schweifen. (3:20) Stell dir vor, was kommen könnte. Vielleicht hast du Pläne für die nächsten Tage oder Wochen. (3:24) Oder du lässt dich von der Vorstellung inspirieren, was in einem Jahr oder noch weiter in der Zukunft sein könnte. (3:45) Vielleicht siehst du dich an einem Ort, den du schon immer einmal besuchen wolltest, (3:52) oder du erträumst dir ein Abenteuer, das du erleben möchtest.

(4:00) Wie fühlt es sich an, diese Freiheit des Denkens zu erleben? (4:06) Gibt es bestimmte Träume, die sich besonders lebendig anfühlen? (4:22) Vielleicht sind es realistische Pläne, die du dir ausmalst, (4:26) oder vielleicht gleiten deine Gedanken in die Fantasie, wo alles möglich ist. (4:49) Erinnere dich, es gibt keinen Grund, dich auf etwas Bestimmtes zu konzentrieren. (5:05)

Genieße es, deinem Geist die Freiheit zu geben dahin zu wandern, wohin er möchte. (5:13) Lass die Bilder vor deinem inneren Auge lebendig werden, ohne Grenzen oder Einschränkungen. (5:53) Erinnere dich, dass es keinen richtigen oder falschen Weg gibt, diese Zeit zu verbringen. (6:00) Du kannst einfach die Gedanken und Bilder kommen und gehen lassen. (6:09) (6:30) Verliere dich in deinen Gedanken, lasse deinen Geist frei schweifen. (6:51) Beobachte, wie die Szenarien und Träume sich entwickeln, (6:59) während du diese Freiheit des Denkens genießt. (7:09)

In den nächsten Minuten kannst du dir erlauben, einfach bei deinen Gedanken zu bleiben. (7:32)
Erlaube dir, in Tagträume abzutauchen, die vielleicht mehr Fantasie beinhalten. (7:39) Vielleicht erfindest du eine völlig neue Welt, (7:45) oder du stellst dir eine Geschichte vor, die du in einem Buch oder Film gesehen hast, und du wirst Teil dieser Geschichte. (8:02)

Für die letzten Minuten, bis der Gong ertönt, kannst du dich ganz in deine Gedanken vertiefen. (8:07) Genieße diese Zeit des freien Denkens und Träumens, ohne Druck oder Erwartungen. (8:14)
Dein Geist kann ohne Grenzen durch Erinnerungen, Pläne und Fantasien streifen. (8:22)

Erlaube dir, in und aus verschiedenen Szenarien zu driften, (8:37) und lass die Minuten vergehen, während du dich diesen lebhaften Bildern hingibst. (8:50) Es gibt keinen Grund, dich zu beeilen oder zu einem Schluss zu kommen. (8:58) Lass deine Gedanken sich so entwickeln, wie sie wollen, bis der Gong ertönt.

Audio File: https://drive.google.com/file/d/1-M6b5J-bXxRaEQ0OYZ7nIvkHkiUiB3Ye/view?usp=share_link

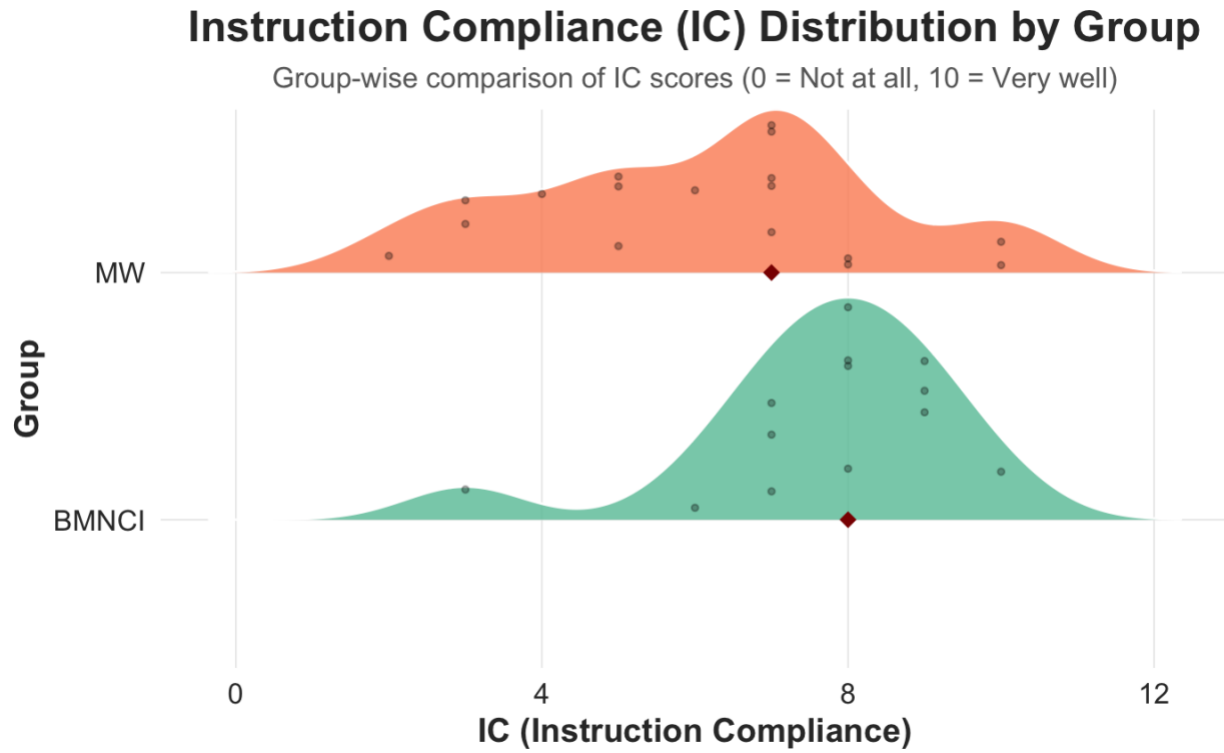


Figure 6. Instruction compliance, showing participants' rating on how well they were able to follow the given instructions in the Mind-wandering and B-MNCI groups (0 = 'Not at all'; 10 = 'Very well')

Full Versions of All Questionnaires and Measures

International Positive and Negative Affect Schedule Short-Form (I-PANAS-SF; Thompson, 2007)

Nun möchten wir gerne von Ihnen wissen, wie Sie sich fühlen. Die folgenden Wörter beschreiben unterschiedliche Gefühle und Empfindungen. Lesen Sie jedes Wort und tragen Sie dann in die Skala neben jedem Wort die Intensität ein. Sie haben die Möglichkeit, zwischen fünf Abstufungen zu wählen. Geben Sie bitte an, wie Sie sich im Moment fühlen.

Falls Sie eine Option mit "1" beantworten möchten, müssen Sie den Regler anklicken.

Skala: 1 = Gar nicht, 2 = Ein bisschen, 3 = Einigermaßen, 4 = Erheblich, 5 = Äußerst

1. Entschlossen
2. Aufmerksam
3. Wach
4. Angeregt
5. Aktiv
6. Ängstlich
7. Nervös
8. Verärgert
9. Beschämt
10. Feindselig

Nature Connection Index (NCI; Richardson et al., 2019)

Die folgenden Fragen beziehen sich auf Sie und die Natur. Mit Natur meinen wir alle Arten von natürlichen Umgebungen sowie alle Pflanzen und Tiere, die dort leben. Natur kann sich in der Nähe Ihres Wohnorts befinden, in Städten, auf dem Land oder in weiter entfernten Wildnisgebieten.

Falls Sie eine Option mit "1" beantworten möchten, müssen Sie den Regler anklicken.

Skala: 1 = Stimme voll und ganz zu, 7 = Stimme gar nicht zu

1. Ich finde immer Schönheit in der Natur
2. Ich behandle die Natur immer mit Respekt
3. In der Natur zu sein macht mich sehr glücklich
4. Zeit in der Natur zu verbringen ist mir sehr wichtig
5. Ich finde es wirklich beeindruckend, in der Natur zu sein
6. Ich fühle mich als Teil der Natur

Perceived Restorativeness Scale (PRS; Hartig et al., 1997)

Bitte geben Sie an, inwieweit die angegebene Aussage Ihre Erfahrungen in diesem Umfeld beschreibt.

Falls Sie eine Option mit "0" beantworten möchten, müssen Sie den Regler anklicken.

Scale: 0 = Gar nicht, 10 = Voll und ganz

1. Ich mag diese Umgebung.
2. Ich könnte mich in dieser Umgebung ausruhen und meine Fähigkeit, mich zu konzentrieren, wiederherstellen.
3. Zeit hier zu verbringen, gibt mir eine Pause von meiner alltäglichen Routine; es ist ein Ort, um von den Dingen wegzukommen, die normalerweise meine Aufmerksamkeit erfordern.
4. Dieser Ort ist faszinierend; Meine Aufmerksamkeit wird von vielen interessanten Dingen angezogen.

Mindful Attention Awareness Scale (MAAS-Short; Höfling et al., 2011)

*Unten finden Sie eine Sammlung von Aussagen zu **tagtäglichen Erlebnissen**. Bitte geben Sie an, wie häufig oder selten Sie derzeit jedes dieser Erlebnisse haben. Bitte antworten Sie so, wie Sie diese Dinge derzeit **wirklich erleben** und nicht, wie Sie denken, dass Sie die Dinge erleben sollten. Bitte behandeln Sie jede Aussage unabhängig von den anderen Aussagen.*

Scale:

Fast immer – Sehr häufig – Eher häufig – Eher selten – Sehr selten – Fast nie

1. Ich finde es schwierig, auf das konzentriert zu bleiben, was im gegenwärtigen Augenblick passiert.
2. Es sieht so aus, als würde ich "automatisch funktionieren", ohne viel Bewusstsein für das, was ich tue.
3. Ich erledige Aufträge oder Aufgaben automatisch, ohne mir bewusst zu sein, was ich tue.
4. Ich bemerke, wie ich jemandem nur mit einem Ohr zuhöre, während ich gleichzeitig etwas anderes tue.
5. Ich merke, wie ich Dinge tue, ohne auf sie zu achten.
6. Ich finde es einfach, auf das konzentriert zu bleiben, was im gegenwärtigen Augenblick passiert.
7. Ich erlebe viel Bewusstsein für das was ich tue.
8. Ich erledige Aufträge oder Aufgaben mit Bewusstsein dafür was ich tue.
9. Ich bemerke, wie ich jemandem voll aufmerksam zuhöre, ohne gleichzeitig etwas anderes zu tun.
10. Ich merke, wie ich Dinge tue, und dabei voll auf sie achte.

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)

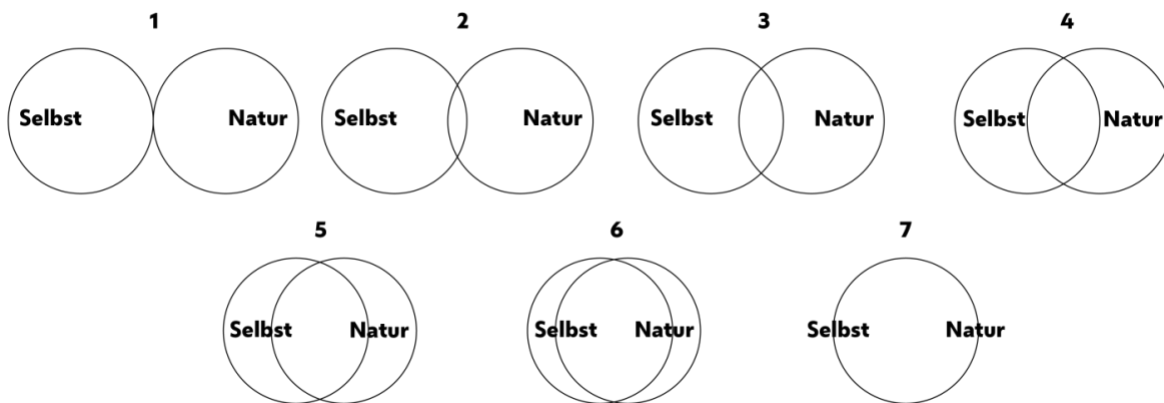
Bitte geben Sie an, in welchem Maße Sie die unten beschriebenen Erfahrungen während der 10-minütigen Aufgabe gemacht haben. Bitte antworten Sie so, wie Sie es wirklich erlebt haben, und nicht so, wie Sie meinen, dass Sie es hätten erleben sollen.

Scale: 0 = Gar nicht, 3 = Einigermäßen, 6 = Voll und ganz

1. Es fiel mir schwer, mich auf das zu konzentrieren, was geschah.
2. Ich habe etwas getan, ohne darauf zu achten.
3. Ich beschäftigte mich mit der Zukunft oder der Vergangenheit
4. Ich habe etwas automatisch getan, ohne mir dessen bewusst zu sein, was ich getan habe.
5. Ich habe mich durch etwas gehetzt, ohne wirklich aufmerksam zu sein.

Inclusion of Nature in Self (INS; Schulz, 2002)

*Wählen Sie bitte das Bild aus, das Ihre Beziehung zur natürlichen Umgebung **in diesem Moment** am besten beschreibt. Wie verbunden fühlen Sie sich mit der Natur **in diesem Moment**? („Selbst“ = Sie; „Natur“ = die Umwelt).*



Restoration Outcome Scale (ROS; Korpela et al., 2008)

Diese Aussage beschreibt meine Erfahrung des Besuchs hier

Scale: 0 = Gar nicht, 6 = Voll und ganz

1. Ich fühle mich ruhiger
2. Ich fühle mich erholt und entspannt
3. Ich habe eine neue Begeisterung und Energie
4. Meine Konzentration und Wachsamkeit haben deutlich zugenommen.
5. Ich habe die Alltagssorgen hier vergessen
6. Der Besuch hier hat meine Gedanken geklärt und klarer gemacht

Exploratory measures

1. *Gibt es etwas, das Sie uns über diese Erfahrung mitteilen möchten? (vielleicht was Ihnen gefallen oder nicht gefallen hat)*

Open format answer

2. *Würden Sie diese Erfahrung nochmal machen wollen? Mit Erfahrung meinen wir die 10-minütige Aktivität.*

Yes – No

3. Participants in the unguided condition could answer the following question: *Wie würden Sie in einem Satz zusammenfassen, was Sie in den letzten 10 Minuten getan haben?*

Open format answer

Abstract (German)

Diese Studie wendet die Kurzintervention zur achtsamen Förderung von Naturverbundenheit („Brief Mindful Nature Connectedness Intervention“ – B-MNCI) nach Muneghina et al. (2021) an und adaptiert sie, um deren Wirksamkeit im Kontext eines städtischen Parks zu überprüfen. Ziel ist es dabei, das Naturverbundenheitsgefühl der Teilnehmenden sowie ihre psychologische Erholung im Rahmen alltäglicher Erfahrungen im urbanen Raum zu stärken. Basierend auf dem Pathways-Modell nach Lumber, Richardson und Sheffield (2017) verwendet die angepasste Intervention eine 10-minütige Audio-geführte Achtsamkeitspraxis, welche speziell darauf abzielt, die sensorische Wahrnehmung, die emotionale Beteiligung sowie die Wertschätzung der Schönheit und Bedeutung von Natur zu fördern. Dabei orientiert sie sich explizit am konzeptionellen Rahmen der „Good Things in Urban Nature“ nach McEwan et al. (2020). In einer experimentellen Feldstudie wurden 47 Teilnehmende randomisiert auf drei Gruppen aufgeteilt: die B-MNCI-, die Mind-Wandering- und die ungelenkte Kontrollbedingung. Obwohl die B-MNCI zu einer signifikanten Steigerung der Zustandsachtsamkeit führte, konnten keine Gruppenunterschiede hinsichtlich Naturverbundenheit und psychologischer Erholung festgestellt werden. Dennoch berichteten Teilnehmende der B-MNCI- und Mind-Wandering-Bedingungen im Anschluss an die Intervention eine geringere negative Affektivität als die Kontrollgruppe ohne Anleitung, was auf positive emotionale Effekte strukturierter Beschäftigungsanweisungen hinweist. Diese Ergebnisse unterstreichen das Potenzial kurzer achtsamkeitsbasierter Interventionen im urbanen Kontext: Achtsame Interaktionen könnten demnach nicht nur zur Verbesserung der affektiven Befindlichkeit beitragen, sondern auch einen Zugang zu bedeutsamen Erfahrungen mit städtischer Natur eröffnen.