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Seeds for Thought A Letter From the Editor

Elizabeth R. Messer Diehl, ASLA, HTM

One of the reasons I love living in Florida is that I can garden and take walks outside year-round. There are many other states whose residents can benefit from nature and sunshine year-round; in fact, it's been reported that only 1% of those living in Florida suffer from seasonal affective disorder while almost 10% of those in New Hampshire suffer from it. Statistics on seasonal affective disorder reveal that the amount of cases reported is much higher in the northern hemisphere. The more north, the more common the disorder is; most likely as a result of the progressively shorter winter days.

What is seasonal affective disorder (SAD)? People with SAD develop symptoms of depression in the winter months when there is less daylight. Symptoms include difficulty concentrating, low energy, fatigue, loss of interest in daily activities, moodiness, and sleeping excessive amounts. Six out of every 100 people may experience SAD while another 10-20% may experience a mild form of it. Women seem to experience it more than men - as much as four times more often. SAD commonly shows up after age 20 and usually decreases as adults age, and there appears to be a genetic component as well. Certainly the length of the day and the amount of sunshine available is the main factor in SAD, but it is compounded by the cold – if it is too cold to spend time outside comfortably than you are much less likely to benefit from any sunshine that exists.

And how does sunshine affect your mood? Mood is influenced by a complex relationship between sunlight, melatonin (the sleep hormone), and serotonin (the hormone associated with wakefulness and elevated mood). As darkness falls, your melatonin levels naturally increase.

And as the morning light emerges, melatonin levels decrease. The levels of serotonin, which is considered a natural antidepressant, increase when you're exposed to bright light – that's why moods tend to be more elevated during the summer. The higher the serotonin levels in your bloodstream, the higher your mood and energy levels. Studies have shown that the brain produces more serotonin on sunny days than on darker days. And to add to that, research has found a relationship between sunlight exposure and cognitive function, with lower levels of sunlight associated with impaired cognitive status.

So what's the solution to the lack of available sunlight? Light therapy is one of the main ways to combat SAD and it is often prescribed for 30 minutes a day. You can buy a special light box to use every day, and if you have severe symptoms of SAD that may be necessary and sometimes in combination with antidepressants. But if your symptoms are mild then you might greatly benefit from regular visits to a facility like a botanical greenhouse or atrium space.

And if that doesn't convince you, consider this: a Columbia University study found that high-flow negative ions had positive effects on mood. Where do you find such ions? Forests, the shore, and humid environments like greenhouses. Perhaps that's another reason that SAD is relatively non-existent in humid Florida.

If you are lucky enough to work at a facility that has a greenhouse space then you probably don't find yourself suffering from SAD and perhaps your clients don't either. In our work we often focus on the interaction with plants, soil, and fresh air, but safe exposure to sunlight is important as well. I can't think of a better place to take my light therapy on a sunny day in the middle of the winter than a greenhouse, planted atrium, or bright light cart loaded with plants, especially one accompanied by a horticultural therapy practitioner.

Happy winter!

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The Effect of Horticultural Activity on the Cognitive Performance of Healthy Elderly Individuals

Haruyuki Kojima and Mitsunobu Kunimi

The cognitive performance of healthy elderly people was examined before and after participating in horticultural activities for three months. Subjects engaged in indoor and outdoor horticultural activities, woodworking activities at a desk, group conversation, and lunch and tea breaks, which lasted a total of three to four hours. Cognitive performance was evaluated using the following tests: 1) numeral retention (digit-span test); 2) copying numbers or signs (coding test); and 3) single-digit arithmetic (arithmetic test). Following these activities, the memory capacity and operability in the digit-span test remained unchanged. However, coding performance slightly increased in the experimental group, and arithmetic performance significantly increased. The results suggest that activities including horticulture, conversation, and/or creative work contribute to improving cognitive functioning in elderly people. Further examination revealed that the performance gain occurred in the verbal memory-motor system, which is generally understood as the phonological loop in the working memory. The dynamics and susceptibility of cognitive processes in elderly people are discussed in relation to the working memory model and other related factors.

INTRODUCTION

Memory loss is one of the most frequent complaints of elderly people. Researchers have investigated what types of memory decline during the aging process and the way in which memory performance changes (Craik & Bialystok, 2006; Li, Lindenberger, & Sikström, 2001). Age-related memory declines in healthy elderly individuals and individuals with dementia, Alzheimer's disease, and mild cognitive impairment (DSM-IV-TR, 2002) have been extensively investigated in various fields of research (e.g., Baddeley, Logie, Bressi, Della Sala, & Spinnler, 1986; Jalbert, Daiello, & Lapane, 2008; Rapoport, 2000; Whitehouse et al., 1982).

Memory loss has often been discussed in relation to the working memory (WM) model (Baddeley & Hitch, 1974; Baddeley, 2000; 2003), which provides a general model of cognitive performance. The WM model typically involves the central executive (CE) and its two slave systems, phonological loop (PL) and visuo-spatial sketchpad (VS), where PL temporally stores verbal information and VS stores visual image information. Then, the central executive processes cognitive tasks using the information of the phonological loop and/or the visuo-spatial sketchpad. A series of studies have revealed that the capacity of the phonological loop declines with age (Buckner, 2004; Collette, Van der Linden, Bechet, & Salmon, 1999; Van der Linden, Bredart, & Beerten, 1994; Wingfield, Stine, Lahar, & Aberdeen, 1988). Many studies have also investigated the properties of memory and cognitive functions, comparing elderly and young subjects (Baddeley et al., 1986; Perkinson, Lindholm, & Urell, 1980; Van der Linden et al., 1994). For example, Belleville, Rouleau, and Caza (1998) showed that elderly subjects were not impaired relative to young control subjects in manipulating information such as recalling random words in alphabetical order but did perform worse on divided attention tasks. These results suggested that the memory impairment of the elderly was associated with the functioning of the central executive in the working memory model.

Ball et al. (2002) examined whether cognitive training interventions such as speed, reasoning, or memory training improved mental abilities and daily functioning in older adults, and then showed that the trainings were effective and durable with respect to these cognitive abilities. Recent psychological, neurological, and pathological studies further suggest that even in

older adults, the cognitive performance associated with working memory can be maintained or even re-trained and enhanced by appropriate exercise. For example, Colombe and Kramer (2003) conducted a meta-analysis of 18 studies to determine whether aerobic fitness training enhances the cognitive vitality of older adults. Fitness training was found to provide robust but selective benefits, especially for executive control processes. Heyn, Abreu, and Ottenbacher (2004) also performed a meta-analysis with a total of 2020 subjects participating in 30 trials that met the criteria of the study. They concluded that exercise training increases fitness, physical function, cognitive function, and positive behavior in people with dementia and related cognitive impairments. Kramer, Erickson, and Colombe (2006) reviewed the literature on the effects of exercise on the brain and cognition and highlighted the positive effects of exercise on the aging brain in clinical populations. Williamson et al. (2009) found that the cognitive score of older adults, specifically the digit-symbol substitution test score, was significantly correlated with the Short Physical Performance Battery score. Based on these results, they discussed the benefits of exercise on cognitive function in older adults.

Both physical and cognitive training improve cognitive functioning. Craik et al. (2007) provided information about the nature of memory and how to improve performance. Their results showed no training-related improvement in working memory but provided some exploratory evidence of a training benefit in recognition memory and strategic processing. Li et al. (2008) found that deliberate working memory practice in old age merits further exploration for its effects on cognitive plasticity. Furthermore, Richmond, Morrison, Chein, and Olson (2011) demonstrated that working memory training improved cognitive functioning as observed by reading span and verbal learning.

Conversely, lower physical performance is associated with an increased risk of dementia (Wang, Larson, Bowen, & van Belle, 2006). Nevertheless, it is not well known whether a certain type of exercise is necessary or whether mild daily activity is sufficient to maintain cognitive performance in elderly people, and if so, which cognitive function can be maintained by the activity. Horticultural activity has been reported to facilitate positive affect or mood in people with depression (Gonzalez, Hartig, Patil, Martinsen, & Kirkevold, 2010) and dementia (Gigliotti & Jarrott, 2005). These results suggest that horticultural activities have an effect not only on affect but also on other psychological processes such as motivation and/or cognition. Thus, the present research investigated whether an exercise or gardening activity could contribute to the cognitive processes of elderly people. This study examined whether their cognitive performance could be enhanced or maintained by a horticultural activity.

Digit span, coding, and arithmetic tests were used to assess cognitive functions. Digit span testing has often been used to examine memory capacity, not only for elderly individuals but also for younger or middle aged individuals (Boone et al., 1992; Crook, Ferris, McCarthy, & Rae, 1980; Johansson & Berg, 1989; Maki, Zonderman & Resnick, 2001; Norman, Kemper, Kynette, Cheung, & Anagnopoulos, 1991; Parkinson, Lindholm, & Urell, 1980; Wechsler, 1981). A coding test is suitable for the assessment of motor performance and memory capacity, as it is easy for elderly people to understand the test procedures. As arithmetic operations are related to working memory (Raghuber, Barnes, & Hecht, 2010), this type of task was used to evaluate a different aspect of working memory than addressed by the span task. The properties of the cognitive processes and their maintenance will be summarized in the discussion section.

METHODS

Period of Study

A research program investigating the effects of horticultural activity on healthy elderly people was organized in 2006 and 2007. In this program, the activity was conducted both years for a 12 week period from July to September. The cognitive tests were conducted within several weeks before and after the period of the activity.

Participants

Overall, 92 healthy elderly people in Kanazawa city and the suburban area voluntarily participated in this study. The subjects were recruited through several local community associations in the city. Prior to the study, the participants had a medical checkup by a physician, and participants who were diagnosed as sufficiently healthy participated in the study. The participants reported no feelings of illness during the period of the study. All individuals in the study had normal or corrected-to-normal vision. Some participants used hearing aids to address hearing difficulties.

Table 1
Summary of participant characteristics. Mean ages and MMSE data are from the participants who completed the cognitive tests in both test phases, before and after the activity

	N (before)	N (after)	Mean age (oldest, youngest)	MMSE before	MMSE after
Experimental Group	47 (M=24,F=23)	37 (M=17,F=20)	72.7 (84,64)	28.16 (*SD*=1.34)	27.97 (*SD*=1.80)
Control Group	45 (M=21,F=24)	32 (M=13,F=19)	73.4 (84,66)	28.00 (*SD*=1.48)	27.97 (*SD*=1.64)

Note. Mean ages and MMSE data are from the participants who completed the cognitive tests in both test phases, before and after the activity. Neither the MMSE performances of the two groups in the two test phases was significantly different, examined with two factor mixed design ANOVA; test phase: $F(1, 67) = .228$, $p = .63$; group: $F(1, 67) = .076$, $p = .78$.

In 2006, 52 volunteers were recruited from two local communities. Volunteers from one community were assigned to the experimental group and participated in the horticultural activity. Volunteers from the other community were assigned to the control group, and simply spent their daily lives as usual without participating in the activity. The experimental group consisted of 27 people (14 males and 13 females) and the control group consisted of 25 people (12 males and 13 females).

In 2007, 40 elderly people were recruited from two additional communities. In the first community, 10 males and 10 females were assigned to the experimental group, while in the second community, 9 males and 11 females were assigned to the control group. Thus, in combination with the participants in 2006, the experimental group consisted of a total of 47 people and the control group consisted of 45 people. (Table 1)

Participants in the experimental group conducted cognitive tests as part of a health checkup before and after the period of horticultural activity, whereas people in the control group participated in the cognitive tests as part of a free health checkup. At the beginning of the study, subjects were briefed on the purpose and procedures of the study, and their informed consent was obtained. This study was approved by the Ethical Committee of Kanazawa University School of Medicine.

Horticultural Activity
In the horticultural activity, participants in the experimental group worked on horticultural activities requiring only mild exertion such as planting flowers or greens in a small garden and decorating a basket or a pot. They were guided in planting, handling, and arranging the flowers by professional gardeners. These activities not only allowed the participants to engage in horticultural work but also encouraged them to communicate with other participants, as these activities were undertaken by a group. The activity was held in a courtyard in a college every Saturday from noon to 4:00 pm for 12 weeks. The activity session also included a lunch and tea break. The participants in the control group were instructed to go about their lives as usual during the study period.

Assessments
First, all participants were administered the Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975) to screen their intellectual level. The test scores from participants with MMSE scores below the standardized critical point of cognitive impairment were eliminated from further analysis. Then, participants completed a series of cognitive tests. The cognitive tests consisted of three tests: the digit-span test, the digit/symbol coding test, and the arithmetic test. The digit-span test and the digit/symbol coding test were prepared with reference to the Wechsler Adult Intelligence Scale Revised (WAIS-R; Wechsler, 1981), the reliability and validity of which have been evaluated repeatedly as assessment for the cognitive abilities/functions and is well established. The Kraepelin test was used as the arithmetic test and is also well known as a test for cognitive assessment (Kraepelin, 1896; Uchida, 1951).

Test 1: Digit-span test. Two types of digit span tests were conducted; forward and backward tests. In the forward digit-span test, participants were visually or auditorily presented with a series of digits. They were then required to recite those digits in the order in which they were presented. In the backward digit-span test, participants were required to recite a series of digits in reverse order, from the last to the first.

In the auditory presentation, the experimenter verbally

presented a series of digits at a rate of one digit per second. In the visual presentation, Arabic numbers were serially presented one-by-one on the 15-inch color thin-film transistor (TFT) liquid-crystal display (LCD) monitor of a laptop personal computer (PC) (Toshiba, Dynabook Satellite J40), also at a rate of one digit per second. The digit numbers subtended 3 cm in height and 1.5 cm in width and were drawn in white on a black background. Participants sat in front of a table and watched the monitor from approximately 50 cm away. The presentation of numbers was controlled by a psychological experimental software package (Cedrus, SuperLab Pro). The order of auditory and visual digit-span tests were counter-balanced across participants. In each presentation condition, the forward digit-span test was performed first.

The first forward trial always began with three random digits, and the first backward trial began with two digits. A correct response increased the number of digits in the next trial, while an incorrect response terminated the condition. Participants were presented with a practice trial with two digits, such as 1-3, prior to the first test trial.

Test 2: Coding test. Three types of coding tests were prepared: the digit-digit coding test, the symbol-symbol coding test, and the digit-symbol coding test. The third test was prepared based on the WAIS-R (Wechsler, 1981). Participants were provided with a sheet of paper on which a series of digits or symbols were printed with the corresponding spaces left open. In the digit-digit task, participants were instructed to copy the digits to the blank spaces. In the symbol-symbol task, they were asked to copy the symbols to the blank spaces. In the digit-symbol task, a table with digit numbers from 0 to 9 and corresponding symbols was shown at the top of the sheet. The rest of the sheet contained rows of digit numbers with blank spaces. Participants were instructed to fill in the blanks with the symbols corresponding to the digits as shown in the table.

At the beginning of these tests the experimenter demonstrated the task using the first three digits, and then the participants completed the following seven blanks as a practice. Then, for the real test, they started from the 11th digit and filled out as many blanks as possible within 30 seconds.

Test 3: Arithmetic test. The participants were provided with a sheet of paper containing a series of digits in five rows of 25 digit numbers. Participants were asked to sum the neighboring digits and write the answer in between the numbers. The numbers were written in 16 point Gothic font, which was large enough for most of elderly people to read with or without eye glasses. At the beginning, the experimenter demonstrated the technique using the first three numbers. The participants then practiced the task with the next seven numbers. For the main trial, the participants started from the 11th number at the sound of the experimenter's voice. Participants were given 30 seconds to complete this task.

DATA ANALYSIS

The data from participants who could not participate until the end of the study period were eliminated from the analysis. The data from participants with MMSE scores below the criterion for mild cognitive impairment (MCI), i.e., from 22 to 26 points and below, were also excluded from the analysis. The MMSE scores were then examined by a two factor mixed design analysis of variance (ANOVA) with the two groups (experimental and control) and two test phases (before and after participation in the study) as the factors. In the digit-span test, a three factor mixed design ANOVA was conducted with factors of group (experimental, control), test phase (before and after the activity) and stimulus modality (auditory, visual).

RESULTS

Three participants dropped out of the activity and did not conduct the series of tests at the end. In total, data were obtained from 37 participants in the experimental group, with a mean age of 72.7 years old (oldest, 84 years old; youngest, 64 years old). For the control group, data were obtained from 32 healthy elderly people who participated in the cognitive tests in both phases and whose MMSE scores were above the criterion for MCI. The average age of these individuals was 73.4 years old (oldest, 84 years old; youngest, 66 years old) (Table 1).

The MMSE scores were not significantly different between the two groups in either test phase (test phase: $F(1, 67) = .228$, $p = .63$; group: $F(1, 67) = .076$, $p = .78$). Therefore, we attribute any differences in performance observed between the two groups to alterations in cognitive processes during the study rather than to differences in their original levels of cognitive performance.

Test 1: Digit-Span Test

Table 2
Number of correct responses in digit-span tests.

	modality	recall type	before	after
Experimental Group	visual	forward	4.95	4.89
		backward	3.57	3.46
	audio	forward	5.11	5.41*
		backward	3.78	3.95
Control Group	visual	forward	3.34	3.56
		backward	3.47	3.41
	audio	forward	4.78	4.81
		backward	4.59	4.31

Note. * Only the forward recall performance of the audio modality with the experimental group was statistically significant: $t(36) = 1.924$, $p < .05$

Performance in the auditory and visual presentation tests are plotted as a function of test phase in Figure 1 (Table 2), with separate panels for the forward and backward recall conditions.

In the forward condition, the main effect of experimental/control group ($F(1, 67) = 4.32$, $p < .05$) was observed. The performance in the experimental group was significantly better than that in the control group. Better performance was observed in the auditory presentation than in the visual presentation ($F(1, 67) = 8.06$, $p < .01$). The interactions between test phase and modality showed a trend toward significance ($F(1, 67) = 3.92$, $p = .052$). In the backward condition, none of the main effects or interactions were significant. However, trends were observed of a significant main effect in the presentation modality ($p = .057$) and of a significant interaction between the modality and the group ($p = .082$).

For the control group, the performance was better in the auditory condition than in the visual presentation condition. However, performance did not differ between the forward recall and backward recall conditions. No significant difference in performance was observed between the two test phases in the control group. In contrast, the overall performance in the experimental group was higher in forward recall than in backward recall. This result could indicate that the participants in the experimental group had a difference in motivation and/or cognitive competence from the people in the control group. Nevertheless, the auditory performance in the experimental group significantly increased after the activity (one-sided t-test: $t(36) = 1.924$, $p < .05$). This result indicates that the efficiency of cognitive processing increased in the experimental group and that these individuals might have developed a processing strategy or improved their skill in cognitive processing during the activity; for example, enhancing their working memory capacity.

Test 2: Coding Test
Differences in performance among the three types of coding tests are expected, reflecting the level of difficulty of the tests. In the digit-digit coding test, the performance in the experimental group seemed to increase slightly after the period of activity (Table 3). However, this increase was not statistically significant, with the result that the performance in both groups remained the same before and after the activity. In the symbol-symbol coding test, the performance in the experimental group increased significantly after the activity ($p < .01$), but not in the control group (Table 3). In the digit-symbol coding test, the performance in the experimental group significantly increased after the activity ($p < .01$), while the control group exhibited a marginal but significant increase in the second phase ($p < .05$) (Table 3). The latter result suggests that the performance in the second phase to some degree reflects the fact that participants get used to the task

Table 3
Coding performance for the three types of coding tests.

	digit-digit		symbol-symbol		digit-symbol	
	before	after	before	after	before	after
Experimental Group	45.05	46.54	36.76	38.81**	16.05	17.14**
Control Group	41.00	41.53	34.00	35.22	13.66	14.28*

Note. Number of items performed. The performance was examined by t-test (experimental group: $df = 36$, control group: $df = 31$). **$p < .01$; *$p < .05$.

or acquire the task skill. Nevertheless, the constant trend of enhanced performance after the activity in the experimental group indicates the strong effect of horticultural activity on these tasks.

Test 3: Arithmetic Test
The performance of the experimental group increased significantly after the activity ($p < .01$), whereas the performance in the control group did not change between the two tests (Table 4).

Table 4
Number of correct answers in the arithmetic tests.

	before activity	after activity
Experimental Group	22.95	24.68**
Control Group	17.44	17.66

Note. Number of items performed. The performance was examined by t-test (experimental group: $df = 36$, control group: $df = 31$). **$p < .01$.

Evaluation of Cognitive Processes
In general, the execution of these tasks requires a series of cognitive sub-processes. For example, the auditory forward digit-span test first requires the internal registration of the auditory digit input, followed by the retention of the digit information and then the vocalization of the information as an output. The backward digit-span test also requires the process of reversing the digit information before output, presumably by the central executive. The visual digit-span test also requires the transformation of visual image information to verbal information. Therefore, we assumed that cognitive operations were used to execute these tasks such as reversing information, transferring the information modality, and maintaining the correspondence of information and/or arithmetic operations, requiring central executive processes and information storage in the phonological loop and/or the visuo-spatial sketchpad.

Given these assumptions, the performance of such processes by the phonological loop, visuo-spatial sketchpad, or central executive can be evaluated by a subtractive method. For example, if a task consists of processes A and B, then the performance of A can be estimated by subtracting the task performance of B from the performance of A and B together. In this way, the performance of each process is removed from the test results. Figure 1 shows the changes in process performance in the experimental group before and after the period of activity. In the left panel of the figure, four subtractive functions were calculated from Test 1, i.e., the digit-span test. Here, all of the functions increased in performance after the horticultural activity. In particular, this figure reveals an increase in the difference in performance between the audio and visual input modalities in both the forward (Fwd: aud-vis) and backward (Bwd: aud-vis) conditions. This result indicates that the audio processing performance was enhanced after the horticultural activity by an improvement in the phonological loop relative to the visuo-spatial sketchpad.

The right panel of Figure 1 presents the evaluations from Test 2 and 3. In Test 2, digit numbers and symbols were used as the data. Digit numbers are familiar symbols in our everyday life, enabling participants to read digit numbers phonologically and handle them easily and automatically. Therefore, we presumed that the digit-digit task (dig) could be processed via phonological loop without almost any cognitive load. In the symbol-symbol coding test, non-alphabetical

"symbols" were used instead of digits, and these symbols were represented visually with imagery, meaning that they could not be read phonologically. As this process required visual memory, the symbol-symbol task (sym) was assumed to depend on the visuo-spatial sketchpad process. However, the digit-symbol test requires operations to maintain the correspondence of digits in the phonological loop and symbols in the visuo-spatial sketchpad. In other words, the digit-symbol task (d/s) should involve a central executive process to translate phonological information in the phonological loop to visual information in the visuo-spatial sketchpad. The task performance significantly increased after the activity (Table 3). This increase might depend on the phonological loop (PL) or visuo-spatial sketchpad (VS) process rather than on the central executive (CE) (Figure 1, right panel: PL - CE: dig - d/s; VS - CE: sym - d/s), as the functions exhibit a greater enhancement in sub-processes phonological loop and visuo-spatial sketchpad than central executive after the activity. However, no difference was observed in the improvement between the phonological loop and visuo-spatial sketchpad (Figure 1, right panel: dig-sym).

The arithmetic task (arth) involves the retention of numbers in the phonological loop or visuo-spatial sketchpad, the manipulation of arithmetic calculations by the central executive, and then a written and perhaps vocalized motor output. However, the subtractive evaluation of the processes suggest that the central executive performance estimated from Test 2 and 3 did not change much after the activity (Figure 1, right panel: CE: arth - d/s; CE: arth - dig).

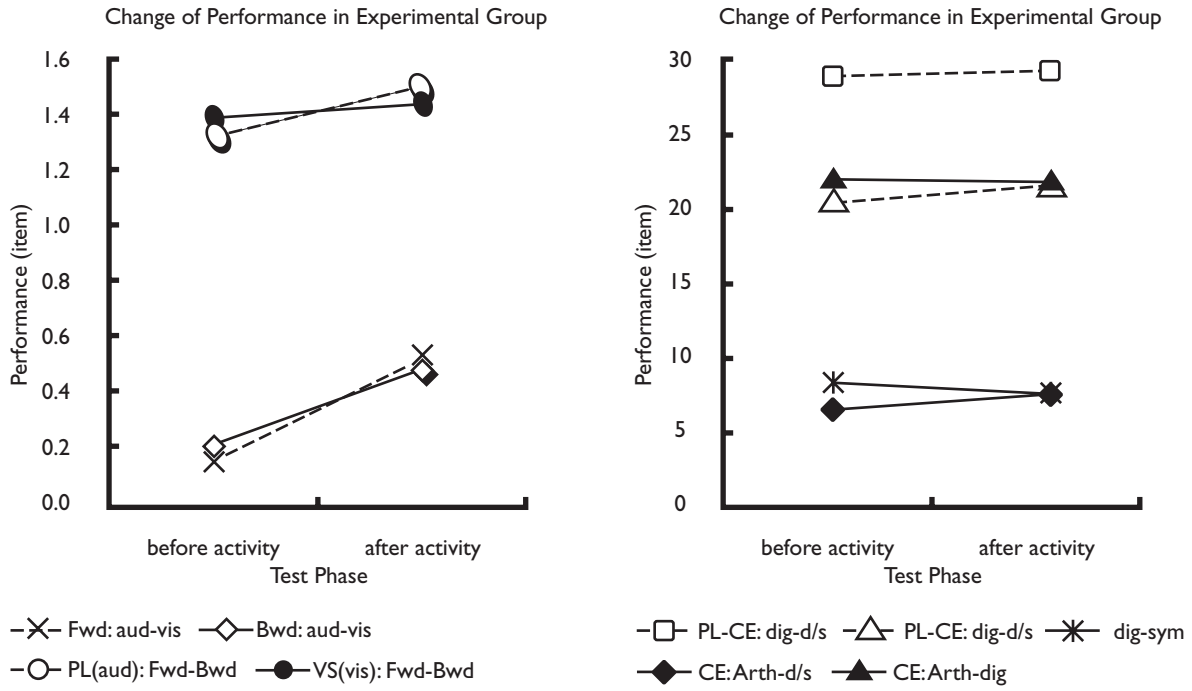

Figure 1. Changes in the performance of sub-systems examined by a subtractive method.

In the left panel, [Fwd:aud-vis] represents the difference in performance between the auditory and visual modalities in the forward recall condition. [Bwd:aud-vis] represents the difference between the auditory and visual modalities in the backward condition. [PL(aud):Fwd-Bwd] is the difference in performance between the forward and backward conditions in the auditory modality, while [VS(vis):Fwd-Bwd] represents the same difference in the visual modality. The difference in performance before and after the activity was only significant for [PL(aud):Fwd-Bwd] (one-sided $t(36)=1.92$, $p<.05$).

The right panel shows the performance of various systems as estimated from TEST II and III. [PL-CE:dig-d/s] represents the difference in performance between the digit coding test and the digit-symbol coding test, while [VS-CE:sym-d/s] represents the difference between the symbol coding test and the digit-symbol coding test. [dig-sym] is the difference between the digit coding test and the symbol coding test. [CE:Arth-d/s] represents the difference between the arithmetic test and the digit-symbol coding test, and [CE:Arth-dig] represents the difference between the arithmetic test and the digit coding test.

DISCUSSION

The present study showed that the cognitive abilities of elderly people could not only be maintained but also significantly enhanced by horticultural activity. The authors conclude that the activities in the present study affected the performance of cognitive processes.

The program employed in the present study was thought to have stimulated the internal cognitive processes of the working memory system. The subtractive examination of the model revealed that while the central executive performance itself did not increase, the phonological loop performance did. Van der Linden et al. (1994) investigated age-related differences in updating working memory using a running memory task. The authors then showed that the performance of older subjects was as good as that of younger subjects for the task requiring just the phonological loop, but was weaker with respect to memory updating processes that required central executive resources, as hypothesized by Morris and Jones (1990). There is also evidence that memory performance was improved by working memory training (Craik et al., 2007; Li et al., 2008; Richmond et al., 2011). Craik et al. (2007) showed that older adults who were instructed on the nature of memory and how to improve memory performance exhibited improved memory performance after 12 weeks of cognitive training. Li et al. (2008) investigated the performance effects of working memory practice by adults aged 70-80 years for 15 min per day over a 45 day period, and found substantial performance gains on the spatial working memory task that was practiced and a three month maintenance of those gains. Furthermore, Richmond et al. (2011) had 21 older adults aged 60-80 participate in 20-30 minutes of spatial and verbal working memory training for four to five weeks and found significant improvements in performance. These findings taken together with the present results suggest that the phonological loop in healthy elderly people can be revitalized by activity.

Several studies have demonstrated that horticultural therapy has a positive effect on the affect, mood, and heart rate of participants. For example, Wichrowski, Whiteson, Haas, Mola, and Rey (2005) showed that cardiac rehabilitation inpatients who participated to a significant degree in horticultural therapy exhibited a decrease in total mood disturbance score and heart rate. Bringslimark, Hartig, and Patil (2009) reviewed studies reporting the psychological benefits of working with indoor plants. However, to the current authors' knowledge, no studies in the literature have examined the effects of horticultural activity on cognitive function. The horticultural activity in the present study involves interacting with plants/greens/flowers, working to make a garden and/or decorations, and communicating with others. Further examination would be needed to clarify which of these components of the activity affected the cognitive performance of the participants.

Limitations

This study found that the activity had a significant effect on cognitive function, especially the phonological loop in the working memory. However, the mechanism and the reason why such an activity only affects to the phonological system and not the visual system is not known. Additionally, the assignment of participants to the experimental or control groups was not fully randomized, however, assignment was not intentional within either group for either year. Thus, although the cognitive performance levels between groups were not different, the difference of the performance between groups might be a result of the difference of the other characteristics or abilities which were not controlled.

Although the diversity of outcomes suggest the necessity for further research with regard to experimental design, measurement, analysis, and reporting methods, the findings in this area consistently support the view that some activities such as horticultural activity, physical activity, or social activity produce some beneficial effects to preserve cognitive function. Lövdén, Ghisletta, and Lindenberger (2005) reported that social participation attenuates declines in perceptual speed in elderly people. Scarmeas, Levy, Tang, Manly, and Stern (2001) followed 1772 non-demented individuals longitudinally, and found that engagement in leisure activities reduced the risk of incident dementia. Additionally, Tanaka et al. (2009) reported the benefits of physical exercise on executive functions in older people with Parkinson's disease. Exercise is even associated with a reduction in depression (Craft, 2005). Thus, although the effects of exposure to plants alone remains questionable, it is reasonable that the cognitive functions of elderly people would benefit from physical activity with/without plants as well as interactive activity. The present findings are consistent with those of previous studies showing that cognitive functions could be maintained and preserved, or even re-trained (Colombe & Kramer, 2003; Craik et al., 2007; Heyn et al., 2004; Kramer et al., 2006;

Williamson et al., 2009). The mechanism of the cognitive reserve can be understood in various ways, such as the efficient utilization or the new recruitment of brain networks (for a review, see Buckner, 2004 and Stern, 2002). The relationship between memory loss and atrophy of the brain is one important factor and has been extensively investigated. Thus, means of establishing cognitive reserves, especially in the clinical environment, have often focused on how to stop the depletion of neurotransmitters and tissues and thus have focused on medication therapy. In contrast, the present study reveals the possibility that elderly cognitive function can be enhanced with daily activities without medication. The present study also presented a way to evaluate cognitive sub-processes that would accommodate clinical demand to assess the profile of memory deficits and/or cognitive functions in elderly individuals (De Jager, Milwain, & Budge, 2002). Nevertheless, further research will be needed to investigate what types of factors are involved and how and why those factors affect the improvement and/or maintenance of cognitive functions in the elderly.

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Gardening and Virtue

Dan O'Brien

Some academics are driven throughout their careers by a particular intellectual problem and their path is straight. This is not the case with me. I began my academic career with a degree in biology, and only gradually - with some serendipity - discovered philosophy and then, after many years, secured a teaching position. In coming to write this introduction I remembered - and I had not thought about this for many years - that, along this path to philosophy, I very nearly became a horticulturalist at Pershore College, Worcestershire, but at the time to move away from the city was something I could not quite bring myself to do. Instead I took to urban gardening and vegetable growing, and, as you will see in this paper, this has not been wholly divorced from my day job. Here I explore how gardening relates to philosophical views on virtue, and I suggest that this may be relevant to the practice of therapeutic horticulture.

GARDENING AND TRANQUILITY

Gardening is psychologically beneficial in various ways to the gardener. A frosty morning out with the cabbages brings a glow to one's cheeks and to one's soul. But why? What is the source of the well-being that gardening provides?

Gardens are generally quiet places and tend therefore to promote feelings of peace and reassurance. And there are, of course, sensory pleasures: the smell of lavender, the colors of the lilies and the springiness of the chamomile. Such pleasures can lead to deeper engagement with the garden. Blooms can hold one's attention, as can trees and expanses of grass. Certain corners of the garden may not be beautiful, yet the snail shell or the rotting compost can enrapture. And they can do so, not because one is focused on the prizes they might win or on the dishes one may concoct with them: one's appreciation, rather, is for the things themselves - the fritillaria flower, the wisteria bloom, or the slug sliding over the rotting stalk of broccoli in the compost bin. Gardening can thus enhance one's capacity to enjoy beauty and extend it even to slugs and rotting broccoli. As Robert Harrison (2008) puts it in his *Gardens: An Essay on the Human Condition:* "Like Eve's eating of the pomegranate, gardening brings about a transformation of perception, a fundamental change in one's way of seeing the world, call it a phenomenological conversion" (p.30).

David Cooper (2006), author of *A Philosophy of Gardens* - one of only a handful of academic philosophy books devoted to gardening - takes our ability to appreciate the garden in this "disinterested" way to be a virtue, and thus gardens as improving us. We can see that such an attitude is virtuous by considering the kind of person who is only interested in the prizes or the gastronomic experiences offered by their vegetable patch: there would be something missing in them - an aspect of character that we think it good to possess - a virtue. William James (1892/1985) also talks of the psychological benefits of "involuntary attention," when, for example, we find ourselves just looking at the tulip, as opposed to actively looking for the trowel.

If we think about such experiences, we think of tranquil moments - and tranquillity, in various forms, seems to be a key aspect of gardening. The eighteenth century essayist, Joseph Addison (1712/1850), notes the relation between gardens and tranquillity.

> *A Garden… is naturally apt to fill the Mind with Calmness and Tranquillity, and to lay all its turbulent Passions at Rest. It… suggests innumerable Subjects for Meditation. I cannot but think the very Complacency and Satisfaction which a Man takes in these Works of Nature, to be a laudable, if not a virtuous Habit of Mind.* (p.229)

And here is the Canadian poet, Patrick Lane (2006), talking of this feature of gardening:

> *To be calm and quiet sometimes requires I be motionless and so I stop by the pond or under an apple tree and meditate. Yet there are also times when action is required, for action too can bring tranquillity. Some of my most tranquil moments have arrived during hard physical labour. An eight-hour day… in a sawmill pulling two-by-fours was tranquil. So are the present hours spent digging up an overgrown garden bed, lifting the weeds, and placing the old plants back in the replenished earth.* (p.233)

Lane has been an alcoholic for most of his adult life and his book, *What the Stones Remember*, charts his recovery in part aided by working on his garden in British Columbia.

What I want to investigate is the source of such tranquillity. I shall look at two accounts, perhaps compatible in that both could be true of gardening. I shall first consider a psychological account of well-being and then I shall suggest that philosophical reflection on the virtues can provide further illumination.

Well-Being

In a recent book, *The Pursuit of Unhappiness* (2008), Daniel Haybron explores various dimensions of well-being. (The book has this title because Haybron claims we are not very good at knowing what makes us happy and much of our lives are engaged in the active pursuit of things and goals that make us unhappy. For example, does the 55 inch plasma TV, or, indeed, the 55 inch Italian terracotta pot, compensate for the 40 hour week behind a desk?) Haybron's account is distinct from other accounts of well-being, such as those based on the hedonistic summing of pleasures or the satisfaction of desires. Here, in this paper, I shall show how his suggested dimensions of well-being are manifest in gardening and gardeners.

First, there is attunement. This is manifest in feelings of tranquillity or inner surety (perhaps what the Stoics, an ancient school who attempted to avoid destructive emotions such as jealousy and anger, called ataraxia). As one leans against the shed as the sun is setting one feels, as Haybron puts it, "psychically… at home in one's life" (p.116) - one's day-to-day anxieties float away.

Such attunement leads to engagement. One steps inside and becomes engaged in activity - potting on, cleaning tools, and pinching off the flowers from the basil plants in the greenhouse. One can become lost in such activity, unaware of the passage of time, and even of oneself: "This is when I am most content.… Time ceases to exist and hours are imagined things. The simplest physical task takes us out of ourselves. Like weeding, the most mundane endeavor is sometimes the most rewarding" (Lane, 2006, p 94).

The psychologist, Csikszentmihalyi (1990), talks of such times in terms of a state of *flow* - he kind of state familiar to the athlete, the knitter, and the dancer. Before one knows it the sun is setting and the tools must be packed away. Lethargy or listlessness melts away in activity:

> *…people become so involved in what they are doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing. . . the loss of a sense of self separate from the world around it is sometimes accompanied by a feeling of union with the environment.* (pp.53, 63)

Monty and Sarah Don's 2005 book *The Jewel Garden* charts their recovery from financial ruin and depression, and they note that their garden "is so deeply entrenched in our lives that sometimes it is hard to know where the garden begins and we end." (p.91)

Engagement then leads to endorsement. Here, pleasurable feelings are important. One becomes conscious of one's activity, and perhaps of the productivity of one's plot or the beauty of one's blooms. To be happy - and for one's life to be going well - is for one's life to be broadly favorable across these three dimensions of attunement, engagement, and endorsement. Haybron argues that the most important is attunement, the state most associated with tranquillity, and the state which gardening is well-suited to achieve. The happiness of gardening is perhaps rarely manifest in feelings of endorsement - blooms and good crops

are fleeting; it is more commonly manifest in those foot-on-the-spade, quiet moments. Gardening has its obvious highs, but the kind of well-being with which it is most associated, and perhaps one of the sources of the therapeutic role of gardens, may lie not just in these, but in the richer psychological grounds for emotional well-being that Haybron explores.

Such an account certainly seems to reflect what philosophers call "the phenomenology" of gardening - our conscious experience of it; but whether Haybron's account successfully captures what it is to live a good life is something I will not explore further here. In the rest of this paper, however, I will explore a distinct account of what it is about gardening that helps it contribute to a good life. This is an account grounded in the virtues.

Virtue

The tranquillity that gardens and gardening bring need not be thought of merely in terms of pleasant feelings, pleasant states of consciousness, or flow: such tranquillity, rather, can be seen as rooted in ancient accounts of virtue. Aristotle (350 BCE/2000) claims that well-being - or what he calls eudemonia or "human flourishing" - involves "activity of the soul in accord with virtue" (1098a; p.12). It is not that living virtuously brings in its train the good things in life - feelings of contentment and satisfied desires - virtue thus being a means to an end; well-being, rather, is constituted by exercising virtues of character. Epicurus' account, in contrast to Aristotle's, has a more hedonistic flavor: pleasure is what matters, but it so happens that a virtuous life is a pleasurable one. The terminology with respect to debates concerning happiness and well-being can be confusing and it would thus be helpful to provide some definitions. When I say pleasure, I have in mind sensuous pleasures such as those associated with eating great food and feeling the sun on one's face - and there are, of course, such pleasures associated with the garden. These are, though, distinct from the kind of well-being associated with living virtuously and it is this kind of well-being and its relation to gardening that I would like to explore further.

My interest in virtue theory arose through work on the eighteenth century philosopher David Hume. Hume is a virtue theorist; his account, though, is distinct from the Aristotelian one and more akin to that of Epicurus, in that virtues are ultimately grounded in the utility and pleasure they bring to oneself and to others. The virtues are not, in themselves, excellences of character. We cannot help but feel that certain ways of acting are praiseworthy and this is because we are aware of the good effects of such traits on ourselves and, through empathy, on others. It is these traits we see as virtues.

Julia Annas in a recent book, *Intelligent Virtue* (2011), develops an account of virtue influenced by ancient thought. Virtues are akin to practical skills. One cannot simply learn them from books; one must be habituated in circumstances where courage, for example, is necessary and through experience one must learn when and how to be courageous. Further, having courage is not just a matter of being disposed to act in a certain way; it is, rather:

> *…the kind of actively and intelligently engaged practical mastery that we find in practical experts such as pianists and athletes…. Virtues…are states of character… that enable us to respond in creative and imaginative ways to new challenges. No routine could enable us to do this.* (pp.14-15)

There is a depth to the virtues. They are not just surface properties of a person, as, say, beauty may be, or habitual ways of acting like bravado might be, but persisting features that one might say are characteristic of a person.

Annas also explores the relation between virtue and well-being, and her account is well-suited to gardeners. Mastering a skill is enjoyable, but the enjoyment is not the kind of pleasure associated with eating ice-cream or lying in the sun. Learning piano scales is not pleasurable in this sense, nor is learning that languid form of digging or hoeing that does not hurt one's back, or how to pick one's blackcurrants without squashing them. As virtues are akin to practical skills, this kind of enjoyment is also characteristic of being virtuous - of learning when and how to be courageous, patient, or humble. "Like the master craftsperson the virtuous person experiences enjoyment and satisfaction in her activity and not just in the result" (p.82).

> *It is very plausible that the enjoyment of virtuous activity does not consist in felt twinges of pleasure. It consists, rather, in the way the activity is done; this is not something extra to be added on but just is the ready and unselfconscious way the activity is performed.* (p.76)

Living well is not primarily a matter of experiencing as many pleasurable feelings as one can. It is about how

one responds to one's lot - it's about how one lives one's life.

> *Happiness is at least in part activity. If we fully take this on board, putting the feel-good accounts of happiness on one side, it becomes clearer why what makes us happy couldn't just be stuff sitting there in our lives, or passive states of feeling or satisfaction. To live happily we require something with as much dynamism and internal drive as happiness itself has, and the virtues provide this.* (p.152)

We have seen, then, that various thinkers relate the virtues to the good life, but here we need not worry about the details of the theories put forward by Aristotle, Epicurus, Hume, and Annas. What is important is only that we see virtues as playing a role in the good life, and that we have a reasonably clear idea of the kind of virtues such thinkers have in mind - traditionally, such traits as benevolence, patience, and courage. My claim, in what follows, is that gardening helps inculcate such virtues in us and it is through this that well-being is enhanced. Gardening involves the acquisition of certain practical skills, of, for example, pruning and hoeing, and mastery of these will bring well-being just as do mastery of a musical instrument or an athletic pursuit. But gardening also engages with traditional virtues such as patience and humility and these have a wider effect on one's well-being and how one lives one's life.

Isis Brook (2010) notes that gardeners must have, amongst other virtues, patience, sturdy independence, and humility. The claim is not merely that patient people will be good gardeners, or that gardening can teach us useful lessons about patience, but that patience is cultivated by gardening: the yearly wait for the morning glory seeds to germinate can make the gardener a more patient person. "[I]n the garden, things happen in their own time and a desire to see immediate results will impair our ability to properly engage with the activity of gardening" (p.20). This is something also noted by Donald Norfolk (2001): "The more time we spend in a garden the more patient we become and the more we learn to co-operate with the inevitable" (p.231). Such patience also increases our tolerance to pressures outside the garden: "Moreover, as we interact more closely with nature we find subtle but important changes occur in our attitude and behaviour towards others. We become calmer, more tolerant and more patient" (p.237); "We spend our time coping with leaf curl, milkdew, cankers, grey mould, brown rot, die-back, blights and galls, and this makes it easier for us to tolerate the peccadilloes of our neighbours and friends" (p.224).

Patrick Lane (2006) provides a vivid description of this aspect of gardens and gardening.

> *Patience and endurance are two virtues I have tried to learn this year. Last year I watched a slender wisteria vine flail in the breezes coming out of the south. The tendril slapped against the high, flat wall at the front of the house. Each day it grew and each day it reached a little further until, finally, it found a thin crevice in the shingle. The tip of the wisteria curled into the thin slit and took purchase.* (p.225)

Following another terrible spring in the UK, my vegetable plot looks rather sad this year. Again! But there is consolation: year by year, as gardeners, we cultivate virtue: "The activity of gardening promotes humility through the process of seeing our human plans and fancies overridden by natural processes in the garden" (Brook, 2010, p 21). The clearing of weeds or the eradication of slugs can seem a task akin to that of Sisyphus, condemned by the Gods to push a boulder up a mountain for all eternity. Each spring the weeds and slugs return - relentlessly. Albert Camus (1955/2005), the French existentialist philosopher, asks whether Sisyphus is happy, and answers Yes; and we, Sisyphean gardeners, can, hand on heart, also answer Yes. I am suggesting, though, that the kind of happiness or well-being in question here is best not seen, as Camus claims, as some kind of existential shaking a fist at the absurdity of life, or as that grounded in feelings of pleasure, but the kind of well-being that accompanies a life lived virtuously - a life with, for example, the right amount of patience and humility.

Gardening also manifests an important aspect of Aristotle's account of virtue. As we all know, gardens take work, and industry is plausibly a virtue. The gardener, though, must not be too driven. Virtues have associated vices. Perseverance can be in excess. In Hume's 1777 essay, *Of Refinement in the Arts*, he stresses the benefits of indolence: "human happiness… seems to consist in three ingredients: action, pleasure, and indolence" (p.269). A balance is required and good gardening keeps this balance. The relentless slug exterminator or the manic propagator are not gardening well. To do so they should, from time to time, lean on their spades and puff on their pipes, or sit under the pergola and watch the butterflies flit over the wallflowers. Monty Don, the TV

gardener, talks of pottering. Pottering in the garden may not be as industrious as one could be, but "[p]ottering and happiness are very likely bedfellows. There is much to be said for it (in Wilson, 2008, para.7)."

Patrick Lane (2006) is again apt: "Like Montaigne, I don't want to take this garden of mine so seriously it banishes the pleasure I take in the planting, the harvest, and most of all the joy in being a part of it" (p.201); Montaigne (1580), the 16th century philosopher and essayist, having said, "let death take me planting my cabbages, indifferent to him, and still less of my gardens not being finished" (p.62).

Intellectual Virtue

Talk of virtue suggests character traits with an ethical dimension, but I would also like to claim that there are distinctive epistemic or intellectual virtues and that these are also enhanced by gardening. Again, Hume is instructive.

Hume's most famous argument, and one of the most notorious in the history of philosophy, is what has come to be called the problem of induction. He argues that we have no good reason to think that the sun will rise tomorrow or that any regularities that we have experienced will continue in the way that they have. It is not just that we cannot be sure that the snowdrops will be white next year - there could always, for example, be a mutation that affects their color - but that we have *no reason at all* to think that they will be. We may have evidence that all snowdrops in the past have been white, but this tells us nothing about their color in the future; that would be to assume what one is trying to prove - that is, that past regularities continue into the future. All students of philosophy know how frustrating this argument is - it is really not clear how to refute it, and yet it is impossible to accept - and there are various interpretations of what exactly Hume is sceptical of, and how we should respond to his argument.

A common theme is that such sceptical arguments cannot be refuted by philosophical argument; they are rejected, rather, by embracing everyday cognitive standards, by confining ourselves "to common life, and to such subjects as fall under daily practice and experience." (Hume, 1772/2000, p.162) Such acquiescence in daily practice and experience has a therapeutic role, helping us to avoid the "philosophical melancholy and delirium" (Hume, 1739/2000, p.239) associated with such scepticism. Gardening is just the sort of pursuit to aid this immersion in common life and, in doing so, inculcate intellectual virtues. This does not amount to adopting the kind of reasoning pursued by, in Hume's words, the "vulgar," but rather that of the "artisan."

> *A peasant can give no better reason for the stopping of any clock or watch than to say, that commonly it does not go right: But an artisan easily perceives, that the same force in the spring or pendulum has always the same influence on the wheels; but fails of its usual effect, perhaps by reason of a grain of dust, which puts a stop to the whole movement.* (1739/2000, p.132)

The artisan has a more sophisticated grasp of regularities, in this case, mechanical regularities. These are sometimes disturbed because there is a "secret opposition of contrary causes" (Hume, 1772/2000, p.87) and here the artisan explains a broken watch in this way. A kitchen gardener similarly explains his unusually poor harvest as due to cucumber mosaic virus or scale bugs. Gardening thus develops our appreciation of the regular run of the world, and it is an activity especially well-suited to this. Gardeners must be sensitive to regularities of varying scope - those, for example, manifest by the seasons, the weather, disease, and germination - and to the "contrariety of causes" that may on occasion cause one's flowers not to bloom or one's fruit not to ripen. Gardeners are artisans, par excellence, having a fine-grained appreciation of the long-term and short-term changes in nature and how they embed together. Such appreciation is a manifestation of virtue - intellectual virtue - and as such there is a certain kind of well-being associated with being sensitive to such regularities and of having such knowledge.

Further, with the gardener's fine-grained awareness of the regularities of the garden comes a focus on the future. Such future orientation - and the positive role this has with respect to one's sense of purpose - is noted at various points in Karel Ĉapek's (1929/2002) run through *The Gardener's Year*:

> *But, but, there's still you, radiant Phlox, vicarage flower, and you, golden Groundsel and Goldenrod, golden Cone Flower, golden Harpalium, golden Sunflower, there's still you and me, we won't give in yet, far from it! Spring lasts the whole year and youth lasts the whole of life; there is always something to flower. We only say that it is autumn;*

in reality, we are coming into bloom with another sort of flower, we are growing underground, we are putting on new shoots, and there is always something to do. (pp. 113-114)

The future is not ahead of us, for it is already here in the shape of a shoot, it is already among us…if we could see the secret bustling of the future among us, we would certainly say that our nostalgia and our misgivings are a load of rot, and that best of all is to be a living person, that is, a person who grows. (pp. 153-154)

With such future orientation comes hope - a virtue. (One should note, though, that Ĉapek's humor is in some tension with the claims concerning virtue: "much of the comedy of the book lies in the recognition of man's arrogance, impotence and inevitable frustration" (G. Newsome, Afterword to Ĉapek, 1929/2002, pp.187-188) - vices, not virtues.)

CONCLUSION

I have suggested, then, that gardening cultivates virtues in the gardener, traits such as patience and humility, and it can also teach us to become good reasoners. Further, these virtues can become self-reflexive and, in doing so, further contribute to a good life. Caring for one's basil seedlings brings a sensitivity that one can apply to one's fellows and to oneself. "To the degree that life animates them both, soil and soul both lend themselves to cultivation, or to the gardener's caretaking activity" (Harrison, 2008, pp.63-64). "By tending, we learn tenderness" (Norfolk, 2001, p.230). "In the nurturing of a garden we are thereby nurturing patience as a personal disposition" (Brook, 2010, p.20). One sometimes, for example, also needs to give oneself time. And settling into - acquiescing in - the regularities of the artisan, and the many cycles and epicycles of the gardening year, inevitably gives one's life structure and unity. A fragmented life of drifting from one activity to the next is not a good life. A person's frustrating and unproductive day can be saved at "that afternoon hour when he administers the sacrament of water to his garden" (Ĉapek, 1929/1992, p.42), and in this act one revives the garden and oneself.

However it may feel as we double dig the vegetable patch on a windy March morning, gardening is good for us - it enhances our well-being. And it does this, I have argued, in various ways. The tranquility of a garden can be seen to lie in its pure sensory pleasures, in the way that it can hold our attention and provide us with opportunities for attunement, engagement, and endorsement - all dimensions of happiness. And it also, and this has been the main focus of the paper, promotes well-being through virtue.

If this is so, then perhaps virtue theory could inform the practice of therapeutic horticulture. Some virtue ethicists have suggested that the virtues should be central to medical ethics, but their focus has been on virtues manifest by medical practitioners, such as compassion (see Armstrong, 2006). My focus, however, is on the patient and how emphasis on their virtues can enhance their well-being. Further work would involve the empirical testing of such claims. Do rainy springs really increase our humility; does hoeing really, as John Updike (1993) suggests, create souls?

I sometimes fear the younger generation will be deprived
of the pleasures of hoeing;
there is no knowing
how many souls have been formed by this simple exercise. (pp. 40-41)

If so, then therapeutic horticulture has ancient roots.

I shall end with a passage from Colette's 1928 autobiographical novel, *Break of Day*, that encapsulates some of what I have been talking about.

To lift and penetrate and tear apart the soil is a labour - a pleasure - always accompanied by an exaltation that no unprofitable exercise can ever provide. The sight of upturned soil makes every living creature avid and watchful. The finches followed me, pouncing on the worms with a cry; the cats sniffed the traces of moisture darkening the crumbling clods; my bitch, intoxicated, was tunneling a burrow for herself with all four paws. When you open up the earth, even for a mere cabbage-patch, you always feel like the first man, the master, the husband with no rivals. The earth you open up has no longer any past - only a future… Gardening rivets eyes and mind on the earth, and when a shrubby tree has been helped, nourished, supported and cosily settled in its mulch covered with fresh earth, its expression, its happy look fill me with love. (p.77)

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AHTA Annual Conference Honoring the Past, Envisioning the Future Celebrating AHTA's 40th Anniversary

September 20-21, 2013
Minneapolis, Minnesota

Keynote Address

Strong Roots Support New Generations of Growth
P. Diane Relf, HTM, PhD
This session highlights the people who have served AHTA, the struggles and the achievements of AHTA, interaction with other professionals and professional organizations, and key factors to consider in future growth. Attendees at this presentation will have insight into what makes people commit large part of their time and career to development of an organization and why it is important to have knowledge of the history of the organization. Participants will be able to think more clearly about their role in the future of AHTA and how to make knowledgeable choices about their commitment to a role in AHTA.

***Dr. Paula Diane Relf, HTM**, received the first PhD in the U.S. addressing horticulture as a therapeutic and rehabilitation tool in 1976. She is a co-founder of AHTA, past president, first executive secretary, and longest continuous member of AHTA. She is a Professor Emeritus from Virginia Tech University where she established the Virginia Master Gardeners program and the Virginia Gardener mass media and educational program; taught consumer horticulture and horticultural therapy; and conducted an active research program in therapeutic application of horticulture. She has published extensively, consulted and lectured throughout the U.S. and 16 other countries, and been recognized as a Fellow of the American Society for Horticultural Sciences. Other recognitions include receiving the Founders Award from AHTA in 2003 and the American Horticultural Society's prestigious America's Gardener Award for Horticultural Therapy.*

Plenary Session
Envisioning the Future: Keys to Success for Horticultural Therapy

Matthew Wichrowski, HTR, MSW
Explore the state of the art of HT around the world with practice recommendations from leaders in the field. An expert panel will discuss keys to success for our future. Attendees will gain an understanding of the programs, practice models, research, and new developments as well as an understanding of important issues relating to future success in our field including research, publishing, marketing, education, and social media. Attendees will come away with information on important issues in the field and ideas on how to position themselves for success in the future.

***Matthew Wichrowski, MSW, HTR**, has been Sr. Horticultural Therapist at the Glass Garden in Rusk Institute for almost 20 years. He is a board member of AHTA and is leader of the Research Work Team. Matt is an instructor in the New York Botanical Garden HT Certificate Program and regularly presents at national and international conferences. His work is regularly published in HT related newsletters, magazines, and journals.*

Thirty Years of Programming in Tennessee: Then, Now & Future

Douglas Airhart, HTM, PhD
This session includes a discussion of program development for people recovering from substance abuse, training for practitioners developed by Memphis Botanic Garden, and program challenges and successes over the past 25 years. Participants will learn specific steps to be used to develop a program for substance abuse populations; be able to devise flexible training topics for a myriad of program objectives, clients and practitioners using local resources; and be able to apply HT programming in a variety of environments and settings.

***Dr. Airhart** is a professor in the School of Agriculture at Tennessee Tech University, teaching horticulture production and management courses. He is a master level horticultural therapist, served on AHTA's Board of Directors and Executive Committee for many years, including as president from 1987-89. He has published numerous articles on consumer horticulture and tree care technologies. He is a Certified Arborist.*

Using Social Media to Boost Your HT Practice: Beginner's Welcome!

Beverly Brown, HTR, PhD
Collaboratively designed by AHTA's Online Communications work team, this presentation provides an overview of key social media technologies and highlights potential benefits and applications of each for horticultural therapists. Participants will gain a general understanding of the benefits of using social media in a business context. In addition, they will become familiar with the characteristics of major social media channels, the respective applications of each in horticultural therapy, and learn practical hints and tips for getting started in social media.

***Beverly Brown** is Associate Professor in the Biology Department at Nazareth College, Rochester, NY.*

Instrumental in developing a minor in horticultural therapy at the college, she is currently designing curriculum for an HT major. She also works with Nazareth College's Creative Arts Therapy Program (CATP) and Aphasia Clinic where she treats clients. Beverly serves on the AHTA Board of Directors and is on the credentialing and online communications work team. She has also served on the AHTA internship task force and is an internship supervisor.

Reaching Out for Resources: Working Toward Sustainability Within & Beyond Your Organization

Karen Wolfgang, MA, and Isabel LaCourse

Identify resources that can be drawn on in therapeutic settings to enhance the comfort of the therapist and to maximize the effectiveness and reach of the work (s) he is doing. Participants will leave with a shortlist of challenges that they face in their work, and a list of potential resources for addressing those challenges (examples of such resources include garden maintenance providers, community networks, grant opportunities, and media). They will be able to recognize and take advantage of opportunities for peer and community support in their particular situations.

***Karen Wolfgang** has a BA in Anthropology and Environmental Studies from Princeton University and an MA in Educational Leadership from Portland State University with a specialization in leadership in ecology, culture, and learning. She is certified in permaculture design and accredited as an organic land care provider. She co-owns Independence Gardens in Portland, Oregon with Isabel La Course.*

***Isabel LaCourse** is currently pursuing dual bachelor degrees in School Health Education and Community Health, with a minor in Native American Studies. She is a Master Gardener and co-owns Independence Gardens LLC in Portland, Oregon with Karen Wolfgang.*

Collaboration:
Enhancing Patient Centered Care

Kate George

Collaboration between HTs and other professionals can lead to improved outcomes for clients. Explore examples of techniques that can be applied to many settings and learn strategies to achieve successful outcomes. Participants will be able to give at least three examples of how a horticultural therapist can adapt horticulture activities when collaborating with other professionals and will be able to explain the importance of being part of the treatment team. They will be able to list at least three benefits and will be able to give examples of co-treating in different settings.

***Kate George** has a BS in plant science from Rutgers University with a concentration in horticultural therapy. She has been a horticultural therapist at NYU Langone Medical Center for seven years and worked at St. Joseph's Children's Hospital for three years. After completing the horticultural therapy certificate program through Legacy Health Systems she completed an internship through the Glass Garden at NYULMC in 2006. In addition to working with adult and pediatric inpatients, Kate specializes in programming for children including those with Autism spectrum disorders (ASD). Kate leads gardening groups at senior centers throughout NYC, including an Alzheimer's and Dementia support group.*

All Hands In:
A Sealed Greenhouse

Katie Stoudemire

Do you want your clients with compromised immune systems to be able to safely grow plants? Learn about the collaboration, evaluation instruments, and use of a newly designed sealed greenhouse. Participants will learn about and experience the use of a new tool that can be used to safely grow plants with clients that have compromised immune systems. they will also learn about the evaluation tool used to collect data for this program, which can be modified for use in other settings. Participants will also gain an understanding of a specific example of intra- and inter-university collaboration.

***Katie Stoudemire** holds a BS in Biology from Davidson College and is responsible for creating and implementing the Healing and Hope Through Science Program, which is a part of the North Carolina Botanical Garden. This program brings natural science activities to hospitalized children. Katie has ten years of experience as a natural science educator, as well as seven years of experience working with hospitalized children.*

Make Every Space Count:
Creating Places that Heal

Geoff Roehll, ASLA, CLARB

This session will focus on how healthcare providers can utilize unique spaces on their campus to create healing environments that offer users places of respite while also attracting nature. Participants will learn the value

of incorporating healing and therapeutic spaces into their facilities and will understand how to successfully integrate these spaces into their already existing facility. In addition, participants will comprehend the elements that should be considered when planning these spaces.

Geoffrey Roehll, ASLA, CLARB *has a BS in Landscape Architecture from Purdue University and is a licensed landscape architect. He is leader in the Hitchcock Design Group Healthcare and Senior Living Studio, and has demonstrated his leadership, management, planning, and design skills on prominent projects throughout the Midwest and southern United States that include therapeutic and healing gardens. Geoff is an instructor at Chicago Botanic Garden Therapeutic Garden Certificate program and is invited to speak at many conferences.*

Cultivating Cultural Competency

Nancy E. Young, MA

Want to learn vocabulary and concepts regarding culture? Ready to explore how culture impacts the way you behave and communicate? Join this session to gain practical tips for HT use. Participants will learn fundamental vocabulary used in the intercultural relations field and will be exposed to some theory about intercultural communication. Participants will be able to implement practical intercultural communication tips in daily work as an HTR.

Nancy E. Young *has an MA in Intercultural Relations and is a Fulbright Scholarship recipient. She is currently completing her HT certificate through Legacy Health. Nancy has extensive professional experience and academic training in the field of intercultural relations and has presented at many conferences. She has provided intercultural trainings to groups including the staff of New York University's student health center, NYU's public safety office, and the Oregon Sexual Assault Prevention Task Force. Nancy is a gardening volunteer, an active member of the Association of International Educators, Oregon Women in Higher Education, and the Society for Intercultural Training and Research.*

Publishing Your Research in Horticultural Therapy Where and How

Jane Saiers, PhD

This session will provide participants the foundation for selecting the best audiences and journals for their research studies and familiarize them with the process of submitting manuscripts to healthcare journals. Participants will be able to (1) articulate considerations involved in selecting the best target audience for horticultural therapy research studies; (2) state strategies for identifying appropriate peer-reviewed journals for submission of horticultural therapy research studies and criteria for selecting the best journal for their research; and (3) complete an electronic submission of a research-based manuscript to a peer-reviewed journal.

Dr. Jane Saiers *received her doctorate in Psychology and Neuroscience from Princeton University and her BA in Psychology with a double major in English from Indiana University of Pennsylvania. She is completing requirements for the HTR credential and pursuing an Associate's Degree in Sustainable Agriculture at Central Carolina Community College. Her internship at the North Carolina Botanical Garden entailed planning and providing horticultural therapy services to populations with traumatic brain injury, substance use disorder, severe mental illness, dementia, and to the homeless. With her husband, she owns and operates Ramble Rill Farm, Inc., which provides vegetables, fruits, mushrooms, and herbs to local markets in and near Chapel Hill, North Carolina.*

Plant Selection for Specialized HT Programming

Rebecca Haller, HTR

Participants will create themed plant lists for a variety of HT program purposes, with an emphasis on annual plantings that may be used across plant zones. Participants will 1) identify factors to consider for plant selection and 2) identify specific plants for HT use.

Rebecca L. Haller, HTM*, earned her MS in Horticultural Therapy from Kansas State University and is the director of and teacher in the Horticultural Therapy Institute in Denver, Colorado. As co-editor of Horticultural Therapy Methods, she has written and provided instruction about the processes of horticultural therapy, with a particular emphasis on employing professional methods and practices. She established a vocational horticultural therapy program in Glenwood Springs, Colorado for adults with developmental disabilities that is still thriving after more than 30 years in operation. She designed and taught a series of professional courses at Denver Botanic Gardens. She has served as president, secretary, and board member of AHTA.*

Developing Core Competencies in HT Rehabilitation Medicine

Teresa Hazen, HTR, MEd, QMHP

This session defines rehabilitation medicine and history related to gardening, horticulture, and HT. The evidence base, medical terminology, assessment, session planning, and other standards of practice will be discussed. Participants will (1) describe three key events regarding rehabilitation medicine and HT history, (2) summarize three core competencies for rehabilitation medicine work; and (3) outline a plan for continuing education.

***Teresia Hazen, MEd, HTR, QMHP** has worked at Legacy Health since 1991 in long-term care, SNF, cancer services, pediatrics, behavioral health, and rehabilitation units. She oversees gardening programs in ten therapeutic gardens in Portland, Oregon. Teresia served on the AHTA Board of Directors from 1995-1999. She continues active participation in AHTA's conference and awards work teams.*

Therapeutic Beauty of Flower Arranging

Ellen Jones, HTR

This program will address the beauty, figuratively as much as literally, and efficacy of using flower arranging in a successful HT program and how to present it to clients. Participants will be able to understand how and why flower arranging can be a successful therapeutic modality. Participants will be able to identify community resources to support this activity and will able to identify specific client goals and objectives that can be obtained using this activity.

***Ellen M. Jones, HTR**, graduated from VA Tech with a degree in ornamental horticultural and a focus in horticultural therapy. She interned at Friends Hospital in Philadelphia in 1984 before working briefly with developmentally disabled adults. At the Perry Point VA Medical Center in Maryland, she has worked with psychiatric, geriatric, substance abuse, homeless, and physically disabled veteran populations for over 27 years.*

Developing Core Competencies for Behavioral Health

Melissa Bierman, HTR, BS, LEC

This session will define behavioral health and the history of horticulture and mental health. Core competencies related to client assessment strategies, program planning, and program evaluation will be outlined. Participants will be able to describe three key events regarding HT history and mental health and will also be able to summarize two mental health diagnoses and two appropriate interventions. Participants will describe the assessment protocol and integration in client programming and program evaluation.

***Melissa Bierman, HTR**, has a BS in horticulture and is currently working on her MBA in Healthcare Administration at Oregon Health and Sciences University. She has worked for Caremark Behavioral Health at Adventist Medical Center and Legacy Health in the acute care inpatient psychiatric units since 2005. She helped lead the design process for the Hope and Healing Garden at Adventist Medical Center and implemented the initial horticultural therapy programming. Her expertise is working in acute care psychiatric facilities with at-risk youth, adult, and geriatric patients in a wide variety of clinical settings. Melissa maintains therapeutic gardens at Legacy Health in Portland.*

Healing Gardens: From Concept to Eye Sparkling Detail

Virginia Burt, HTT, RLA, OALA, ASLA

With healing gardens being developed in healthcare across North America, this session will examine what it takes to move from "BIG idea" to detailed implementation and how "eye sparkling" techniques encourage meaningful projects. Participants will learn the development of communication of the "BIG idea" to its detail and identify relevant questions for inquiry with healthcare clients. Participants will also develop an understanding of the journey of navigating with multiple agendas: hospital administration, medical staff, and donors.

***Virginia Burt, ASLA, OALA**, is Principal at Visionscapes Landscape Architects, Inc. and designs gardens of meaning for residential and healthcare facilities. Well known for healing gardens, labyrinths, and sacred spaces since the inception of her ASLA award-winning firm in 1996, Virginia has over 28 years of experience. Clients, including university hospitals and The Gathering Place appreciate her focus on gardens that have heart and meaning. Virginia has lectured at many universities and over 150 conferences and has been published often.*

Design and Interpretation of Research Studies

Jane Saiers, PhD

This introduction to the principles and practices of experimental design and interpretation will provide participants a foundation for conducting horticultural therapy research and for accurately and critically interpreting others' research. Participants will be able to (1) describe the characteristics of a well-controlled, rigorously conducted research study and articulate criteria for research studies that constitute "best evidence" in healthcare practice, (2) identify common errors in the interpretation of results of research studies on therapeutic interventions, and (3) design a controlled research study that quantifies horticultural therapy outcomes.

Dr. Jane Saiers *received her doctorate in Psychology and Neuroscience from Princeton University and her BA in Psychology with a double major in English from Indiana University of Pennsylvania. She is completing requirements for the HTR credential and pursuing an Associate's Degree in Sustainable Agriculture at Central Carolina Community College. Her internship at the North Carolina Botanical Garden entailed planning and providing horticultural therapy services to populations with traumatic brain injury, substance use disorder, severe mental illness, dementia, and to the homeless. With her husband, she owns and operates Ramble Rill Farm, Inc., which provides vegetables, fruits, mushrooms, and herbs to local markets in and near Chapel Hill, North Carolina.*

HT and Disability - Starting a Program from the Ground Up

Susan Lear, BS

Learn how to create horticulture therapy programs for a broad spectrum of disabled individuals. Share in problem-solving and ideas which have proven successful with the disabled population. Participants will be able to effectively propose programs for students with disabilities to facilities in their areas as well as be able to create programs around the interests of their students. Participants will be able to adjust present programs to be more effective.

Susan Lear *has a BS in Health and Human Development from Montana State University and received a HT certificate from the Chicago Botanic Garden in 2010. Currently she manages two programs in Montana – one as Executive Director of "Befrienders," a small non-profit that matches community volunteers with senior citizens. Susan is also the Horticulture Program Director at Eagle Mount and Liberty Place, a home for individuals with traumatic brain injuries.*

Research on Gardening Activities Effects on the Brain

Masahiro Toyoda, PhD

Activation of the prefrontal cortex in gardening activities (e.g. seeding, thinning, planting, watering, weeding, and talking about familiar vegetables) will be shown by means of Near Infra Red Spectroscopy (NIRS). Participants will be able to understand: 1) the activity of the prefrontal cortex in gardening; 2) the importance of conversation in gardening; and 3) the differences of activation of the prefrontal cortex among the young, the aged, and those with Alzheimer's disease.

Masahiro Toyoda *is a Japanese horticultural therapist and researcher of horticultural therapy. Dr. Toyoda is an associate professor at the University of Hyogo and has been teaching a horticultural therapy certificate program in Awaji Landscape Planning and Horticulture Academy (ALPHA). This is the only academy in Japan that trains horticultural therapists authorized by the prefectural governor.*

Five Senses and HT

Kenshi Nishino, HTR, MD, PhD

People grow throughout their lives with the stimulation of the five senses and then during the aging process the sensitivity of the senses decreases. Nature can lessen the decline of the sensitivity and also revive the senses and human dignity. Participants will understand how the function of the five senses decrease in aging and will learn how there is a change of cerebral blood flow when nature stimulates the five senses. Participants will also learn how nature revives the five senses and help recover mental and cognitive function.

Kenshi Nishino, HTR*, earned his MD PhD from Nihon University Medical Department in Japan. He is president and CEO of the medical corporation Fraternity and is director of Nishino Hospital where he works with the elderly population who experience dementia.*

Growing Lives Ones Seed at a Time Enabling Garden Initiative

Laura DePrado, BS

Come hear about "Growing Lives One Seed at a Time" Enabling Garden initiative partnering Rotary

International and Rutgers University in five counties throughout Central New Jersey. Participants will learn a model (roadmap) to adapt to their own HT outreach efforts, learn how to partner with Rotary International and Land Grant University Cooperative Extension in their state, and learn how to include local professional nursery and greenhouse growers and industry organizations in their HT efforts.

***Laura DePrado**, a horticultural specialist and horticultural therapy practitioner, is the founder and owner of Final Touch Plantscaping, in Branchburg, NJ. She has worked with women in recovery from drug and alcohol addictions, five enabling garden pilot sites for people of all ages, and was instrumental in the passing of the 2013 Horticultural Therapy Resolution (February 2013) by the New Jersey Department of Agriculture. A presenter at AHTA's 2011 conference, she currently serves on the AHTA's conference committee work team.*

Career Exploration of Horticultural Therapy Professionals

Candice Shoemaker, HTR, PhD and Anna Shinjo, MS

This session will present the results of a national survey of AHTA members that explored the current conditions of the profession including demographic characteristics, challenges, and professional aptitude. Attendees will learn: (1) the current demographic make-up of the AHTA membership; (2) the similarities and differences between registered and non-registered AHTA members; and (3) the career aptitude of HT professionals.

***Dr. Candice Shoemaker** is Professor of Horticulture and Human Health at Kansas State University. She has taught both undergraduate and graduate courses in horticultural therapy and currently directs the award-winning online graduate certificate in horticultural therapy. Dr. Shoemaker's research focuses on gardening for health with a focus on the older adult and children. She has more than 30 publications in scientific journals and proceedings, including her award winning book "Interaction by Design: Bringing People and Plants Together for Health and Well-being." She has presented her work around the world.*

HT in the Social Work Profession Treatment Planning, Coding & Case Management

John Trauth, LISW-S

The goal of the session is to articulate HT treatment planning as it is related to the Counselor and Social Work Boards & HT goals when billing Medicaid. Participants will learn the social work and counseling research related to use with children, elderly, psychiatric clients, disabled, PDDs, women with substance abuse disorders, and self-care for the clinician. Participants will learn the practical use of horticulture therapy with clients in groups or individually to meet treatment goals and objectives identified by the Counselor and Social Work Board and Medicaid Standards. Participants will learn how to use the information in tangible and metaphoric applications to assist their clients to achieve clinical outcomes. The overarching model presented is related primarily towards a public health model catering to prevention (e.g. episodic mental health illness, physical lethargy, social isolation, and stagnation of learning), treatment (e.g. who, what, where, & how), and maintenance (self-sufficiency).

***John Trauth, LISW-S**, received his MSW from University of Kentucky and has worked in a number of human services areas including substance abuse, homelessness, and mental health. In his travels to Nicaragua, he introduced permaculture techniques. He also worked at the Clermont Recovery Center in Appalachia, Ohio with behaviorally challenged adolescents introducing therapy in the garden setting. Mr. Trauth has presented at the NCACES conference and at the University of Cincinnati Ecological Counseling Conference.*

HT Therapy in Adult Inpatient Mental Health Services

Cindy Peterson, CTRS

This session is an introduction to the program along with examples of services. Participants will learn about what horticultural therapy interventions have been successful with people with severe persistent mental illness.

***Cindy Petersen, CTRS** has a BA in Park Recreation and Leisure Studies and a graduate certificate in Integrative Therapies and Healing Practices both from the University of Minnesota. She is a part-time staff member at the Minnesota Landscape Arboretum's Nature-Based Therapeutic Services. She also coordinates the HT program at the Abbott Northwestern Hospital for acute inpatient psychiatric patients.*

Forest Amenities and Human Health Promotion in Japan

Iwao Uehara, PhD

This session introduces forest & tree amenities for

promoting human health in Japan. Forest & tree amenities have certain possibility to ease stress in the modern lives. Participants will be able to understand the healing effects of forests & trees. They will also learn how to utilize those amenities and the big possibilities of them.

***Iwao Uehara**, has a PhD in agricultural science from Gifu University in Japan, where he has taught horticultural therapy, forest therapy, and tree physiology. His research includes using tree environments with those with developmental and cognitive limitations as well as studying the antivirus effects of tree fragrance. Dr. Uehara is an advocate for bringing forest and horticultural therapy to rural hospitals, social service centers, and schools.*

HT plus Art Therapy: An Intervention
Miho Kataoka, HTR, MS
Through this case study participants will be able to see outcomes of a program that is a conjunction of horticultural therapy and art activity. Outcomes were measured by qualitative data and quantitative data. The qualitative data came from daily observation and the quantitative data came from vocational assessment data taken at the beginning of the program and at the end of the program. The qualitative data showed how the client's words and facial expression changed. The qualitative data showed the improvement the vocational ability.

***Miho Kataoka, HTR**, has a BS and MS in horticultural therapy from Kansas State University. She worked as a horticultural therapist at Mountain Valley Developmental Services at Glenwood Springs, CO. until Dec 2011. Miho returned to Japan where she is working as a horticultural therapist at a prefectural park at Osaka since 2012.*

Hands On Activities Workshop
MaryAnne McMillan, HTR and Jean D'Amore, HTR
Ever been stuck for an activity to work on with your clients? It's raining out and your plans were to work outdoors and now you need a plan B? Or just looking for something different to try with your clients? This just might be the workshop for you. Participants in this hands on workshop will complete two or three activities that can be utilized with their client base. Additional activities to try on your own will also be supplied. Goals and objectives examples will also be provided.

***MaryAnne McMillan, HTR**, attended Cook College, Rutgers University. She graduated from the NYBG Horticultural Therapy program in 2001. She has worked for Allies, Inc for five years and is the HTR and Project Manager for Allies 'Project Grow,' a horticultural therapy and vocational training program for the developmentally disabled in collaboration with Allies, Inc. and Mercer County Community College. MaryAnne has also been employed at Rutgers Gardens, Rutgers University for over 20 years, where she oversees over 100 volunteers, including corporate and fraternal groups.*

***Jean D'Amore, HTR**, is a 2009 graduate of Douglass College at Rutgers University and she attended horticultural therapy classes at Rutgers Cook College. Jean has worked for Allies, Inc. at a group home with adults who have developmental disabilities for almost two years and for Rutgers University Behavioral Health Center with individuals who have mental health and substance abuse issues.*

Networking Roundtables by Population
Facilitated by Patty Cassidy, HTR
***Patty Cassidy, HTR**, holds a BS in Elementary Education and a MA in Counseling Psychology. She has worked as an HT contractor in Portland with frail elders and those with memory disorders since 2007. Patty is the President of the Friends of the Portland Memory Garden and is author of The Illustrated Practical Guide to Gardening for Seniors. She is on the AHTA Board of Directors and is the lead person for the membership work team.*

Book Review: *Dementia Green Care Handbook of Therapeutic Design and Practice*

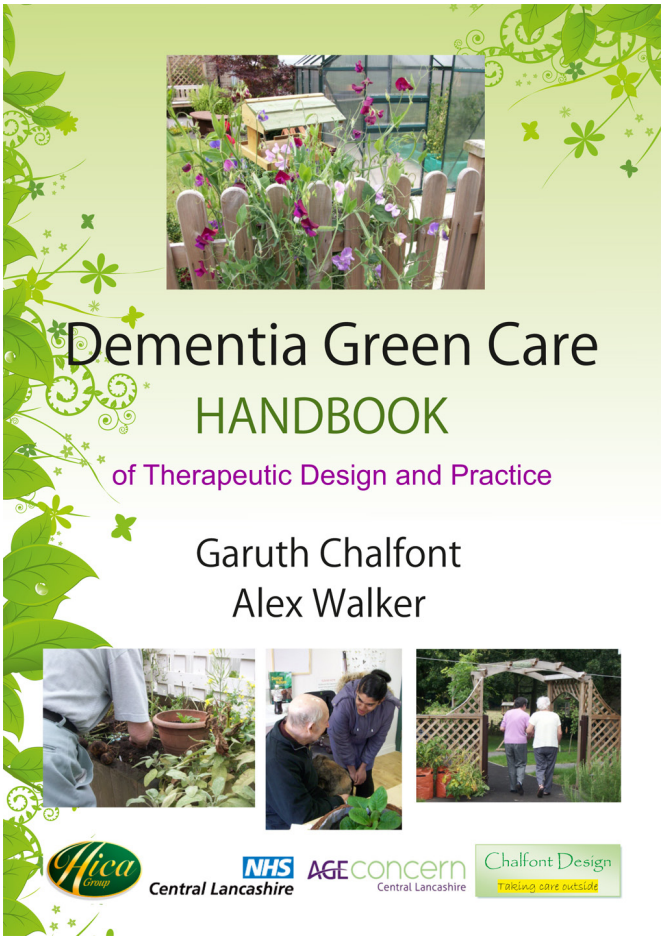
Garuth Chalfont & Alex Walker. Mesa, AZ: Safehouse Books. 2013. 50 pp. ISBN-978-0-9744912-1-9

Reviewed by Lesley Fleming, MA, HTR

With the availability of a free download of *Dementia Green Care Handbook of Therapeutic Design and Practice*, there are few reasons to not read, skim, or ponder some of the concepts in Chalfont and Walker's compact book. Although the book is intended for administrators and staff of dementia care facilities, many other health professionals can benefit from these green care ideas for people with dementia, including horticultural therapy practitioners, nurses, landscape architects, and recreation therapists.

Despite the distinctly United Kingdom (UK) tone, North American health professionals will easily relate to the book given the increasing level of interest and demand for services for dementia populations. The authors' underlying foundation is the UK's 2009 National Dementia Strategy that states people should be "living well with dementia" (Department of Health, 2009). The authors focus on *abilities* of those with dementia, rather than the more typical medical and behavioral focus of deficits and declining abilities. Contact with the natural world is presented as integral to living well with dementia. Green care, the European term for non-traditional healthcare interventions that include farming, gardening, and animal husbandry, is the link between dementia care services and the natural world. While green care is not a new concept, *Dementia Green Care Handbook of Therapeutic Design and Practice* provides a comprehensive outline for actual implementation to provide or expand interactions with nature within a healthcare setting.

Chalfont and Walker talk about the importance of both social engagement and nature engagement in dementia green care and how the overlap of these two things is beneficial because it provides multi-dimensional therapeutic opportunities including sensory stimulation, purpose and meaning, agility and balance, appetite, and mood and sleep patterns. They then introduce the concept of the *Third Thing*, referring to the focus on an object during nature/social engagement that enhances opportunities for communication. They report that if that third thing is something in the garden then the experience is further improved for the person with dementia. Discussion of these potential benefits piques readers' interest, but the book's empirical data substantiating these health improvements is limited. Pollock & Marshall's 2012 *Designing Outdoor Spaces for People with Dementia* is identified as a source for more detailed empirical information.



As the title suggests, this book can be used as a step-by-step guide for facilities interested in delivering green care for dementia populations. The handbook provides definitions, staff training suggestions, social and therapeutic horticulture activities, and garden design ideas. Two types of dementia care facilities are referenced and demonstrate the versatility of the book's green care ideas: Charnley Ford, an enhanced dementia day support facility in Bamber Bridge and the Lodge in the Buckshaw Retirement Village, a residential facility in Chorley, both of which are located in Central Lancashire, England.

Several of the authors' concepts are thought provoking. Chalfont and Walker use the term *distressed behavior* to refer to behavior of people with dementia. Not yet a standard diagnostic term, their explanation and use of this definition seems appropriate. As they explain, people diagnosed with dementia are often referred to as challenging; a challenge to family members or other caregivers. Taking the perspective that this behavior

is often a result of distress, the authors then consider therapeutic interventions such as green care or access to the outdoors to aid in reducing that distress. This is a significant shift in mindset, focused less on controlling behavior and more on removing stress. Using nature to calm, gently stimulate, or provide joyful experience is the overriding praxis of Chalfont and Walker's book.

Dementia Green Care Handbook of Therapeutic Design and Practice presents another concept worth thought: *risk-free vs. risk-assumed gardens*. Based on their research at the two dementia care facilities mentioned above, the authors state that many dementia facility gardens are designed so that all spaces are safe for all users. They contend that this renders many gardens "therapeutically useless" and limits their ability to stimulate.

Designing gardens to more finely correlate appropriate types of sensory, intellectual, physical, and social stimulation with the degree, deficits, and abilities of garden users with dementia, the authors propose risk-free and risk-assumed gardens. Risk-free gardens would be used independently by those with dementia while fully visible by staff. Risk-assumed gardens would be used *with* staff or family members and enriched to provide greater stimulation using swings, ponds, or adult play equipment.

These garden classifications suggest design distinctions that could lead to significant landscape design implications in this developing area but ultimately must reflect evidence-based research on specific types of gardens for people with varying degrees of dementia. Their terminology - *risk-free* and *risk assumed* gardens - may prove difficult for Americans who, in their litigious culture, are challenged to think of any environment for people with dementia as risk-free.

Chalfont and Walker should be applauded for providing free access to their handbook. Dissemination of information may have been a stipulation for the government funding of their work, but regardless, the strength of their work is in presenting green care practices in a format useful to both those new to green care as well as those already working with nature as a healing medium.

Department of Health, UK. (2009). *Living Well with Dementia: A National Dementia Strategy*. London: DH Publications. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/168220/dh_094051.pdf

Pollock, A., & Marshall, M. (Eds.). (2012). *Designing Outdoor Spaces for People with Dementia*. Stirling, Scotland: Hammond Press.

Free downloads of *Dementia Green Care Handbook of Therapeutic Design and Practice* are available from the following websites at the time of printing:

Alzheimer's Australia Dementia Enabling Environments
http://www.enablingenvironments.com.au/Resources/ReadingList.aspx

United Kingdom Housing Learning and Improvement Network (LIN)
http://www.housinglin.org.uk/Topics/browse/HousingandDementia/Design/?parent=5091&child=8837

Author Guidelines

You are invited to submit manuscripts for consideration for publication in the Journal of Therapeutic Horticulture. Manuscripts may include research projects, case studies, program and services descriptions, therapeutic practice descriptions, therapeutic horticulture philosophies, therapeutic design project descriptions, relevant book reviews, and other related topics.

Manuscripts should be submitted to one of the following sections:

Research
Includes manuscripts of research reports and case studies that contain research components such as a research question, objective, literature review, data collection and analysis, and results and conclusion.

Practice Forum
Includes manuscripts describing horticultural therapy and related programs, case reports, teaching techniques and tools, and other related items.

Therapeutic Landscape and Garden Design
Includes manuscripts on the design, history, and/or theory of gardens and other landscapes as they relate to the field of horticultural therapy.

Issues in the Profession
Includes manuscripts on such topics as education and training, professional or organizational issues, legislative issues, or other related areas.

Horticultural Therapy and the Community
Includes manuscripts on the interaction of horticultural therapy issues and the community at large.

Upon Reflection
Includes thoughts on the more philosophical, reflective, and/or spiritual aspects of therapeutic horticulture.

Book Reviews
Includes reviews of book that have relevance to the broad area of therapeutic horticulture. Contact editor for book review guidelines.

Manuscripts
Manuscript submissions to the JTH should be sent as an e-mail attachment in Microsoft Word. Manuscripts must represent original material that has not been previously published or that is not under consideration for publication elsewhere. In addition, authors are required to submit an abstract of the manuscript and a brief biography. If the author does not have mastery of the English language, the manuscript must be professionally translated before being submitted.

Authors are asked to follow AHTA's published definitions when describing horticultural therapy and related programs in their manuscripts (see below). References should follow the author-date format. The authority for style is the Publication Manual of the American Psychological Association. For more information on style and formatting, please contact the editor-in-chief.

Manuscripts must be accompanied by a cover letter indicating that the work is intended for publication and to which section it is being submitted. Please also submit the names and contact information of 2-3 individuals qualified to review the manuscript. Graphics and photographic images are acceptable and encouraged if relevant. Authors whose manuscripts are accepted for publication in the JTH will be required to submit a rights assignment form. Manuscripts accepted for publication will undergo an editing process and be forwarded to the author for final clearance before publication.

The editorial board will consider quality, practicality, timeliness, and relevance to the area of therapeutic horticulture.

Send cover letter, manuscript, abstract, brief biography, and contact information for qualified reviewers to:

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leahdiehl@ufl.edu
(352) 514-5802

Appendix I

American Horticultural Therapy Association Definitions and Positions

The following is an excerpt from the AHTA Definitions & Positions paper, which was published in 2007. The full paper can be accessed on the AHTA website at http://ahta.org/sites/default/files/DefinitionsandPositions.pdf

To increase understanding of the profession, the American Horticultural Therapy Association (AHTA) has put together the following outline to define the terms recognized by AHTA that are associated with people-plant relationships and to provide additional information on horticultural therapy.

Types of Programs

Horticultural Therapy
Horticultural therapy is the engagement of a client in horticultural activities facilitated by a trained therapist to achieve specific and documented treatment goals. AHTA believes that horticultural therapy is an active process which occurs in the context of an established treatment plan where the process itself is considered the therapeutic activity rather than the end product. Horticultural therapy programs can be found in a wide variety of healthcare, rehabilitative, and residential settings.

Therapeutic Horticulture
Therapeutic horticulture is a process that uses plants and plant-related activities through which participants strive to improve their well-being through active or passive involvement. In a therapeutic horticulture program, goals are not clinically defined and documented but the leader will have training in the use of horticulture as a medium for human well-being. This type of program may be found in a wide variety of healthcare, rehabilitative, and residential settings.

Social Horticulture
Social horticulture, sometimes referred to as community horticulture, is a leisure or recreational activity related to plants and gardening. No treatment goals are defined, no therapist is present, and the focus is on social interaction and horticulture activities. A typical community garden or garden club is a good example of a social horticulture setting.

Vocational Horticulture
A vocational horticulture program, which is often a major component of a horticultural therapy program, focuses on providing training that enables individuals to work in the horticulture industry professionally, either independently or semi-independently. These individuals may or may not have some type of disability. Vocational horticultural programs may be found in schools, residential facilities, or rehabilitation facilities, among others.

AHTA Membership Application

You're Invited to Join AHTA!

The American Horticultural Therapy Association (AHTA) is helping horticultural therapy (HT) gain increasing acceptance as a unique and dynamic human service program. AHTA is the only national organization concerned with promotion and development of HT programming. Join more than 900 individuals and organizations located across the US, Canada, Japan, and beyond who are members of this association. AHTA is a 501(c)3 nonprofit organization and your membership dues and donations are tax deductible.

Benefit

Associate Members receive the quarterly news magazine, the Journal of Therapeutic Horticulture, reduced annual conference registration fees, voting privileges, and eligibility to be considered for election to the AHTA board of directors.

Student Members receive the quaterly news magazine, the Journal of Therapeutic Horticulture and reduced annual conference registration fees. Student must submit a current transcript or letter from faculty advisor verifying full-time student status to be eligible for discounted dues.

Affiliate and Organizational Members receive the quarterly news magazine and the Journal of Therapeutic Horticulture. Additionally, Affiliate and Organizational members receive a reduced annual conference registration fee*.

**This benefit applies to one individual per Affiliate and Organizational member. Please include individual's name at the time dues are submitted.*

Membership Dues Please circle the desired membership level. Dues effective 2013; all dues are in US dollars. See the AHTA website for more information (www.ahta.org).

	US	Canada*	Others*
Affiliate	$225	$250	$235
Associate	$145	$170	$185
Organizational	$300	$350	$400
Student**	$55	$80	$95

* All amounts are in U.S. dollars.

** Students must include a letter from an advisor or a copy of a current transcript documenting full-time student status.

Please Print

Title _____

First Name _____

Middle Initital _____

Last Name _____

Address _____

City _____

State _____

Zip _____

Country _____

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Fax _____

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Organization *(if applicable)* _____

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