Off work to unwind in nature

– how can therapeutic gardens in urban parks benefit time-strapped working professionals?

Cindy Ong

Degree project/Independent project (30 credits)

Off work to unwind in nature – how can therapeutic gardens in urban parks benefit time-strapped working professionals?

Cindy Ong

Supervisor:	Fredrika Martensson, Swedish University of Agricultural Sciences Department of People and Society
Examiner:	Elizabeth Marcheschi, Swedish University of Agricultural Sciences Department of People and Society
Co-examiner:	Anna Litsmark, Swedish University of Agricultural Sciences Department of People and Society
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Swedish University of Agricultural Sciences
Faculty of Landscape Architecture, Horticulture and Crop Production Sciences
Department of People and Society

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Abstract

Living in a high-density, fast-paced city such as Singapore can be mentally and physically draining due to traffic, noise pollution, overcrowding, and other urban stressors. Poor mental health is becoming increasingly prevalent among working professionals aged 18 to 39. Therefore, it is crucial to find ways to support these individuals in improving their mental health and wellbeing. Therapeutic gardens, designed to support the mental health of older adults in Singapore, offer a promising respite from daily stressors and worries.

This study aimed to investigate how therapeutic gardens in public parks, primarily designed for elderly programs, were experienced by working professionals and to identify garden features that enhance or impede their restorative potential. Two therapeutic gardens, located in Sun Plaza Park and Sembawang park were chosen as study sites. Eight participants aged 24 to 33 were recruited for a self-guided garden stroll, during which they performed two intervention tasks: a deep breathing exercise and a photo-taking assignment to capture features or places in the garden that were experienced positively or negatively. After the stroll, participants sat down for a one-on-one semi structured interview. An emoji affective sheet was used to measure their emotional states before and after the stroll.

Data were analysed thematically, revealing that convenience, solitude, safety, serenity and opportunities for exploration and play are key considerations when choosing a place for relaxation and recovery. Sensory experiences related to sights, sounds, and touch were enhanced through the breathing and photo-taking assignments. Equally important were clear signage, garden tidiness, and the freedom to explore independently. The study suggested that gardens that were closed to homes or workplaces were preferred. Besides the garden's quietude as an escape from daily life, opportunities for play were highly valued. Directive signage and prescriptive approaches to garden experiences should be avoided. Engagement strategies like mindful interventions proved effective in raising awareness and enhancing the experience of the self-guided stroll.

Overall, these gardens have the potential to support recovery from daily stress and tension, offering play opportunities that enhance creativity. To fully optimise their benefits, it is essential to consider the combination of various components in designing a people-centric, restorative environment that meets the needs of working professionals.

Keywords: restorative environments, restoration theory, stress reduction, self-guided garden stroll, mindful interventions, play

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1. Introduction

1.1 Background

Living and working in an urbanised environment such as Singapore hold many benefits for the working professional such as strong economic growth, an education hub and innovation ecosystem, technological capabilities and a well-developed infrastructure (Anwar & Zheng, 2004; Chang & Das, 2020; Ferro-Escobar et al., 2022). Compared to many cities in the world, Singapore has consistently been placed favourably for quality of life (Tambyah et al., 2010). At first glance, the bustling city-state came across as one of the happiest places in Asia, offering a relatively high quality of life, with adequate healthcare, mobility and a place of safety (Tan & Tambyah, 2016). However, the 2022 Quality of Life (QOL) survey painted a less rosy picture: compared to five years ago, Singaporeans seemed to be less happy and felt "a decreased sense of achievement, control and purpose" ("Singaporeans less happy," 2024). In a fast paced and highly competitive society like Singapore, it is common and even normalised to work an average of 44 hours per week (Leu et al., 2023). In a way, it is no surprise that an Asia wide workplace mental health index report (2022) showed over half of the working adults surveyed in Singapore are stress-sensitive, with nearly half feeling mentally and physically exhausted after a work day (MacLennan, 2023). According to the National Population Health Survey (2022), the percentage of Singaporeans experiencing poor mental health rose from 13.4 percent in 2020 to 17 percent in 2022 (Yang, 2023). Young people aged 18 to 29 accounted for 25.3 percent of those with poor mental health, while those aged 30 to 39 made up 19.4 percent (Ganesan, 2023; Teo, 2024).

With up to 80% of Singapore's population living in concrete high-rise housing, it is crucial that people are presented with opportunities to connect with nature. It's been said that "high-rise buildings work against nature" and that urban high rise living has also isolated man from others (Yuen, 2005). As early as 1967, in an effort to create a green and liveable city, a sizeable proportion of the land has been allocated to greenery. These greening efforts have resulted in the proliferation of tree-lined streets, gardens and parks of varying sizes in almost every corner of the city. Since 2016, green spaces such as therapeutic gardens that are purposefully designed to enhance the mental wellbeing of users have been added in public parks (Thian, 2023). Currently, there are 13 such gardens and plans are underway to make room for a total of 30 therapeutic gardens in 2030.

It bears mentioning that the use of a garden for healing is not a modern day concept. From the early days of hospice gardens at monasteries in Europe to plant-centred rehabilitative activities for veterans in the United States, therapeutic environments such as therapeutic gardens with health promoting potential have come a long way (Gerlach-Spriggs et al., 1998; Ulrich, 2002). The term, 'therapeutic' and 'healing' landscape or garden has been used interchangeably in many existing literature to reference natural environment that is utilised as a form of therapy, for specific target groups, as well as for the general wellbeing of other users (Pouya & Demirel, 2015). In Singapore, *therapeutic garden* is defined as an outdoor garden space that is purposefully designed "to meet the physical, psychological and social needs of the people using the garden" (National Parks Singapore, n.d.). For ease of reference, and to avoid any confusion, this naming convention will be used to refer to the study sites. Several studies have been conducted in Singapore on the subject of therapeutic landscape and intervention but they were skewed towards the elderly population and included nature-based programming like horticultural activities (Sia et al., 2018; Sia et al., 2020). Due to cost and resources, these horticultural activities are scheduled once a month and tailored for organised groups from nursing homes or elderly from the general public. In short, outside of programmatic activities, these therapeutic gardens tend to have limited usage. On this basis and considering the significant work that goes into planning of these public green spaces, how can we encourage more people, specifically working professionals, to utilise these therapeutic gardens?

1.2 Nature and health

Contact with nature is believed to be both healing and enabling. In fact, the connection between nature and health has been a topic of interest for centuries. Walden, a book by Henry David Thoreau, a nineteenth-century American writer and naturalist, is often regarded as one of the much-talked-about scientific literature that contributed to the discourse on the healing properties of natural environments (Brady, 2003). Even though healing components of nature can be traced back eons ago, many believe that his nature writings laid the foundation for future research on the therapeutic effects of human-nature interactions. Other proponents of nature's value believe that human beings have an innate affinity to other living organisms. Biophilia, a term that aptly describes our co-evolution with nature and our inherent need for nature, has been popularised by Edward O. Wilson, an American sociologist (1984). According to *The Practice of Biophilic Design*, a book by Kellert & Calabrese (2015), this intrinsic inclination and

affiliation towards nature has to be fostered and reinforced for it to be effective in supporting our needs.

In today's built environments, it appears that our way of living has reduced our contact and interactions with nature (Schultz, 2002). However, on a more positive note, numerous studies over the past decade have shown that spending time in green spaces can benefit various aspects of our health. A growing body of evidence supports the positive impact of green spaces in promoting physical and mental health (Stigsdotter et al., 2010; Callaghan et al., 2021), cognitive functioning (de Keijzer et al., 2016; Jimenez et al., 2022) and social engagement (Jennings & Bamkole, 2019).

1.3 Restorative benefits of natural environments

Going beyond the extensive research supporting the health benefits of exposure to nature, additional studies are now focusing on investigating the mechanisms that contribute to this improved health (Repke et al., 2018). According to Repke and colleagues, among the many mechanisms that supported the positive outcomes of nature exposure, significant studies have focused on the restorative component of natural environments. Restoration is defined as the psychological and physiological state of recovery or renewal from diminished or depleted daily functions and capabilities (Hartig, 2004, 2007; Korpela et al., 2014). The two prominent bodies of theoretical work that supported the restorative effects of exposure to natural environments are the Attention-Restoration Theory (Kaplan & Kaplan, 1989; Kaplan, 1995) and the Stress-Reduction Theory (Ulrich, 1999). Kaplan's theory proposes that contact with nature can restore the state of "directed attention fatigue" where one's attentional resources are compromised or depleted as a result of sustained exposure to activities that are mentally exhausting. According to the Attention Restoration Theory, the depletion of one's cognitive capabilities can be recovered in natural settings that possess the four characteristics of *being away, extent, fascination* and *compatibility* (Kaplan and Kaplan, 1989; 1995). In other words, a restorative environment comprises a compatible setting that supports the needs and goals of the individual; facilitates 'being away' such as offering a change of scenery to escape from the everyday environment; produces effortless 'fascination' and projects an entirely different world.

Stress Reduction Theory, on the other hand, posits that connectedness to nature can play an important role in the recovery from stress. Based on the theory, our affective responses to stress recovery is driven by our evolutionary adaptive trait

for survival. This innate connection with nature elicits a positive emotional response, keeping negative thoughts in check, which reduces stress and contributes to restoration (Hartig et al., 2014). It is thus believed that a physical environment that possesses the following components are important for stress reduction and recovery: *sense of control, social support, physical movement and exercise, and positive natural distractions*. Even though Attention Restoration Theory is about cognitive process and effort while Stress Reduction Theory is more on affective emotions, both theories are based on the restorative benefits of nature.

To date, there is an expansive body of research that builds on the restorative effects of nature exposure (e.g., Menardo et al., 2019; Wyles et al., 2019; Song et al., 2022; Goncalves et al., 2023). This study is focused on researching the restorative effects of natural environments such as gardens and parks that are accessible to people living in cities. One such example was the study by Hartig and colleagues (1991) where participants were randomly assigned to one of three groups for a 40-minutes walk: first group walked in an urban area populated with nature; second group walked in a relatively attractive and safe urban area, while third group listened to music or read. The group that walked in nature experienced greater positive affects compared to the other two groups. Another study which compared the restorative effects of urban natural environment versus urban areas found the former to be more restorative (Hartig et al., 2003). Similarly, a study that compared walking in nature in the city with viewing nature on screens or using treadmill in a gym after a stress induction, showed that walking in nature resulted in greater restorative effects on mood and stress levels than the other two scenarios (Olafsdottir et al., 2018).

Studies have also supported that natural environments improved cognitive abilities, which can be especially valuable at workplaces. For example, results from a field study showed that individuals performed better at proofreading following a wilderness trip compared to individuals in a control group (Hartig et al.,1991; Hartig, 2021). In another study, three student groups underwent a mental challenge test: one viewed natural scenery, another urban landscapes, and a control group had no visual stimulus. Those viewing natural scenes outperformed the other groups in a digit span test (van Oordt et al., 2022).

Even though factors such as scale, duration and type of nature exposure may differ, densely built cities such as Oregon, Chicago and Ohio, with smaller and more compact areas of nature have shown the potential for restorative outcomes (Beatley, 2009). Additionally, a multi-study using data from ten UK studies

reported that a mere few minutes of physical activities in green environments could also be restorative (Barton and Pretty, 2010).

1.4 Nature-based restorative interventions

Similar to the numerous natural settings that support restoration, nature-based interventions or programs that provide restorative benefits can take various forms (Gritzka et al., 2020; Taylor et al., 2022): nature walk, forest bathing or forest therapy, and horticultural therapy, just to mention a few. Often, these interventions can either be guided or self-exploratory. A systematic review of nature walk interventions supported that nature walk has the potential to improve depression and anxiety levels (Grassini, 2022). Using forest bathing as a wellbeing intervention, a study in the UK showed "improvements in positive emotions, mood disturbance, rumination, nature connection and compassion" among its participants (McEwan et al., 2021). Based on the study by Kim & Shin (2021), self-guided forest therapy appeared to encourage self-reflection whereas guided forest therapy supported social interactions and effected positive emotions. Another recent study also supported the healing benefits of self-guided programs in improving mood states which could affect learning and performance at work, and contributing to better mental health by reducing anxiety (Shin et al., 2023).

In addition to nature walks, sensory stimulations and role-playing scenarios were examples of engagement plans and activities that were included in nature walk study which resulted in improved mood and attentional capacity (Duvall, 2011). Finally, active engagement in the form of psychological tasks performed during nature walks (Pasanen et al., 2018) or mindfulness practices such as meditation in natural environments (Lymeus et al., 2018) also supported a certain degree of self-reported restoration.

In light of the restorative benefits of natural environments and the promising outcomes of nature-based interventions, the questions this thesis hoped to answer are as follows: is the current garden setup suitable as an outdoor break resource for working professionals? If not, what else can be done to improve or adapt the garden to serve the needs of individuals who are likely to experience high levels of stress? Young working professionals aged 18 to 39 were chosen as the target demographic because they constitute a significant portion of individuals vulnerable to mental health issues and therefore could potentially benefit from this restorative resource.

Before we delve deeper, it is worth mentioning that previous studies in Singapore have explored passive exposure to therapeutic environments with

contemplative qualities among both healthy individuals and those clinically depressed (Olszewska-Guizzo et al., 2022); horticultural therapy targeted at older adults (Ng et al., 2018); and therapeutic horticulture that enhanced the psychological wellbeing of elderly (Sia et al., 2018). In other words, to the best of my knowledge, this line of inquiry directed at working professionals in therapeutic gardens has never been done in Singapore.

1.5 Aims

The aim of this study is to explore how therapeutic gardens in public parks, originally developed for organised programs mostly for the elderly, can be adapted for use by working professionals seeking recovery from a stressful workday.

This study seeks to investigate the following questions:

1. How do working professionals experience a self-guided garden stroll that includes a deep breathing exercise and a photo elicitation task capturing both positive and negative aspects of the garden?
2. Do such gardens provide restorative benefits for working professionals? Specifically, which elements of the garden contribute to or hinder these restorative effects?

2. Method

2.1 Research Design

This exploratory investigation of the role of therapeutic gardens for working professionals was carried out in two gardens. Participants were invited to take a stroll in one of the two gardens. Prior to the stroll and after the stroll, participants were asked to complete a self report emoji affective measure to indicate their emotional state. Data were obtained through on-site, one-on-one semi-structured interviews which took place after participants had independently completed a breathing exercise and a photo-taking task.

The design of this study was influenced by forest bathing and nature therapy studies, as well as nature-based restorative programs at urban parks. In particular, the case study on self-guided forest healing programs in Korea (Shin et al., 2023) and the Bloedel Reserve's *Strolls for Wellbeing* forest garden program in Washington, United States, provided the inspiration to investigate the restorative potential of urban gardens in public parks. Even though 'walk' and 'stroll' are often used interchangeably to denote movement on foot, 'stroll' was selected to

connote a more leisurely and relaxed manner, typically without a specific destination. The decision to set a minimum duration of 15 minutes in the garden was informed by a scoping literature review. This review revealed that even a brief exposure of 10 minutes to nature has a positive effect on the mental health of college-aged students (Meredith et al, 2020).

The affective model with the two dimensions of valence and activation was used to measure the emotional experiences of participants before and after the stroll. This model was extracted from a study by Westman and colleagues (2013) on children's affective experience of everyday travel. Core affect, "the most elementary consciously accessible affective feelings" (Russell & Barrett, 1999), was chosen as a construct rather than mood as affect tends to be more fluctuating while mood is more pervasive and prolonged (Ekkekakis, 2013). Although the prospect of delving deeper into the participants' emotional states before and after the stroll may be appealing, this study chose to establish a baseline using a quick and simple assessment method. Importantly, the decision to use this scale was influenced by both the Attention Restoration Theory and the Stress Reduction Theory. Attention Restoration Theory posits that spending time in nature can alleviate mental fatigue and enhance attention, whereas Stress Reduction Theory emphasises the improvement of one's affective state in natural settings. In other words, employing this straightforward scale enabled the capturing of both emotion and cognition, which are considered interconnected and fundamental to our psychological functioning and overall well-being (Pessoa, 2008). Additionally, Ulrich (1999) noted that positive affective reactions to nature occur relatively quickly, making this measure suitable for assessing before and after effects of the garden stroll. Although this scale is more commonly employed in quantitative studies, its use in this context leaned towards an exploratory approach rather than detailed analysis.

The sequence of tasks, starting with deep breathing before photo-taking, was an attempt to initiate a state of relaxation and awareness (Noble & Hochman, 2019; "*Relaxation techniques,"* 2020). Literature on engagement strategies and 'awareness plans' as discussed by Leff (1984) and Duvall (2013) provided the grounds to explore an intervention that was relatively easy to operationalise. Specifically, the visual method of participant-driven photo elicitation was used as a way to create mindfulness and awareness.

Similarly, the active involvement of the participant in photo-taking, followed by the interview was likely to spark conversations and produce a richer representation of how the garden was perceived and used (Harper, 2002). Questions were worded and phrased to reflect emotions and behaviour such as

'smile,' curious' and 'interested.' These references were partially extracted from the list of positive affect from the PANAS (Positive and Negative Affect Schedule) questionnaire developed by Watson and colleagues in 1988.

As the study was intended to be exploratory in nature, it warranted a mention that no control mechanism was put in place. In other words, no control group was developed as the study was not meant to establish causal relationships. In short, the study hoped to uncover new insights, identify ideas and highlight potential variables for further studies.

2.2 Study Sites

The two therapeutics gardens that were selected as study sites were located in Singapore within Sembawang Park and Sun Plaza Park respectively. They were chosen as they represented two of the most recent therapeutic gardens that were built and opened to the public in October 2023. In other words, they were not chosen with the intention to compare the two sites. Offering participants the option to choose one of the two sites was also an attempt to minimise location-based biases so that the results were not solely based on the characteristics of a single site. Conceptually, the two study sites had similar composition and features such as a foot reflexology path; plants that attract butterflies; area with raised planters; a covered pavilion; nature-inspired play spaces; signages with map of the garden and information about plant species, including benches that were scattered throughout the garden. See **Table 1** for an overview of the characteristics of the gardens. Also, see **Figure 1** for the maps of both the sites with corresponding photographs.

Table 1

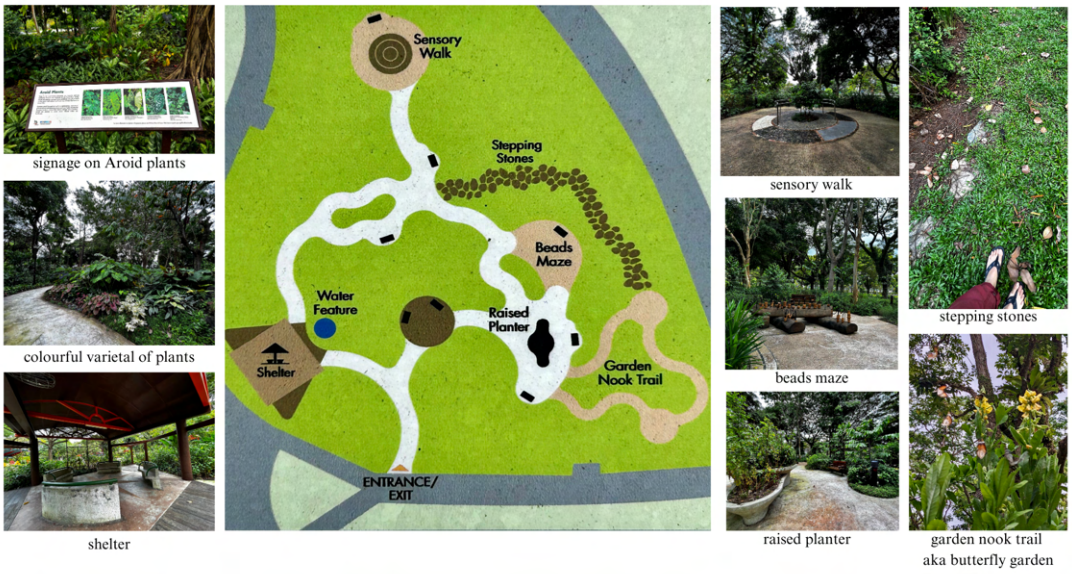
An overview of the two study sites

	Therapeutic garden@SunPlaza Park	Therapeutic garden@Sembawang Park
Park size	9-hectare park in north-east region.	15-hectare beach-side park in northern region.
Park facilities	Amphitheatre, dog run area, wood-ball course, playground.	Allotment garden, dog run area, fitness corner, playground, barbecue pits, beach area.
Visitorship	Residents from nearby neighbourhoods.	Residents from nearby and people living in northern part of Singapore; picnic, barbecue, beach activities.
Garden size	1,700 square metres.	2,200 square metres.
Similar garden features	Plants that attract butterflies, foot reflexology path, raised planters, covered pavilion and benches. Both gardens have maps and signages on plant info.	
Differing garden features	Large and colourful varieties of aroid plants; playspaces with musical contraption and beads maze for children. Water feature not available.	Active & passive zones, mini water feature, fitness equipment, trellises, forest classroom, nature playscapes like tepee and wooden stumps for children.

Note. Information summarised from *Therapeutic garden at Sembawang Park*. (n.d.). National Parks Board. Retrieved April 26, 2024, from https://beta.nparks.gov.sg/visit/parks/sembawang-park/amenities/therapeutic-garden and *Therapeutic garden at Sun Plaza Park*. (n.d.). National Parks Board. Retrieved April 26, 2024, from https://beta.nparks.gov.sg/visit/parks/sun-plaza-park/amenities/therapeutic-garden

Figure 1

Maps of both sites and their corresponding photographs



Note. Therapeutic garden at Sun Plaza Park. Map retrieved from signage at entrance/exit of the garden

Note. Therapeutic garden at Sembawang Park. Map retrieved from signage at entrance/exit of the garden

2.3 Participants

A total of 8 working professionals in Singapore aged 24 to 33 were recruited as participants through convenience sampling. Participants were either referred by friends, ex-colleagues or acquaintances. Demographic information such as age, gender and occupation were collected. See **Table 2** for details. There were 5 males and 3 females. None of the participants had visited the study sites beforehand. Half of the participants considered themselves to be regular park users who visit

parks close to their homes, whenever they can find the time. For the study, 5 participants visited the therapeutic garden at Sun Plaza Park while 3 participants visited the therapeutic garden at Sembawang Park.

TABLE 2

Pseudonym for participants with gender, age and occupation

Pseudonym	Gender	Age	Profession	Garden visited within following park
Harry	Male	33	Marketing consultant	Sembawang Park
Kelvin	Male	31	Documentary film producer	Sun Plaza Park
Alan	Male	31	Sports digital content creator	Sun Plaza Park
Joseph	Male	27	Aspiring music producer	Sun Plaza Park
Linda	Female	26	Product development - Sports	Sun Plaza Park
Michael	Male	25	Programmer	Sembawang Park
Florence	Female	24	Speech therapist	Sun Plaza Park
Hannah	Female	24	Engineer - Maritime	Sembawang Park

2.4 Materials

Affective scale measure

The self report emoji affective measure was used to ascertain if participants experienced a change in affect pre-stroll and post-stroll. This simple self-report measure comprised a set of emojis with two bipolar scales of valence (*happy-sad*, *cheerful-angry*, *laughing-grouchy*) and activation (*tired-attentive*, *sleepy-awake*, *dull-alert*). The affective scale was presented on a printed sheet. See **Figure 2** for a sample of the emoji affective scale sheet. This sheet was completed by the participants prior to the stroll and immediately following the stroll. The immediacy of the question after the stroll ensured that the affect was captured with minimal time lapse and interference.

Intervention assignments

Breathing exercise

Participants completed a simple breathing exercise which entailed taking 10 deep breaths at a spot of their choosing. This exercise was intended as a reset to help them clear their minds and bring attention to the immediate environment.

Photo-elicitation task

Participants took photos that reflected “places, features or elements in the garden which they find especially beneficial in supporting your needs. For example, “places, features or elements in the garden that are pleasing to you,

make you smile, make you relax or make you curious and interested." Finally, they were asked to take photographs to show anything in the garden that did not support their needs or could be improved. Photographs taken by participants were used as visual probes and stimuli for reflection. A total of 64 photos were shared by participants.

Interview

The participant met with the interviewer at a pre-agreed bench that was out of view but in close proximity to the garden. This was done to allow participants to stroll freely without the feeling of being watched. One-on-one semi-structured interview was conducted. A map of the garden was printed for easy referencing and to aid recall. The interview started with a participant-led dialogue where the participant was given the opportunity to share freely how they felt while walking in the garden. The next part of the dialogue was researcher-led and included open-ended questions where participants were asked about their garden and task experiences. Open-ended questions were formulated to understand how the garden was experienced by participants and to facilitate follow-up probes. For example, "Imagine you had a long day at work today or that you have worked very hard on project for a while now and feeling drained. How would taking a walk in this garden make you feel?" To facilitate in depth sharing, specific questions such as "Tell me more about the place or spot you had chosen to do the breathing exercise" and "What about the features or elements here that prompted you to take the photograph?" Prompts and clarifications of their sharing were made possible through open-ended inquiry such as "In what way…?"; "How is that so…" In addition, general questions pertaining to the participant's work environment were asked to ascertain the typical number of working hours and to get an indication of workload and work pressures. To sum up the interview, participants were asked to describe what comes to mind when they think of the term 'therapeutic gardens or therapeutic environments.' Finally, they were asked if there was anything else they would like to add about their experience and if they would visit the garden again. With no further questions, the interview concluded and participants were thanked for their time and participation. The interview was audio-recorded and transcribed verbatim. See **Appendix** for a copy of the interview guide.

Figure 2

Emoji affective sheet to be completed before and after the stroll

To indicate on sheet *before* the stroll

To indicate on sheet immediately *after* the stroll

Note. Extracted from a study by Westman, J., Johansson, M., Olsson, L. E., Mårtensson, F., & Friman, M. (2013). Children's affective experience of every-day travel. *Journal of Transport Geography*, *29*, 95–102. https://doi.org/10.1016/j.jtrangeo.2013.01.003

2.5 Procedure

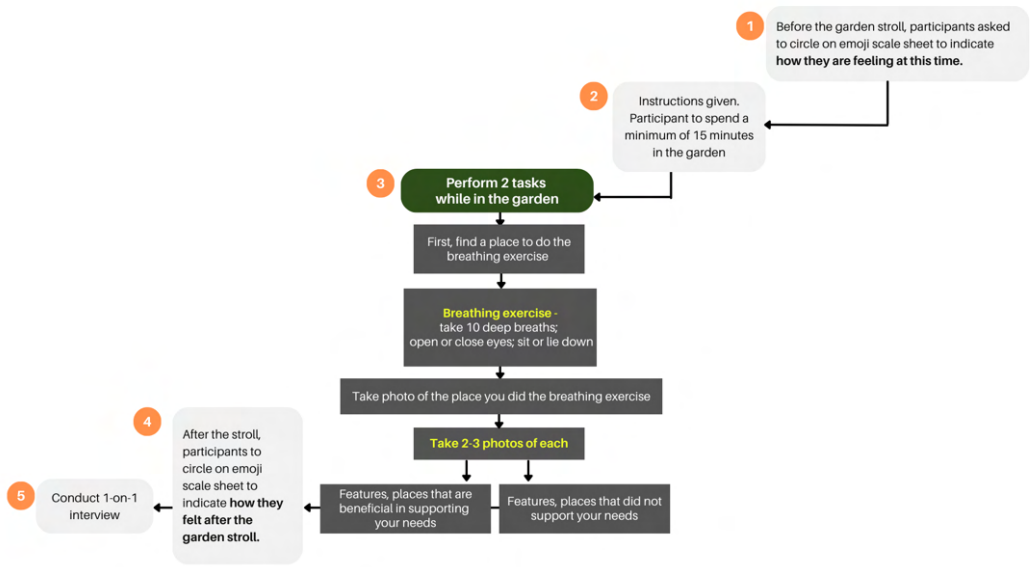
As part of the recruitment process, an invitation letter with information about the study and contact information was shared with potential participants. Following confirmation of participation, details such as date, time and how to get to the site were provided.

The stroll and interview were conducted between March 6 and March 12, 2024. Dates and timing of the study were chosen based on the availability of participants. For weekdays, 1 session took place in the early morning before work, and 4 sessions were conducted in the evening after work. For weekends, two participants chose the morning session while one chose the evening. None of them opted to do the study during lunch hour as midday scorching temperature was not conducive for outdoor activities. Participants were given the choice between a therapeutic garden at Sembawang Park or Sun Plaza Park. Individually, participants spent between 20 to 30 minutes in the garden and between 30 to 60 minutes for the one-on-one interview. As Singapore is in the tropics, daily temperature does not vary significantly throughout the year. It is generally hot and humid with two monsoon periods. For the morning session, the weather was clear with an average temperature of 27 to 30 degree celsius. Weather was slightly warmer for the evening session, with an average temperature of 30 to 32 degree celsius.

On the day of the study, informed consent was obtained. Participants were briefed on the purpose of the study and were given instructions on the tasks. See **Figure 3** with flowchart that illustrated the steps.

(1) Prior to the stroll, participants were asked to circle on an emoji scale sheet to indicate how they feel.
(2) Next, an instruction sheet with a set of tasks to be performed in the garden was handed to participants. Participants were informed to spend a minimum of 15-minutes in the garden.
(3) In the garden, participants would perform two tasks. First, find a comfortable spot in the garden to do a simple breathing exercise: take 10 deep breaths. After completing the breathing exercise, take photographs of the spot where they did the breathing exercise. Thereafter, proceed with the stroll; take 2-3 photographs of places or features that benefitted them and 2-3 photographs of those that did not support their needs or could be improved.
(4) After the stroll, participant met with interviewer at a nearby park bench. Here, a new copy of the same emoji scale sheet was handed to participants to indicate how they felt after the garden stroll.
(5) Following that, one-on-one semi-structured interview was conducted. A map of the garden was printed for easy referencing and to aid recall. The interview started with a participant-led dialogue where the participant was given the opportunity to share freely how they felt while walking in the garden. The next part of the dialogue was researcher-led and included open-ended questions where participants were asked about their garden and task experiences. Finally, with no further questions, the interview concluded and participants were thanked for their time and participation. The interview was audio-recorded and transcribed verbatim.

Figure 3



Flow chart illustrating the steps and instruction of the investigation

2.6 Data Analysis

The research questions guided the data analysis. Using both the participants' photographic images and interview transcripts, thematic analysis was performed (Braun and Clarke, 2013, 2022). Before commencing the data analysis, audio recordings were transcribed within a day or two after the interviews to ensure accurate representation of what was shared and discussed. An AI-based transcription software was used (Otter) to convert verbal data to written form. Following that, audio recordings were replayed and checked against the software generated transcript for accuracy. Manual edits were done accordingly to ensure rigour of the transcription process. Next, the text transcription of each interview was individually read and reviewed. With each reading, key aspects mentioned by each participant were highlighted. This process was repeated for all transcripts. A preliminary round of themes were then noted for each participant. Themes from all eight participants were collated into a table, including a column with their respective verbatim quotes. This process of immersing in the data took several weeks. Topics were categorised based on what participants shared such as features, elements and characteristic of the gardens in relation to its surroundings - size of garden relative to park, spaces that were open or secluded, sensory stimuli like sight, sound, touch and smell, tasks relating to the breathing exercise and

photo-taking, as well as the concept of therapeutic garden, its location and lack of awareness. After the first round of coding, there was a one-week hiatus to disengage from the data before returning with a fresh pair of lenses. The next round of coding sought to organise and subsume overlapping topics, which resulted in the identification and classification of themes and sub themes.

2.7 Ethics

Prior to the recruitment, a written letter about the study was presented to prospective participants. Upon confirmation of participation, informed and verbal consent was obtained from participants. On the day of the study, the purpose of the study and how the information from the study will be used, were clearly explained to the participants. Participants were aware that their participation were voluntary and they had the right to withdraw at any time. Contact details were provided should they choose to reach out to the student researcher or her supervisor at a later stage. No names or photos of the participants were collected or published. Instead pseudonyms were used for all participants. Interviews were conducted and audio were recorded. Participants were informed that the interviews would be treated confidentially and all recordings would be erased following the publish of the study.

Caution was taken to minimise personal bias throughout the study. In developing the interview guide, leading questions were avoided and an exploratory structure with broad topic categories was used to facilitate open dialogue and active listening. Instead of approaching the interviews as an “expert” with the knowledge from the master’s programme and scientific literature, a beginner’s mindset was adopted, allowing participants’ sharing to guide the conversation. During data extraction and analysis, continuous reflection on the participants’ input was exercised to accurately capture their experiences and to reduce personal bias. This involved immersing in the data and validating interpretations against what was articulated by the participants.

The use of audio transcription software (otter.ai) without prior approval was an oversight. Nevertheless, transcribing using the AI transcription tool (otter.ai) was carried out with caution. Pseudonyms were used for all transcriptions, ensuring no identifiable information was included. Participants were informed beforehand about the use of a third-party speech-to-text transcription software, and they were made aware of how their data would be processed and that recordings would be erased after the study. Additionally, to ensure accuracy of the interview transcripts, AI-generated transcripts were manually verified and corrected.

3. Findings

Overall, working professionals who participated in the garden stroll welcomed this opportunity to spend time in nature and took it as a chance to take a pause from the hustle and bustle of everyday life. It was not part of the recruitment criteria, but all participants seemed to hold a certain degree of affinity for nature. Many shared that they used to visit parks that were closed to their homes, whenever they can find the time.

According to the self-report affective sheet, 7 of the 8 participants showed an improvement in at least one of the two dimensions of valence and activation based on how they felt before and after the stroll. Besides feeling relaxed, many felt energised in the present of nature - 6 participants circled the emoji which was closer to the state of being *awake, alert, attentive* to indicate how they felt after the stroll. The results of each participant's self report scale (pre-stroll and post-stroll) were indicated in **Table 3**. A numeric value of 1 to 5 was assigned to each of the emoji. An average was calculated based on the numeric representation. The diagram in **Figure 4** illustrated the positive shift in affect before and after the garden stroll.

TABLE 3

Results of the self report affect scale - (left) pre-stroll and (right) post-stroll

Pre-stroll: How do you feel now?

Valence						
		Alan	Linda			
		Florence	Michael			
	Joseph	Kelvin	Hannah	Harry		
happy cheerful laughing						*sad angry grouchy*
Numeric representation	5	4	3	2	1	
Total	5	12	9	2		
Average 3.5						

Pre-stroll: How do you feel now?

Activation						
		Alan				
		Joseph		Linda		
		Florence		Hannah		
		Michael	Harry	Kelvin		
attentive awake alert						*tired sleepy dull*
Numeric representation	5	4	3	2	1	
Total		16	3	6		
Average 3.125						

Post-stroll: How do you feel after the garden stroll?

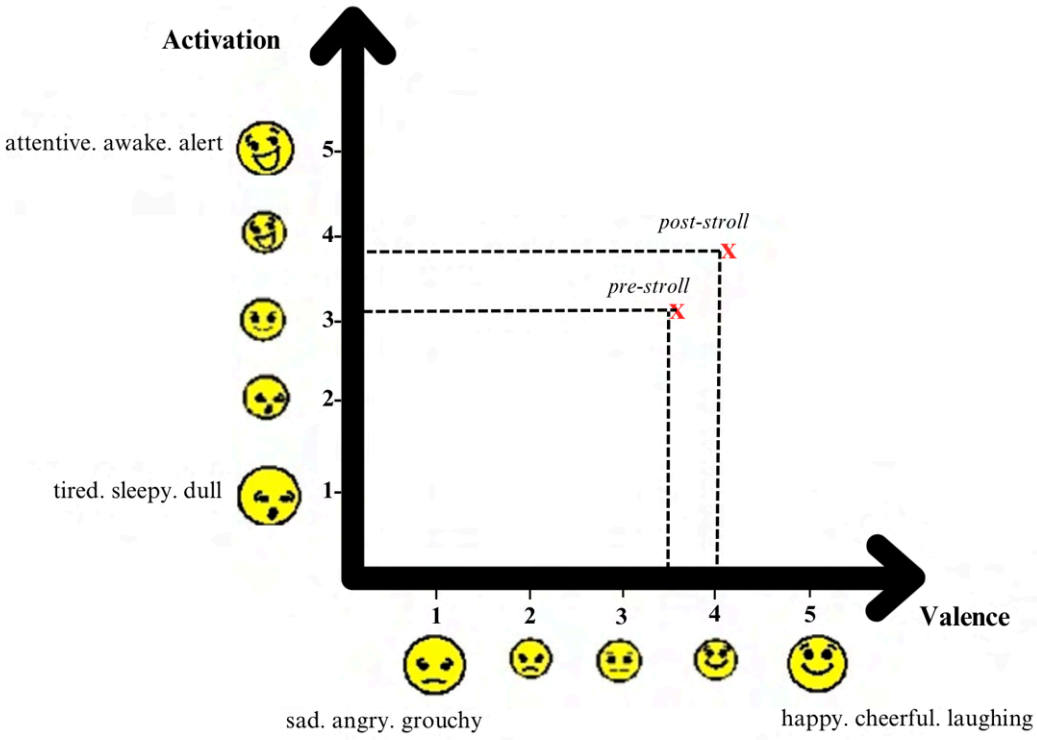
Valence						
	Alan		Linda			
	Joseph	Michael	Harry			
	Florence	Kelvin	Hannah			
happy cheerful laughing						*sad angry grouchy*
Numeric representation	5	4	3	2	1	
Total	15	8	9			
Average 4.0						

Post-stroll: How do you feel after the garden stroll?

Activation						
		Alan				
		Harry				
		Joseph				
		Michael				
		Hannah	Linda			
		Kelvin	Florence			
attentive awake alert						*tired sleepy dull*
Numeric representation	5	4	3	2	1	
Total		24	6			
Average 3.75						

Figure 4

Average change in affect pre-stroll and post-stroll



Note. The diagram illustrates the average change in affect pre-stroll and post-stroll. x-axis represents valance scale and y-axis represents activation scale.

Five themes were identified to inform how participants perceived and experienced the respective therapeutic garden: (1) Need for convenience, comfort, and on one's own terms (2) Being in the moment (3) Solitude and away from people (4) Feeling calm and energised (5) Size matters but so are safety, serenity and openness. Lastly, when referring to 'the garden' in the findings, no distinction was made between the two sites. In instances where the reference applied to only a specific site, the name of the garden was highlighted. **Table 4** showed a summary of the five themes with accompanied sub-themes and brief descriptions.

Table 4

Five themes identified from data. Subthemes and descriptions are included

Key Theme	Subthemes	Description
1. Need for convenience, comfort, and on one's own terms	Convenience and comfort	Due to busy lifestyle, time factor is a key consideration. Hence, a conveniently located garden was important. Comfort - attire to feel at ease, weather condition, presence of biting insects such as mosquitoes; tidiness of environment and cleanliness all linked back to comfort.
	One's own terms	Control and freedom to decide what and how they choose to interact in the garden i.e. leave room for possibilities and not to be prescriptive when providing information - less 'tell' and more 'show.'
2. Being in the moment	Mindful activities that helped participants relax and be more in tune with nature	Breathing exercise helped to clear the mind and get "in the right mind frame"; helped to reset - "settle me down, bring me back to a balance"; "doing the breathing exercise before taking the walk proper, also calmed me" and made me "more aware." Photo taking helped participants notice what was around them. In noticing, they also get to interact and appreciate more of nature. Overall both tasks helped distract participants and made them *"focus on something that is not related to work."* Importantly, being mindful helped to deepen one's sense of connection with nature and perhaps even elicit deep reflections about life in general.
	Feeling immersed in nature: sight, sound, texture	Sensory stimuli in the garden delighted participants, captivated them and held their interest. For some, presence of people, footsteps and vehicular traffic periodically disrupted the tranquility.
3. Solitude and away from people	An escape from the everyday stressors; seeking sense of privacy and seclusion	Spaces that afford the opportunity to be away from work, from everyday grind; no judgement; to unwind, be still. Presence of people disrupted the sense of solitude. "Being alone" does not mean "no people" but like minded people with mutual understanding and purpose for being in the garden.
	A place to reflect	Being in solitude could heighten awareness and foster self-reflection.
4. Feeling calm and energised	A state of relaxation and peacefulness	Natural environment such as the garden could offer opportunities for both relaxation and exploration. In other words, both outcomes were not always mutually exclusive. Being calm and relaxed were mentioned throughout the course of the interviews. Likewise, nature also facilitated elements of discovery, where one lost track of time while exploring.
	Things that interest me, make me curious and want to explore	
5. Size matters but so are safety, serenity and openness	Physical size versus sense of spaciousness	Subjective experience that relates to perceived size and spaciousness.
	Safety, serenity, open (exposed) versus enclosed space	Enclosed space affected perceived safety and threats; can also be claustrophobic for some. However, visual access was not limited to size or how open a space is. Open space tends to be less effective in filtering out unwanted noises; also certain activities such as breathing practice was better suited in a space that offered serenity which an open space typically lacked.

3.1 The need for convenience, comfort and on one's own terms

Location was a recurring subject in this study. Due to their hectic lifestyle and living in a somewhat chaotic city environment, many participants cited the location of the garden as a potential barrier. It so happened that none of the participants live or work in close proximity to the chosen gardens. In fact, half of the participants mentioned that they visited parks that were close to their homes for exercise, to walk their dogs or to meet with friends. Harry talked about

efficiency and how clocking in some form of physical activity while at the park was akin to “killing two birds with one stone.” Most of them visited the park or other outdoor spaces on weekdays and typically after having dinner with their families. This was done out of practicality as temperature is much cooler in the evening and many struggled to wake up early in the morning. Some also felt that evenings are quieter and more peaceful, with less traffic and human activity.

Another subject that was often talked about was comfort. One participant who came to the garden straight from work highlighted that she would feel more at ease if she was able to change out of her work clothes and remove her makeup. Another aspect that was related to comfort was the worry about being bitten by mosquitoes. In tropical Singapore, mosquitoes are ubiquitous and tend to be most prevalent and active during the monsoon season, as well as at dawn and dusk. Therefore, concerns about mosquito bites were particularly valid for those who are especially susceptible.

Comfort also extended to tidiness and cleanliness. The disheveled appearance of plants on raised planters, and the Stepping Stones trail that was not immediately visible due to overgrown grass, showed the lack of care and attention. Alan felt that more could be done to ensure proper care and upkeep. To him, “the planter is not maintained very well…it's quite ugly. So like, I wouldn't want to sit there.” Similarly, Harry expressed his shock when he saw the wilted plants: “that jolted me a bit…I came here, and then the plants all die…the wilted plants really caught my attention and was a bit disappointed by that and I walked out.” Likewise, due to the perceived unhygienic state of the textured pathway at both the Butterfly Garden (Sembawang Park) and the Sensory Walk (Sun Plaza Park), most participants did not warm up to the notion of walking barefooted and many considered it an inconvenience to remove their footwear. See **Figure 5** which showed wilted plants on planters, overgrown grass and textured pathways that were considered as unhygienic.

Many participants also talked about the freedom to choose and to “experience it [the garden] on my own” rather than “be told what to do with it.” In fact, many regarded the labelling of the garden and the information on the signages to be overly prescriptive. The classification of a garden as therapeutic would dictate how it should be used. In other words, rather than being told precisely how they should interact in the garden, they prefer to stay open to possibilities. Joseph believed that therapeutic garden gave the impression that users are in need of some form of therapy:

> I think when you say the word therapeutic, you probably already have this preconceived notion of therapy, which means you are trying to rehabilitate something, like something is wrong or not working well. That's just my impression.

Linda echoed Joseph's sentiment and felt that the demarcation of the garden from the larger park area was not necessary. Labelling and segregating the garden from the wider confine of the park limits possibilities. Instead, she made the following suggestion:

> Not label them. It opens up [more possibilities] for people to explore. A bit like the exercise corners in parks. It's still part of the larger space [the park] but it doesn't have to be partitioned like I see the signage and I go in.

Participants also highlighted the imposing tonality of the text-heavy signage where information was more technical than user-friendly. In addition, participants at Sembawang Park's therapeutic garden also brought up the labelling of 'active' and 'passive' zones as inaccurate and didactic. According to them, it seemed odd that exercise equipments were placed within the 'passive' zone. See **Figure 6** that showed examples of signages.

All said, rather than prescribing exact ways to interact in the garden, many participants were open to receiving suggestions. For instance, the approach of "show, don't tell" was viewed favourably as it expanded rather than restricted the possible ways to experience the garden.

Figure 5

Participants' photos that showed wilted plants, overgrown grass and foot reflexology textured pathway

Figure 6

Participants' photos that showed text-heavy signages and technical language

3.2 Being in the moment

3.2.1 Mindful activities that helped participants relax and be more in tune with nature

Participants shared that the breathing exercise and photo-taking task helped them become more observant and present. Specifically, participants felt that the breathing exercise calmed them, emptied their minds and put them in the right frame of mind to better connect with nature. Some participants felt comfortable closing their eyes, while others kept their gaze straight ahead or upward. Similarly, some were able to get into the breathing exercise relatively easy but others struggled to focus due to noise, distractions from footsteps, and concerns about safety. Linda shared that she felt tired upon arriving at the garden, but after the breathing exercise, she felt "a lot more relaxed" and "slightly more awake." Kelvin also described how he felt after the breathing exercise:

> I felt lighter which is surprising because I only took 10 breaths….And, also I had to drive 35 minutes to come over here before taking the walk, probably that [breathing exercise] in certain way help to reset. And, doing the breathing exercise before taking the walk proper also calmed me.

Like the breathing exercise, the task of taking photographs also helped participants to actively notice and connect with the environment. For most

participants, the idea of taking photographs with their mobile devices did not distract from their overall experience. Alan felt more mindful, noting that taking photographs "made me more aware of the garden features and elements." Linda also mentioned this heightened awareness:

> I think it made me a bit more conscious. Felt like Dora the Explorer. I think just got me a bit more conscious in terms of observation. It didn't hinder but maybe just enhanced it even. Coz it [photo taking] makes me conscious…knowing the space, so I feel more relaxed.

Two participants chose to take the photos only after completing the stroll. Like the others, they did not mind the photo-taking task. Another participant shared that, although it was not a distraction, he would prefer to put aside the digital device and simply "live in that moment" if not for the task.

3.2.2 Feeling immersed in the garden: sight, sound, texture

Throughout the interviews, participants talked extensively about what they saw, what they heard, what they touched and how these interactions affected how they feel and react. Compared to sight, sound and touch, smell was not as apparent for most participants. Between man-made and natural sounds, most participants preferred the latter.

Having said that, perception of the environment is likely to involve multiple sensory modalities. The combination of a nice visual and pleasant sound amplified the experience for Alan who highlighted the role of plants and insects when choosing a particular site for his breathing exercise. According to Alan, "the environment was a bit helpful because you see the plants then you hear the insect noises, you feel a bit more relaxed and in tune with nature."

Other participants mentioned about garden features and elements such as the sights of wildlife, large-leafed plants and the sounds of rustling leaves, chirping birds and crickets. These aspects combined to provide the much-needed distractions from thoughts about work or deadlines. This detachment from work and other pressing matters created an opportunity to slow down, stay present and soak in the garden experience. In other words, participants were able to direct their attention to their immediate surroundings and stay in the here and now. For example, many shared about being transfixed by the serendipitous encounter with wildlife such as butterflies and chickens. The unusual sighting of a great number of butterflies in one setting captivated most of the participants and momentarily distracted them from thinking about anything. Enraptured by the sight of

butterflies, Harry revealed that it was “a moment of wonder” and something novel for him. He shared that what he saw was “something that's so different from everyday life. Like you wouldn't see it in the offices or homes.”

Although Linda, who had a fear of butterflies, did not react favourably to seeing so many of them, she shared that the lush greenery, the sounds of crickets and birds in the trees, and the sight of “a little cute statue [a wooden bird carving]” made her smiled while she was seated on the bench. She recalled feeling immersed and happy at that moment. Such moments of serendipity were also echoed by Kevin who was mesmerised by the sight of ants. He elaborated on what drew him to the ants: “I saw the red ants in the garden and I stood and watched for a while as they used the leaves to form the nest.”

Florence also shared about how she was intrigued by the many holes that were likely left by caterpillars feeding on leaves. See **Figure 7** which showed photos of ants and leaves with holes taken by Kevin and Florence respectively.

For a few participants, visuals of familiar settings or objects conjured up positive imagery from the past. Kevin shared that big leaves piqued his interest, and reignited his childhood curiosity of “not [being] afraid to touch things.” He further elaborated that the surprise element of what he saw [the leaves] against how they felt, could be another driving factor for wanting to touch the different textured leaves. For Alan, characteristics of playspaces such as the Beads Maze briefly transported him to a time when he was a kid. He reminisced about his childhood days, playing with similar kinds of toys like the wooden beads in the garden. Conversely, man-made features such as black lamps, metal railing, construction cone, signages and fitness equipment that were in stark contrast to the natural setting were highlighted by a few participants as intrusive. It was possible that these objects reminded them too much about city life.

Visual aside, sounds from nature also acted as positive distractions, filtering out unpleasant noises. At Sun Plaza Park, four participants did not hear the sound of trains from the nearby tracks. As articulated by Joseph: “I didn’t notice it. So I think that was quite nice. I think your senses are kind of diverted to other things [in nature].” Similar to the unwelcome sight of man-made features, sounds from people chatting, footsteps, loud music and passing vehicles were deemed disturbing. Alan likened that sounds from the main roads were distracting in a negative way. He felt that traffic sounds “clashed with the whole nature vibes” and seemed “out of place.”

Figure 7

Example of participants' photos which held their interest and attention

Note. Left: ants forming nests with leaves. Right: leaves with holes left by caterpillars.

3.3 Solitude and away from people

Participants mentioned repeatedly about the importance of disconnecting from work life and disengaging from people. Many expressed appreciation for a place that is relatively quiet and peaceful, where they could unplug, unwind and recover. A few shared that the garden stroll provided an opportunity for them to get away from a hectic work environment, crowded places and people, including the cacophony of noises from busy streetscapes. However, in some spaces within the garden, the presence of people or their footsteps would "break the illusion of [the garden] as a sanctuary," said Kevin. Alan believed that with people around, one might be discouraged to interact more freely with the content for fear of judgement.

Solitude could mean being alone or with people, so long as the latter did not interfere with the process of finding peace and quiet. Florence clarified that the desire to be alone did not imply that she was uncomfortable with people. On the contrary, she acknowledged that she felt at ease when she saw an older gentleman at the shelter area: they exchanged smiles without the need to speak to each other. Michael shared that he was fine with fellow visitors sharing the spaces with him, so long as there was the mutual understanding that they were in the garden with similar agenda, which is to relax and not be disturbed. However, he added that the same principle might not apply to loud teenagers or children as he believed they might disrupt the serenity and quietness of the garden.

Finally, time spent in solitude could heighten one's awareness of the environment and promote introspection. This sub-theme was exemplified through the sharing by Florence who noticed the "(sun) rays peeping through," "leaves rustling," and was momentarily transfixed by the moving clouds which made her think that "you are just…a speck of dust, kind of like going through life. Like you appreciate the vastness of everything."

3.4 Feeling calm and energised

Feeling calm and energised at the same time seemed to be an appealing proposition for the participants. Many participants talked about feeling peaceful, relaxed and calmed when they were in the garden. Such emotions were typically associated with sights and sounds in the garden like a wide array of colourful plants and flowers, sightings of butterflies, chickens, tall wispy plants and sounds of insects and birds. See **Figure 8** which showed examples of calming features in the garden. In addition, gazing into the sky while surrounded by tall trees evoked a sense of calmness which Linda described as "spacing out" and feeling safe. Like Linda, Florence also experienced moments of peace when looking up at the vast sky; her mind felt empty, and she sensed a light breeze rustling the leaves. She briefly spotted a large grey bird amidst the moving clouds, feeling both calm and humbled. Many participants also mentioned that water offered a sense of calm and relaxation. Both Michael and Harry chose the Calming Corner with the mini water feature for their breathing exercises and reported feeling more relaxed afterward.

Furthermore, this state of calmness appeared to ignite creativity as highlighted by two participants. Kevin shared his experience of exercising in a nearby park close to his home, where he would often "lie down, look at the trees, look at the sky, and then just think, and in between sets of exercise, sometimes an idea comes to mind." He added that it would be ideal if this garden could be combined with his exercise space. Joseph also noted that the place where he found inspiration for his music was "kind of similar to this [place]. I like that it has no expectation, like you just walk in. Typically, those kinds of moments are when you can come up with ideas easily, creatively."

Linda said that she felt like *"Dora the Explorer"* (from the children's TV series) where she rearranged the beads at the Beads Maze structure and tried her hand at striking different notes with the musical contraption. In addition, she shared that she was feeling quite sleepy after work but felt less tired and more refreshed after the garden stroll. Many participants also exhibited curiosity and exuberance when sharing photos of wildlife they had captured. A few participants

at the Sun Plaza therapeutic garden shared about the experience of touching the leaves with different textures, the chanced encounter with wildlife and how "time went by quickly" while they were exploring. Refer to **Figure 9** for participants' photographs showcasing large textured leaves and wildlife.

For Harry, the relaxation and exploration aspects of being in the garden seemed to complement each other. He explained that the act of exploring allowed him to relax by shifting his focus away from work-related concerns.

Many also interacted with objects in the play spaces such as the musical contraption, beads at the Beads Maze and wooden stumps at the Natural Playspaces. In many instances, albeit not explicitly spoken, the quality of playfulness was evident in how they interacted with the play structures: rearranging the beads, experimenting with musical contraption and hopping on wooden stumps. See **Figure 10** for participants' photos of the three play structures.

Figure 8

Example of participants' photos that showed the calming features in the gardens

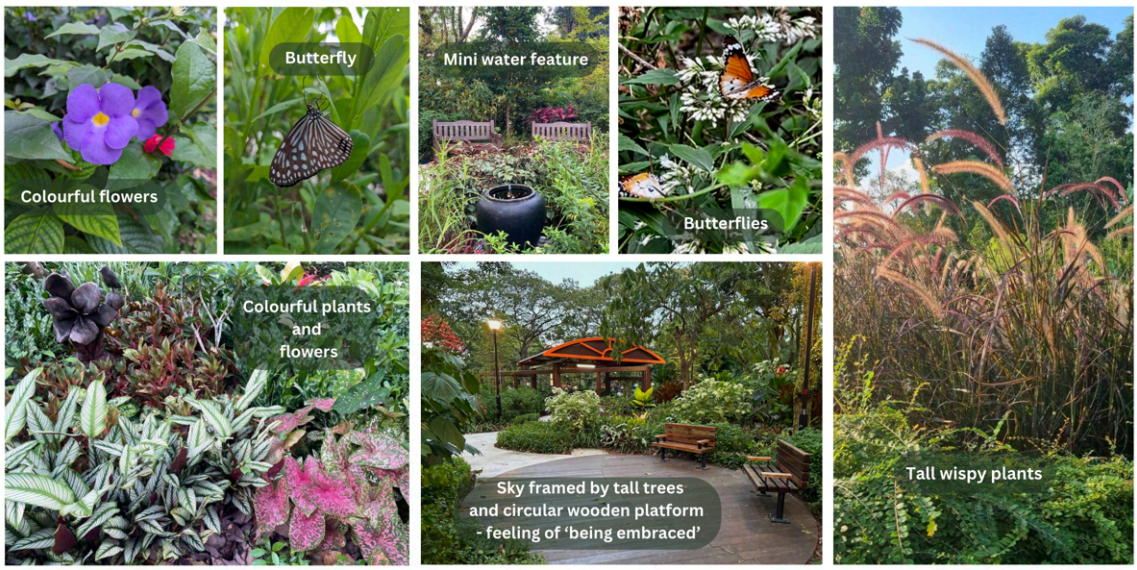


Figure 9

Example of participants' photos that showed textured leaves and wildlife

Figure 10

Examples of participants' photos showing play structures which they interacted

Note. Left: musical contraption. Top right: Beads Maze. Bottom right: wooden stumps at Nature Playscape.

3.5 Size matters but so are safety, serenity and openness

One participant expressed the belief that “the [larger garden] size will certainly contribute to more things to explore, more things to be curious about.” Another participant perceived a sense of spaciousness and described how the garden seemed “larger than it looked” and was packed “full of surprises.”

The perception of safety and threat was influenced by whether a space was enclosed or open. In an enclosed space with obstructed views, participants had limited or no sight of the comings and goings of people or wildlife. Conversely, an open space with a clear depth of view (prospect) of seeing who or what was approaching provided a greater sense of security. Similarly, dense vegetation made individuals feel constricted and partially enclosed. Harry experienced such sensation, expressing that “the greenery intrudes on the pathway. I feel cramped and claustrophobic.”

Granted, an open space tends to evoke a sense of expansiveness and possibilities when considering the type of view and range it affords. That’s not to say that a relatively enclosed space restricts visual access. In fact, Linda shared that while seated on the bench, she did not focus at eye level. Instead, she looked up and noticed the trees “formed a nice opening to the sky.” She also mentioned observing the white trail left by a passing airplane and hearing birds in the trees while practising deep breathing. These elements contributed to her sense of space, providing a calming and surprisingly awakening experience. Florence, another participant noted that although the trees partially covered the sky, they did not completely obstruct it. She described observing a “pretty big" grey bird, hearing the rustling of leaves and seeing clouds move, which made her “appreciate the vastness of everything." Despite being in a relatively small garden with limited sight of what’s in front of them, both participants were able to gaze up at the sky, expanding their visual access beyond the confines of the garden. See **Figure 11** that showed two photos taken by Linda and Florence respectively: a photo captured the framing of trees and cloud trail, and another photo illustrated the view of looking up at the sky.

In scenarios where serenity was preferred, open spaces tend to be less effective in buffering sound pollution from the main roads. Spaces that were near entrances or exits, were deemed as too open, with higher foot or vehicular traffic. According to Joseph, the discernible noise from the outside was a reminder of city life and in that respect, you could not totally distance yourself from the hustle and bustle that was going on beyond the garden. Likewise, when practising deep breathing, four out of the eight participants cited that many areas within the garden were “too

exposed" or "too open." For them, a less exposed space with minimal interference where they could feel safe, tune out the unwanted noises and get into the state of relaxation, was preferred. See **Figure 12** which showed two photos of areas exposed to unwanted noises: a photo taken by a participant to illustrate a part of the garden that was exposed to vehicular traffic, and a photo which showed an entrance/exit that was right beside a dog run area.

In short, enclosed space affected perceived safety and threats and could also feel cluttered. However, visual access was not limited to open spaces; a relatively enclosed space could also provide visual access. When it comes to serenity, an open space was less effective in filtering out unwanted noises. Hence, activities such as the breathing exercise was better suited in a space that was relatively enclosed but not as exposed to outside interference.

Figure 11

Participants' photos that showed visual access

Note. Left: framing of trees and cloud trail left by a passing airplane. Right: the view when she gazed up at the sky.

Figure 12

Participants' photos of areas exposed to outside noises

Note. Left: vehicular traffic seen from Garden Nook trail (Sun Plaza Park). Right: entrance/exit of Butterfly Garden situated next to dog run area (Sembawang Park).

4. Discussion

To recap, this study aimed to explore how working professionals experienced a self-guided garden stroll, which included a deep breathing exercise and a photo -taking task which participants would undertake to capture both positive and negative aspects of the garden. In addition, the study sought to identify elements in the garden that contribute or hinder the restorative potential. By examining the experiences of eight working individuals, this study offered insights into their daily lives. Their sharing and reflections illuminated their garden experiences and provided an opportunity to investigate how the garden could serve as a resource for recovery from stressful workdays or demanding work environments.

Overall, the results revealed that convenience is important for time-poor working adults. Hence, location of the garden and its proximity to home or workplace is likely to make the difference. Besides location, the inclusion of mindful activities seemed to hold great potential in facilitating awareness and enhancing the overall garden experience. For it to be a place of respite, managing disturbances and unwanted noise also appeared to be crucial. Having said that, many participants did not shun away from interacting with features or elements that amplified their excitement. In other words, playfulness may be a way for working professionals to release tension and destress. Additionally, before realising the garden's full potential, a less directive approach of information dissemination may expand ways to experience the garden. However, when it comes to maintenance of the garden, more involvement is required - an unkempt garden tend to signify a state of disorderly and lack of care which goes against the uplifting aspects of being in nature.

4.1 Restorative environments for the time-poor

Referring back to Kaplan's Attention Restoration Theory (1989), both the gardens afforded the quality of 'being away' by offering working individuals an escape from an often mundane, built indoor environments to an outdoor sensory rich environment with natural light. Sounds and movement of insects such as butterflies and ants; sighting of wildlife like chickens and birds, as well as plants with different textures and colours can contribute to moments of fascination that do not necessitate much effort. Coupled with trees framing the view of the vast sky, this sense of boundlessness is likely to invite stillness and quiet self-reflection. In essence, the qualities and characteristics of the gardens are very much consistent with the restorative components in Kaplan's theory. However, the

quality of compatibility is debatable. Working professionals lead a busy lifestyle and many may not have the luxury of time to visit the garden. Based on a study that investigated restorative environments across lifespan, different life stages seemed to affect the relative importance placed on each of the four components, including the time available for restoration (Scopelliti & Giuliani, 2004). Knowing that our target group are time-strapped individuals, the restorative potential of the garden may diminish if the garden is not easily accessible or fit well with their busy schedules. The fact that the gardens under investigation are not in close proximity to where they live or work could pose a challenge. Therefore, situating such gardens in parks that are within walking distance of local neighborhoods or workplaces is important. This is in line with what Kaplan and Kaplan (1992) described as "nearby nature," where green spaces such as parks and gardens are within the immediate vicinity of daily lives and integrated into everyday settings. After all, studies have shown that even brief contact with nature can result in positive affect (McMahan & Estes, 2015). It is also believed that restorative responses that followed after nature exposure happened rather instantaneously, and typically within minutes rather than hours (Ulrich, 1999). The results from the self-report valence-activation affective scale appeared to mirror the notion that a brief garden stroll could effect a positive change in the emotional states of working professionals. For instance, the pre-stroll affective state of *tired, sleepy, dull* that was first indicated by three participants shifted towards *attentive, awake, alert* after the garden stroll. All said, a short garden stroll in the neighbourhood therapeutic garden may just be what busy working professionals need after a long day at work.

4.2 Enhancing the garden experience through mindful activity

The findings demonstrated that mindful interventions such as the breathing exercise and photo-taking task can help participants notice and be more present. For the most part, participants found that doing the breathing exercise before the stroll helped to calm them and put them in the right mindset. This present-moment awareness is in line with previous studies that deployed a more intensive engagement intervention. One such study utilised a two-week engagement intervention to compare participants who were assigned cognitive awareness and engagement plans while taking walks outdoors against a control group with only a walking schedule (Duvall, 2011). Participants in the engagement group received plans that helped them take on a more active role such as learning how to activate their senses or adopt a more "playful and curious orientation" like taking on an

imaginary role of an artist in the lookout for inspiration in the garden. The group with the awareness plans showed an improvement in psychological well-being and rated the walks more positively.

Same can be said about the photo-elicitation task which is another way to encourage participants to adopt the role of active explorers, actively seeking content for sharing during the interview. Many participants believed that the task forces them to be more aware and to pay closer attention to what's around them. This exhibited sense of mindfulness could potentially enhance the restorative experiences as demonstrated by a study conducted by Lin and colleagues (2014) where participants were placed into four groups and shown the following: streetscapes with no trees; streetscapes with minimal trees; streetscapes with trees; streetscapes with trees where participants were specifically told to pay attention. The fourth group with raised awareness of the trees fared best in attentional test and also rated streetscapes as more restorative.

In short, mindful activities that are easily integrated as part of a self-guided stroll can be of value in bringing about awareness that contributes to a more positive and richer experience.

4.3 A place of respite with no disturbances

Finding a way to briefly escape from the overwhelming demands and pressures of an always-on lifestyle seemed to be high on the list of priorities for working professionals. Participants expressed the desire for solitude due to their daily experiences with traffic, crowded spaces and pressing work deadlines.

According to a study on restorative environments across different age groups, the restorative aspect of being-away is deemed to be of greater importance to young people and adults than older individuals (Scopelliti & Giuliani, 2004). Even though the garden offered some form of respite from the busy and stressful city life, any remnants of urban activity, such as traffic noise, serve as unwelcome reminders of the very stressors they are attempting to escape. Consequently, the sense of serenity is compromised by disturbances caused by foot and vehicular traffic - both from nearby roads and within the park itself. Previous research has also highlighted noise intrusion as a sensory distraction that undermines the serenity of the environment. For example, a study that explored the characteristics of forest therapy trails identified noise intrusion as a primary sensory distraction (Gobster et al., 2023). One possible solution is to incorporate a water feature, as the sound of flowing water has been shown to promote peace and tranquillity

(Pálsdóttir et al., 2014), and can help mask unwanted urban noise (Jeon et al., 2010).

In addition, more can be done to provide spaces that strike a balance of openness and enclosure. This is encapsulated in Appleton's (1996) prospect-refuge theory which states that as part of our survival instinct, humans have the psychological need for places that allow both a vantage view and refuge of not being seen. Spaces such as the circular area with two benches and the wooden stool at Beads Maze came close to finding this balance but noise interference is still a challenge. In short, mitigating the negative effects of urban noises is crucial for the garden to be considered as a place for respite.

4.4. Therapeutic gardens with play value for young professionals

As shown by the results from the study, young professionals appeared to exhibit the quality of playfulness while interacting with various playspaces in the gardens. In considering environments that support restoration, settings that offer opportunities for play and exploration are no less crucial but often overlooked. In fact, emotions such as excitement that is considered a high arousal state is often deemed to be less conducive as a restorative outcome. This is reflected in a UK study, which utilised the Circumflex Model of Affect to appraise the relationship between aesthetic preference, biodiversity and restorative value of urban planting. Specifically, it was indicated that a restorative effect was likely to occur in an environment that could elicit affective responses with positive valence and low arousal (Harries et al., 2024). Simply put, stimuli that could evoke a calm and relaxed state of emotions are considered most conducive for restorative outcomes. To some extent, this finding from the UK study is consistent with what was shared about the choice of spot for the breathing exercise. Participants tend to choose areas that were more subdued and less stimulating with minimal arousal in order to be in a calmer and relaxed state of mind. However, a stimulating environment which facilities play such as the moving of beads, striking notes on the musical contraption and "hopping up and down the wooden logs" can distract the mind from everyday worries. This aligns with the idea of a restorative outcome resulting from positive distractions. It is consistent with Ulrich's (1991) Theory of Supportive Design which highlights that play and exploratory activities can act as "positive distractions" from the routines of daily life. These emotions that are associated with play are typically categorised as high arousal and positive valence. In other words, this emotional response of positive valence and high arousal challenges the notion that a calm and relaxed state alone dictates the level

of restorative benefits. On the contrary, positive valence and high arousal state did not seem to undermine the mental recovery process.

In a qualitative study that explored the importance of play for adults, playfulness was construed as a way to manage stress and "to let off steam" (Lubbers et al., 2023). At the same time, the study also acknowledged that the value of play for adults remains not as well understood compared to existing research that focuses on play and early children development. The correlation between playfulness and restoration is indeed not so clear-cut. It is also plausible that the degree of arousal that is relevant for young professionals differ from low arousal restoration that are typically helpful for older individuals or people who are emotionally vulnerable.

Connected to this topic is the participants' fascination with rearranging wooden beads crafted from recycled timber. Perhaps, there is a child in all of us, an inclination toward playfulness. Drawing from studies on natural environments as playscapes for children, loose materials such as sticks and leaves often provide a more dynamic play setting that fosters imaginative and constructive play (Fjørtoft, 2001; Prins et al., 2022). Furthermore, many participants expressed a preference for natural materials that harmonise with the surrounding environment. Interestingly, the use of natural materials for play has also been observed in previous research on children's play areas (Fjørtoft & Sageie, 2000; Pysander et al., 2024).

Moreover, engaging in physical activities like dog walking, running and exercising in parks appeared to have demonstrated effectiveness in keeping participants active. Hence, it could be valuable to investigate how these activities can complement features within the garden. After all, numerous studies have shown that green exercise, which refers to physical activity in green environments, supports mental health (e.g., Bowler et al., 2010; Gladwell et al., 2013).

Another intriguing aspect concerns the relationship between exposure to nature and creativity. Research has indicated the potential for enhancing problem-solving creativity among participants who underwent a four-day hike (Atchley et al., 2012), as well as interest generating aspects of nature experiences that support creativity (Ratcliffe et al., 2022). Additionally, insights from creative professionals who view nature as a supportive influence in their creative pursuits and idea generation have also been documented (Williams et al., 2018). While this study does not extensively investigate this area, the exploration of how nature could potentially enhance the creativity of professionals in future research holds promise.

In summary, what are deemed to be young professionals-friendly may vary from older adults. When integrated with play and green exercise, the garden serves not only as a break from work but also the potential to be a space to foster playfulness, and enhance creative productivity in the workplace.

4.5 A tidy garden with room for exploration

Signage plays an important role in creating a positive experience in the garden. As highlighted by Kaplan & Kaplan (1998) in the book *'With people in mind,'* a map or signage serves to orientate and provide information that is easy to understand and cater to the needs of the user. Similarly, simplicity of messaging was mentioned as one of the factors that can affect the effectiveness of signages (Gobster et al., 2023). In today's information-overload environment, it is not surprising that signages at the garden are often ignored and on occasion where they are read, many expressed that the signages contain too much text and that the information is not entirely relevant or helpful. Likewise, the use of language such as 'evidenced-based approach and research' is probably not useful for an individual who is trying to relax and declutter the mind. In order to increase the likelihood of these signages being read and used effectively, clarity and simplicity of information are crucial. Equally important is the use of a non-prescriptive tone and approach in conveying information. This need for autonomy is reflected in Ulrich's (1991) Theory of Supportive Design, which stated that environments that are designed to strengthen personal control may aid in stress coping and restoration. Rather than focusing on a set of pre-defined outcomes, it might be good to provide a few pointers to pique interest and leave room for exploration.

Likewise, the lack of maintenance that resulted in wilted or dying plants goes against the image of recovery or rejuvenation. Same applied to overgrown grass and the lack of cleanliness at the foot reflexology pathways. As reflected in a study by Martens and colleagues (2011) which compared a walk in a wild forest against a tended urban forest, the latter showed a stronger improvement in positive affect and a stronger decrease in negative affect than participants in the wild forest walk. The study attributed that one possibility for the negative affect could be the presence of "deadwood" in the forest that conjured up images of sadness. Another possible explanation could be signs of care and maintenance boosted perceived safety while dense forest was associated with perceived threat (Martens et al., 2011).

In short, a less directive approach of information dissemination to encourage self-discovery, accompanied by a proactive maintenance schedule to ensure a thriving and orderly garden may improve the overall restorative potential.

5. Implications and Limitations

Despite the small sample size, which does not represent the general population, the study provided valuable insights into how working professionals perceive and experience the therapeutic garden. While participants' garden experiences and preferences were subjective and varied, this study marks an initial step toward exploring the potential to broaden the garden's user base to include this demographic. As action research is not permitted in this master's program, careful planning was given to the methodology and selection of viable interventions. Future studies can incorporate proposed improvements and engagement ideas identified in this research. Additionally, beyond self-reported affective measure, future studies could include physiological and cognitive assessments. Control groups could also be used to evaluate the effects of different intervention variables.

These findings may also benefit organisations looking to incorporate outdoor green spaces into their employee wellbeing programs. Similarly, further studies could assess the awareness, usage patterns or lack thereof among people working near a therapeutic garden, such as the one at Hort Park, which is just a short distance from many offices and businesses.

Activities such as the breathing exercise and photo-taking were very well received. Many participants reported that the breathing exercise before the stroll helped them relax and get them into the right mindset. The initial concern about using digital devices for the photo-taking task in the garden proved to be unfounded. Instead, participants found that taking photographs heightened their environmental awareness and helped them notice more details. For most participants, using a mobile device was not a distraction. A few preferred to complete the photo-taking task towards the end of their stroll to remain fully present in the garden.

Practical constraints such as a single student researcher, limited the scope and duration of the study. Other factors that may affect the garden experience such as time of day and presence of mosquitoes were considered before the commencement of the study. Since natural light and brightness can impact the perceived restorative qualities of the environment (Menado et al., 2019), evening strolls were conducted between 1700hrs and 1800hrs to ensure optimal daylight.

Likewise, insect repellent was offered to participants, though a few opted not to use it. There were proportionately more males than females, but gender did not appear to influence the experience. It is noteworthy that the initial plan to include existing park users was thwarted because most visitors were unavailable to stay for the additional time required for interviews. Similarly, the option to schedule interviews for a future date and time was not well received.

6. Conclusion

Drawing inspiration from Rachel and Stephen Kaplan's book (1998) on designing people-centric everyday nature, this study is a modest attempt to explore additional ways a garden - originally designed for the elderly and later expanded to include families - can be utilised to meet the needs of working individuals. Even though the study is not intended to provide conclusive results, it is hoped that the findings will bring us closer to understanding how other natural settings and resources can be adapted to offer restoration and support for working professionals.

As it stands, working professionals spend a significant amount of their waking hours indoors. From this perspective, any opportunity to get them outdoors, even a stroll in a relatively small garden, is worth considering. These gardens have the potential to serve as effective spaces for recovery from daily stress and tension, and they can provide play opportunities that enhance creativity. To evaluate their restorative potential, the combined makeup of various garden components must be taken into account. Engagement strategies such as sensory activation cues and mindfulness practices can be implemented to enrich the experience of a self-guided stroll. However, simply raising awareness about therapeutic gardens is not sufficient to encourage trial or sustained usage. Easy access is key to ensure the garden becomes a viable resource for working professionals who live nearby or work in the vicinity of the park.

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Appendix - Interview Guide

Garden Experience

Hi, can you indicate for me how you feel now that you have completed the walk? (Use the emoji sheet)…Tell me more about this feeling.

(Lay out the printed garden map for ease of sharing the walking path and places of interest/disinterest)

Show me where you walk and how you feel as you were strolling in the garden.

(If sensory related elements are not mentioned in the overall garden experience, probe to find out if the senses are activated)

Anything about the plants, flowers, vegetation or animals, birds if any, in the garden which you would like to talk about? What else did you notice?

Task-specified Experience

Can you show me the photo of where you have chosen to do the breathing exercise? Tell me more about the place or the spot you have chosen. Were you sitting or lying down? How did you feel when you were sitting or lying down and breathing deeply? Share with me more about this feeling.

Was it easy or difficult for you to do so? *Probe what makes it the ideal spot for this exercise.* Were there specific elements, features or details in this area that made it suitable to practice the exercise? Tell me more about them.

Let's look at the other photos that you had taken. First, share with me the set of photos with places, features or elements that you find particularly beneficial for you. In other words, places in the garden that make you smile, make you curious or capture your attention/draw you in. *Go through each photo with the participant*. How did you feel when you took this photo? What ran through your mind? What about the place? What about the features or elements? Could you share with me more about… *(ask participant to elaborate on the emotions: happy/ relaxed/smile/curious etc).*

Imagine you had a long day at work today or that you have worked very hard on a project for a while now and feeling drained. Would taking a stroll in this garden benefit you in any way? How so?)

And, is there anything in the garden that you dislike or you feel is not beneficial for you? Would you have any photos to illustrate? *Go through the photos with the participant.* Could you tell me more about these photos? What about the place? What about the features or elements? What changes would you like to see? If you

came here after a long day at work, how can a place help you to relax, to recover, and to recharge? What else would you like to see or experience?

How about a handout or recommendations that explicitly show or guide you on what to do while at the garden? Anything else?

Work Environment

Thank you for such great insights! Let's move on to your work environment.

Take me through a typical work day. What are your working hours? How do you feel after the end of day? What do you do after work? *(If participant cited stressful work day, probe about what and how he/she does to feel better i.e. what would it take to get him/her to feel better)*

General Questions

Lastly, there is no right or wrong answer. What comes to mind when you think about restorative gardens? *Perhaps, this is where I can also clarify on the term 'therapeutic garden' as labeled by National Parks Singapore.*

(If participant finds it difficult to describe components/qualities of what constitutes a restorative setting or environment, proceed with the following questions) Name three key words that would describe your ideal space or activity that helps you de-stress, recover or recharge from a stressful workday or workweek (to ascertain restorative potential of the setting/activities)

(If this is not obvious from the earlier conversation) Would you come back here again? Share with me what about this garden that makes you say so.

This concludes the interview. I am grateful for your participation and sharing. Again, pls feel free to reach out to me should any questions pop up after this. Also, I'll be happy to share a copy of my final thesis with you if you are interested to read more about it.