The Role of Visitor's Positive Emotions on Satisfaction and Loyalty with the Perception of Perceived Restorative Environment of Healing Garden

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ABSTRACT

Background and objective: The purpose of this study is to investigate the effects of visitors' positive emotions on satisfaction and loyalty with the perception of restorative environment of a healing garden created in an urban agriculture expo.

Methods: The psychological indicators to the images of the healing garden were analyzed by the visitors' demographic variables and the three factors of plant cultivation activity level: plant cultivation experience, plant preference, and plant-related event.

Results: Between age groups and occupational groups, significant differences were found statistically. The Perceived Restorativeness Scale (PRS) showed significant differences between age groups in repose, fascination and legibility. The Positive Affect & Negative Affect Schedule (PANAS) showed statistically significant differences between age groups in positive emotions. In addition, we investigated the correlation between the PANAS and the three factors of plant cultivation experience level, the four factors of the PRS, satisfaction and loyalty. The three factors of plant cultivation experience level, the four factors of the PRS, satisfaction and loyalty showed a positive correlation with positive emotions and were inversely correlated with negative emotions significantly. Multiple regression analysis with dummy variables was conducted to examine the effects of plant cultivation activity level, attention restoration, and the PANAS on healing garden visitors' satisfaction and loyalty. As a result, among the four factors of the PRS, fascination and positive affectivity were significant variables that affect healing garden visitors' satisfaction and loyalty.

Conclusion: The results indicated that the higher the attention restoration of visitors due to the fascination of the healing garden and the higher their positive affectivity and the more they have plant-related memories, the higher their impact on healing garden visitors' satisfaction and loyalty. Therefore, fascinating natural environments or greenery landscapes like healing gardens where people can contact plants would reduce negative emotions such as anger and sadness but to increase positive emotions such as pleasure, joy and satisfaction.

Keywords: fascination, legibility, PANAS, plant cultivation activity level, PRS

Introduction

People living in urban areas in modern times show a stronger desire to return to nature, a restorative environment for recovering from stress that they experience in daily life (Herman, 1997). While the natural environment in

the past simply provided the foundation for living and was a place where people obtained products (Yoo et al., 2013), it is in modern times an essential element for physical and psychological health as a healing space (Lopez-Mosquera and Sanchez, 2013). Meanwhile, after rapid urbanization, studies on the importance of mental healing for urban

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dwellers and the restorative effects of the natural environment have been highlighted. The history of using agriculture for healing goes back to the Middle Ages, and it started to be specialized in the 1950s (Simson and Straus, 1998). Healing gardens, one of the concepts of natural healing, can be an exemplary restorative environment that infuses energy into the body and vitality to the mind and induces rhythms that restore the weak body and mind to health (Gerlach-Spriggs et al., 1998; Kim et al., 2008). In particular, mental stability that gardens give has already been known long time ago when Christ lived (Simson and Straus, 1998). Attention restoration theory (ART) suggested by Kaplan and Kaplan (1989) as a restorative environment divided attention into directed attention and involuntary attention, and defined directed attention as the process of suppressing unnecessary stimulation and concentrating on necessary stimulation in order to effectively lead a daily life. When a certain environment has many fascinating elements, people's attention is involuntarily drawn to them without paying a special attention, which is involuntary attention. In this case, the environment can be recognized as a restorative environment that helps people recover from mental stress in the environment as they do not need to pay a special attention (Kang et al., 2013; Kaplan and Kaplan, 1989).

In particular, the more leaves of plants, a fascinating element that can be obtained from healing gardens, people can see, the more their directed attention is restored and thus the more positive impact on emotions can be obtained (Lee, 2007). In addition, an environment with a proper level of fascination induces significant healing effects (Lee, 2006). Humans have an intrinsic desire to contact nature and keep nature closer and anyone has homing instinct to go back to nature (Wilson, 1984). Therefore, it is necessary to develop various programs through which people can easily experience the natural environment in daily life (Lee, 2007).

Since the local autonomy system was introduced in 1995 in Korea, many local governments have hosted exhibitions as an effort to vitalize local economy (Lee et al., 2011). The Korea Agriculture Show has been hosted annually since 2002, and was expanded into an international agriculture show in 2012, providing people with information on cutting-edge agricultural technology, high value-added

agriculture, health management and healing programs (Yun, 2012; Lee, 2018). Experiences of agro-healing or healing gardens through these events can provide visitors with information on the effects of nature as a restorative environment including attention restoration and psychological restoration (Kaplan and Kaplan, 1989). Therefore, gardens, as a space for healing experiences called a series of processes of using various agricultural activities for treatment or health promotion (Rural Development Administration [RDA], 2016), can provide visitors with opportunities to improve their understanding of healing and those who are exhausted from urban life with opportunities to experience healing gardens in nature no matter how small the gardens are. Against this backdrop, this study analyzed the effects of the natural environment on psychological restoration in a healing garden that has elements of the natural environment and the effects of the positive emotions on visitors' satisfaction and loyalty, and suggested useful data for the spread of healing gardens by identifying the psychological effects of healing gardens based on the results of analysis.

Research Methods

Socio-demographic background of visitors

This study aimed to examine the effects of visitors' positive emotions according to the perceived restorative environment of a healing garden created in an exhibition. To collect data on visitors' perceived restorative environment of the healing garden, a healing garden (7,500 mm x 5,000 mm) was created and a questionnaire survey was conducted on 302 visitors (Fig. 1). Excluding 17 questionnaire sheets with insufficient answers, a total of 285 questionnaire sheets were analyzed. The number of females and males was 157 (55.1%) and 128 (44.9%) respectively and the share of those in their 50s was highest (26.1%), followed by the 60s or older (22.9%), the 40s (20.1%), the 20s (13.0%), the 30s (12.3%), and younger than 20 (5.6%). The share of those who graduated (or were attending) college was highest (55.8 %), followed by those who graduated (or were attending) high school (20.0%), those who graduated (or were attending) graduate school (17.5%), and

Fig. 1. Healing garden used in the survey. (A) Healing garden; (B) Green indoor garden; (C) Fragrance garden; (D) Color garden.

Table 1. Characteristic of survey respondents (N = 285)

Variable	Category	Frequency	Percent (%)
Gender	Male	128	44.9
	Female	157	55.1
Age	Under 20	16	5.6
	20s	37	13.0
	30s	35	12.3
	40s	57	20.1
	50s	74	26.1
	60s or over	65	22.9
Education	Under high school	19	6.7
	High school	57	20.0
	University	159	55.8
	Graduate school	50	17.5
Monthly income (KRW)	Less than 1,000,000	63	23.2
	1,010,000-2,000,000	40	14.8
	2,010,000-3,000,000	58	21.4
	3,010,000-4,000,000	63	23.2
	More than 4,010,000	47	17.3
Occupation	Housewife	65	23.0
	Self-employed	18	6.4
	Professional	49	17.4
	Student	40	14.2
	Employee	56	19.9
	Agriculture, forestry, or fishery	12	4.3
	Others	42	14.9

those whose academic background was lower than high school (6.7%). Those whose average monthly income was 1 million won or lower and 3.01-4 million won accounted for the highest share (23.2%) respectively, followed by 2.01-3 million won (21.4%), 4 million won or more (17.3%), and 1.01-2 million won (14.8%). In terms of occupation, the share of those who were a housewife was highest (23.0%), followed by employees (19.9%), professionals (17.4%),

others (14.9%), students (14.2%), those in the agriculture, forestry and fishery industry (4.3%), and the self-employed (6.4%; Table 1).

Analysis of healing garden visitors' plant cultivation activity level

To measure healing garden visitors' plant cultivation activity level, this study utilized the scale that was developed

by the Rural Development Administration (RDA, 2017) to survey the level of exposure to or accumulated experience of plant cultivation activities based on the frequency and attitude of experiencing plants such as growing and caring plants in daily life. The plant cultivation activity scale is composed of a total of 12 questions including A-D about plant cultivation experience, E-H about plant preference, and I-L about plant-related memories or events, and the detailed information on each question is as follows: four questions about plant cultivation experience (A'I have many experiences of cultivating plants': B'I actively participate in activities of cultivating plants': C'I always grow plants': D'I think growing plants in daily life is very important'); four questions about plant preference (E'I like any plants unconditionally': F'I have many plants in my house': G'I am very interested in plants in my surroundings': H'I frequently buy plants from flower shops (flower gardens, farms, etc.); and four questions about plant-related events (I'I feel better whenever I spot the plants I like': J'Whenever I think about the plants I like, they recall old memories': K'The motivation behind why I came to like plants still affects my life': L'The experience of growing plants still affects my life'). A 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) was used (Jang et al., 2018, 2019; RDA, 2017) and the Cronbach's α of the plant cultivation activity scale used in this study was .860 for plant cultivation experience, .828 for plant preference, and .909 for plant-related events.

Analysis of healing garden visitors' psychological characteristics

The Korean-version Perceived Restorativeness Scale (PRS) and Positive and Negative Affect Schedule (PANAS) were used as a tool for assessing psychological characteristics.

Korean-version Perceived Restorativeness Scale

The Perceived Restorativeness Scale (PRS) developed initially was comprised of 16 questions that utilized the four elements (being away, extent, fascination, compatibility) suggested in Kaplan and Kaplan (1989)'s attention restoration theory (ART), and was utilized in measuring the level of perception. Later, Hartig et al. (1997) devel-

oped the PRS comprised of 26 questions about the four elements (repose, fascination, coherence, legibility) and Lee and Hyun (2003a) translated it into Korean. In this study, a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used. The PRS is a scale used to measure the perceived psychological restoration that people experience when they are in a certain environment and its Cronbach's α was .950.

Korean version of Positive and Negative Affect Schedule

The Positive and Negative Affect Schedule (PANAS) means mental health as the emotions of humans themselves (Diener, 1984), and is widely used in studies on self-report emotions based on positive and negative affectivity. To measure positive and negative affectivity through the PANAS developed by Watson et al. (1988), the version validated by Park and Lee (2016) was used in this study. The Korean-version PANAS was comprised of a total of 20 questions, 10 on positive affectivity and 10 on negative affectivity, and each question was assessed using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's α was .914 for positive affectivity and .841 for negative affectivity.

Visitors' satisfaction and loyalty

Since there was no issue found in reliability and validity in this study, the three questions revised and used by Lee (2016) in a questionnaire survey on visitors' satisfaction with Sucheon Bay National Garden were used and assessed using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). In terms of loyalty, the scale of three questions used by Gremler (1995) to measure customers' loyalty was revised according to the situation of the healing garden visitors in this study and was assessed using a 5 point Likert scale (1 = strongly disagree, 5 = strongly agree; Zeisel, 1981). The Cronbach's α was .939 for satisfaction and .934 for loyalty.

Statistical analysis

Statistical analysis was conducted using IBM SPSS ver. 25.0. The internal consistency of the measurement tool was

analyzed by calculating Cronbach's α . One-way ANOVA was conducted on plant cultivation activity level, the Korean-version Perceived Restorativeness Scale (PRS; Lee, 2006; Lee and Hyun, 2003a) and the Korean-version Positive and Negative Affect Schedule (PANAS; Park and Lee, 2016). Tukey's multiple range test was performed as a post-hoc test. The correlation between key variables was analyzed using Pearson's correlation analysis, and the demographic characteristics of visitors were analyzed using frequency analysis. In addition, regression analysis was performed on plant cultivation activity level, the Korean-version PRS and the Korean-version PANAS and the effects of demographic variables on satisfaction and loyalty. Since the general characteristics of visitors including gender, age group, academic background, occupation and monthly income were surveyed through a questionnaire survey as a nominal scale, they were converted into dummy variables for regression analysis.

Results and Discussion

Motivation for use and purpose of visits

The motivation of visitors for using and their purpose of visiting the healing garden created in an agriculture expo were surveyed through multiple response analysis and those

who heard about the opening of the agriculture expo from friends/relatives accounted for the highest share (28.3%), followed by others (18.8%), TV/radio and Internet (17.3% respectively), advertisement (8.5%), outdoor advertising (5.9%), and newspaper (3.9%). In addition, the share of viewing in terms of the purpose of visits was highest (38.6%), followed by experience (20.7%), information/data collection (20.1%), family outing (13.7%), group research (3.6%), and others (3.3%; Table 2). These results were similar to the results of Yun (2012) and Ahn (2014) that visitors mostly became aware of the opening of the expo through recommendations from the people they know, and the results of Jang et al. (2019) that the main purpose of visiting the agro-healing experience hall at the Agricultural Technology Exhibition was viewing, followed by experience and information/data collection. Given that, it will be very important to select a PR medium suitable for urban agriculture expos and agricultural technology exhibitions, to provide visitors with attractions to look around and programs to experience, and to offer accurate and useful information and materials.

Plant cultivation activity level of healing garden visitors

The plant cultivation activity level of healing garden visitors was surveyed and among the three factors the score

Table 2. Sources of motivation and purpose of visit (N = 285)

Variable	Category	Frequency	Percent (%)
Information sources	TV/Radio	53	17.3
	Newspaper	12	3.9
	Internet	53	17.3
	Outdoor advertising	18	5.9
	Friend/Relatives	87	28.3
	Advertisement	26	8.5
	Others	58	18.8
Purpose of visit	Experience	68	20.7
	Viewing	127	38.6
	Information gathering	66	20.1
	Family visit	45	13.7
	Group research	12	3.6
	Others	11	3.3

of plant-related events was highest ($M = 5.11$, $SD = 1.42$), followed by plant cultivation experience ($M = 4.87$, $SD = 1.37$) and plant preference ($M = 4.85$, $SD = 1.32$; data not shown). Visitors' experience and perception about plants by age group were surveyed (Table 3). In terms of plant cultivation experience, differences between those in their 20s and those younger than 20 or those in their 50s or 60s or older, and between those in their 30s or 40s and those younger than 20 or those in their 50s or older were found to be significant ($p < .001$), and there were also significant differences between those in their 20s and those in their 50s or 60s or older in terms of plant preference. In addition, there were statistically significant differences between those in their 20s or those younger than 20 and those in their 50s or 60s or older in terms of plant-related events ($p < .001$). These results indicate that the plants-related experience or perception of visitors in their 50s and 60s or older tends to be higher than young visitors as they have more experiences, memories and events related to cultivating plants and a higher preference to growing plants. In terms of plant preference and plant-related events, however, the score of those younger than 20 was relatively low compared to those in their 50s and 60s or older, but the reason why those younger than 20 showed a high score

in plant cultivation experience seems that the number of horticultural activities utilizing plants in school or at home has recently increased. Except the result that those younger than 20 showed a high score only in plant cultivation experience, the average score of all the three factors of plant cultivation activity level tended to be lower, as the age of visitors decreased, while the average score tended to be higher as the age of visitors increased. Visitors' experience and perception of plants were also analyzed by academic background and all the three questions about plant cultivation activity level showed no statistically significant result (data not shown). In terms of plant cultivation activity level according to occupation, those in the agriculture, forestry and fishery industry showed the highest score in all the three factors including plant cultivation experience, plant preference and plant-related events compare to other occupation groups and the differences were statistically significant (Table 4). These results were similar to the results of Jang et al. (2019) that the average plant cultivation activity level of visitors younger than 20 who visited the 2018 Changwon Agricultural Technology Exhibition was low, while that of those in their 50s and 60s or older was high. The study found no statistically significant difference between academic backgrounds.

Table 3. Differences in plant-related experience and perception by age of healing garden visitors

V ^z	Under 20	20s	30s	40s	50s	60s or over	F	p
A	5.22±1.30c	4.19±1.44a	4.37±1.10ab	4.71±1.20ab	5.11±1.36c	5.25±1.41c	4.974	.001***
B	4.44±0.79ab	4.25±1.21a	4.29±1.09ab	4.69±1.14abc	5.13±1.33bc	5.39±1.45c	6.730	.001***
C	4.58±1.14a	4.30±1.37a	4.71±1.43ab	5.04±1.20ab	5.52±1.63c	5.52±1.63c	6.214	.001***

Note. Values are mean ± standard deviation (N = 285). Mean separation within rows by Tukey's multiple range test, 5% level.

^zV= Variance; A = Plant growing experience; B = Plant preference; C = Plant-related events.

*** $p \leq .001$ by one way ANOVA.

Table 4. Differences in plant-related experience and perception by occupation of healing garden visitors

V ^z	Housewife	Self-employed	Professional	Student	Employee	Agriculture, forestry, or fishery	Others	F	p
A	4.75±1.37a	4.92±1.60a	4.80±1.52a	4.98±1.25a	4.41±1.30a	6.10±1.02b	5.22±1.14ab	3.391	.003**
B	4.95±1.53a	5.20±1.46a	4.84±1.38a	4.54±1.02a	4.46±1.24a	5.33±0.83b	5.17±1.16a	2.220	.041*
C	5.25±1.45ab	5.56±1.65ab	4.94±1.53ab	4.71±1.17a	4.84±1.32ab	5.85±0.98b	5.35±1.42ab	2.211	.042*

Note. Values are mean ± standard deviation (N = 285). Mean separation within rows by Tukey's multiple range test, 5% level.

^zV= Variance; A = Plant growing experience; B = Plant preference; C = Plant-related events.

* $p < .05$. ** $p < .01$ by one way ANOVA.

Analysis of psychological characteristics of healing garden visitors

Korean-version Perceived Restorativeness Scale

Differences in the four elements (repose, fascination, coherence, legibility) of the Perceived Restorativeness Scale (PRS) between age groups were analyzed (Table 5), and differences between the age groups of healing garden visitors in 'repose,' 'fascination' and 'legibility' were statistically significant. Specifically, differences in 'repose' between those in their 20s or 30s and those in their 60s or older, differences in 'fascination' between those in their 20s and those in their 60s or older and differences in 'legibility' between those in their 20s-40s and those younger than 20 or those in their 60s or older were found to be statistically significant. In particular, visitors in their 60s or older were found to feel 'repose' or 'fascination' in the healing garden most strongly, and visitors younger than 20 were found to feel 'legibility' most strongly, which was statistically significant. As such, the reason why those younger than 20 showed the highest score in 'legibility' comprised of 'I think I can easily picture the map of the healing garden in my head,' 'It is easy to find the way

here by my self' and 'The structure of this place is easy to understand' seems to be that they are more intuitive than other age groups. Compared to the results of Jang et al. (2019) that visitors in their 60s or older who experienced agro-healing at the Cheongju Korea Urban Agriculture Fair felt repose and fascination less and legibility more, there was a difference from the results of this study that those of the silver generation in their 60s or older felt repose and fascination more strongly in the healing garden where they could see nature and feel its color and scent instead of agro-healing experience. This highlights the importance of composing content suitable for each age group. In addition, differences in the four elements of the PRS between different academic backgrounds and monthly income levels, and there was no statistically significant difference between the groups of healing garden visitors (data not shown). In terms of occupation, however, there was a statistically significant difference in 'coherence' between the self-employed group and the group of others (Table 6).

Korean-version Positive and Negative Affect Schedule

Differences between the positive and negative affectivity

Table 5. Differences in perceived restorativeness elements by age of healing garden visitors

V ^z	Under 20	20s	30s	40s	50s	60s or over	F	p
A	3.46±0.87abc	3.07±0.74a	3.20±0.89ab	3.64±0.71bc	3.58±0.85abc	3.74±0.77c	4.785	.001 ^{***}
B	3.55±0.90ab	3.25±0.83a	3.27±0.86ab	3.66±0.71ab	3.69±0.89ab	3.79±0.75b	3.557	.004 ^{**}
C	3.67±0.83a	3.53±0.57a	3.46±0.65a	3.64±0.56a	3.61±0.62a	3.62±0.69a	0.521	.761 ^{NS}
D	3.65±0.94b	2.96±0.99a	2.64±0.83a	3.02±0.76a	3.10±1.04ab	3.25±0.87b	3.499	.004 ^{**}

Note. Values are mean ± standard deviation (N = 285). Mean separation within rows by Tukey's multiple range test, 5% level.

^zV= Variance; A = Repose; B = Fascination; C = Coherence; D = Legibility.

^{NS}Non-significant, ^{**}*p* < .01, ^{***}*p* ≤ .001 by one way ANOVA.

Table 6. Differences in perceived restorativeness elements by occupation of healing garden visitors

V ^z	Housewife	Self-employed	Professional	Student	Employee	Agriculture, forestry, or fishery	Others	F	p
A	3.49±0.83a	3.54±0.89a	3.58±0.79a	3.36±0.82a	3.42±0.87a	3.46±0.70a	3.69±0.77a	0.757	.604 ^{NS}
B	3.55±0.78a	3.38±0.87a	3.63±0.78a	3.47±0.87a	3.56±0.89a	3.57±0.56a	3.81±0.81a	0.916	.484 ^{NS}
C	3.50±0.61ab	3.33±0.62a	3.58±0.62ab	3.61±0.66ab	3.59±0.57ab	3.81±0.50ab	3.82±0.67b	2.201	.043 [*]
D	3.07±0.97a	2.82±0.99a	3.09±0.87a	3.28±1.00a	2.96±0.79a	3.00±1.05a	3.13±0.97a	0.738	.620 ^{NS}

Note. Values are mean ± standard deviation (N = 285). Mean separation within rows by Tukey's multiple range test, 5% level.

^zV= Variance; A = Repose; B = Fascination; C = Coherence; D = Legibility.

^{NS}Non-significant, ^{*}*p* < .05 by one way ANOVA.

of healing garden visitors were analyzed, and the total score of positive and negative affectivity caused by the healing garden was 31.77(SD = 8.51) and 12.30 (SD = 4.20) respectively. These results were similar to the results of Jang et al. (2016) that the negative affectivity of workers such as tension, depression and fatigue was lower and the positive affectivity of workers was higher in the workplace where an indoor garden was created than the workplace where no indoor garden was created. The healing garden created with natural materials seemed to affect the positive affectivity of visitors. In addition, differences in the positive and negative affectivity of healing garden visitors between their age groups were analyzed (Table 7), and the positive affectivity of those in their 60s or older was higher than those in their 20s-30s, which was statistically significant. However, there was no statistically significant difference in the negative affectivity of visitors between their age groups. Differences in the positive and negative affectivity of healing garden visitors between their academic back-

ground, occupation and average monthly income were analyzed, but there was no statistically significant difference between the groups of healing garden groups (data not shown). Jang et al. (2019) analyzed changes in the emotional state of visitors who experienced agro-healing at the 2018 Changwon Agricultural Technology Exhibition and reported that those in their 20s-30s who experience difficulties such as job seeking and marriage showed a high level of negative affectivity such as tension, depression and fatigue, which is similar to the results of this study that the positive affectivity of those in their 20s-30s was lower than other age groups.

Ratio of healing garden visitors' loyalty and satisfaction

Healing garden visitors' satisfaction and loyalty were surveyed and the ratio of positive responses including 'agree' and 'strongly agree' both in satisfaction and loyalty was very high (76-85%; Tables 8 and 9). Combined with

Table 7. Differences in positive and negative affect schedule by age of healing garden visitors

V ^z	Under 20	20s	30s	40s	50s	60s or over	F	p
P	31.94±8.19ab	27.78±8.18a	28.40±8.51a	32.67±7.79ab	32.20±8.62ab	34.49±8.22b	4.466	.001***
N	12.69±4.00a	11.51±2.81a	12.54±5.37a	11.84±4.23a	11.84±3.38a	13.40±5.04a	1.527	.181 ^{NS}

Note. Values are mean ± standard deviation (N = 285). Mean separation within rows by Tukey's multiple range test, 5% level.

^zV= Variance; P= Positive affect; N= Negative affect.

^{NS}Non-significant, *** $p \leq .001$ by one way ANOVA.

Table 8. The visitors' satisfaction in the healing garden(N = 285)

Evaluation item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	n	%	n	%	n	%	n	%	n	%
Satisfaction 1 ^z	2	0.7	5	1.8	41	14.4	96	33.8	140	49.3
Satisfaction 2	2	0.7	6	2.1	43	15.1	88	31.0	145	51.1
Satisfaction 3	1	0.4	6	1.8	44	15.5	90	31.6	143	50.4

^zSatisfaction 1 = Visiting this place was better than I thought; 2 = Visiting this place was a wise choice; 3 = Overall, I am satisfied with the visit here.

Table 9. The visitors' revisit intention in the healing garden(N = 285)

Evaluation item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	n	%	n	%	n	%	n	%	n	%
Loyalty 1 ^z	2	0.7	6	2.1	56	19.7	116	40.9	104	36.6
Loyalty 2	3	1.1	10	3.5	53	18.7	114	40.1	104	36.6
Loyalty 3	1	0.4	12	4.2	56	19.7	104	36.6	111	39.1

^zLoyalty 1 = I can tell others the healing garden positively; Loyalty 2 = I intend to revisit the healing garden; Loyalty 3 = I want to strongly recommend my friends and others for visiting the healing garden.

visitors' satisfaction and intention to revisit the healing garden, these results indicate that promoting healing gardens at exhibitions that are annually held will be a good opportunity to publicize the usefulness of healing gardens. For this reason, healing garden visitors' satisfaction in an exhibition can affect their intention to revisit it (Park, 2014), and their intention to revisit can be not only an essential element to assess agricultural technology exhibitions or urban agriculture expos, but also an important variable in securing market demand (Kim, 2006). In addition, Ahn and Yoo (2016) reported that the satisfaction that those who visited an agriculture expo felt was high (82%) and most of them showed intention to revisit the expo, which supports the results of this study that healing garden visitors' satisfaction and intention to revisit the healing garden was very high.

Differences in visitors' loyalty depending on their demographic characteristics

To examine differences in healing garden visitors' loyalty depending on their gender and academic background, gender and academic background were set as an independent variable and loyalty was set as a dependent variable to conduct cross-tabulation analysis (Table 10). Loyalty 1 and Loyalty 3 did not show a statistically significant difference, while Loyalty 2 showed a statistically significant difference ($p < .05$). Therefore, it can be said that there was no difference depending on visitors' gender and academic background in Loyalty 1 ('I can tell others the healing garden positively') and Loyalty 3 ('I want to strongly recommend my friends and others for visiting the healing garden'), but that there was a difference in Loyalty 2 ('I intend to revisit the healing garden'). In addition, differences in loyalty between age groups were analyzed, and Loyalty 1 and Loyalty 3 showed $\chi^2 = 32.575$ and $\chi^2 = 33.521$ respectively, which was a statistically significant difference ($p < .05$). This indicates that there was a difference between age groups in the question of telling others the healing garden positively and the question of intending to strongly recommend friends or others for visiting the healing garden, but that there was no difference between age groups in the question of intending to revisit the healing garden. Compared to oth-

er age groups, however, the score of those in their 30s for all the three questions about loyalty was lowest.

Correlation between healing garden visitors' key variables and positive and negative affectivity

The correlation between the plant cultivation activity level of healing garden visitors and their score of the Korean-version Positive and Negative Affect Schedule (PANAS) was analyzed and a positive correlation between positive affectivity and plant cultivation experience or plant preference or plant-related events was observed, which was statistically significant (Table 11). A negative correlation between negative affectivity and plant cultivation experience or plant preference or plant-related events was observed, but not statistically significant. In addition, the correlation between the Perceived Restorativeness Scale (PRS) of healing garden visitors and the positive and negative affectivity was analyzed, and a positive correlation between positive affectivity and all the four elements of the PRS was observed. A negative correlation between negative affectivity and all the four elements was also observed, which was statistically significant except legibility. In particular, the positive correlation between repose or fascination and positive affectivity was high (higher than 0.7; Table 12). In addition, the correlation between healing garden visitors' loyalty and satisfaction and the PANAS was analyzed. While all the questions about loyalty and satisfaction equally showed a positive correlation with positive affectivity, they showed a negative correlation with negative affectivity, which was statistically significant (Tables 13 and 14).

These results can be interpreted that the higher the attention restoration of visitors due to their plant cultivation activity level and healing garden, the higher their positive affectivity and the lower their negative affectivity, and that the higher their positive affectivity and the lower their negative affectivity, the higher their satisfaction and royalty. In addition, the results of this study that there were a positive correlation between positive affectivity and plant cultivation activity level or attention restoration, and a negative correlation between negative affectivity and them were similar to the results of Lee (2016) and Jang et al. (2019). Lee (2016) reported that being away and fascination among

Table 10. Differences in loyalty depending on demographic variables of healing garden visitors

Loyalty item	Variable	Loyalty scale (%)					χ^2
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Gender							
Loyalty 1	Male	0.8	3.1	18.9	39.4	37.8	1.479
	Female	0.6	1.3	20.4	42.0	35.7	
Loyalty 2	Male	0.0	5.5	13.4	44.9	36.2	9.736*
	Female	1.9	1.9	22.9	36.4	36.9	
Loyalty 3	Male	0.0	5.5	18.9	35.4	40.2	1.943
	Female	0.6	3.2	20.4	37.6	38.2	
Education background							
Loyalty 1	Under high school	5.3	5.3	15.8	36.8	36.8	10.827
	High school	1.7	1.7	21.1	40.4	35.1	
	University	0.0	1.9	21.4	41.5	35.2	
	Graduate school	0.0	2.0	14.3	40.8	42.9	
Loyalty 2	Under high school	0.0	10.5	15.8	47.4	26.3	23.876*
	High school	5.2	0.0	21.1	33.3	40.4	
	University	0.0	3.1	21.4	40.9	34.6	
	Graduate school	0.0	6.1	8.1	42.9	42.9	
Loyalty 3	Under high school	0.0	10.6	26.3	26.3	36.8	10.545
	High school	1.8	3.5	19.3	38.6	36.8	
	University	0.0	4.4	21.4	37.1	37.1	
	Graduate school	0.0	2.0	12.3	36.7	49.0	
Age							
Loyalty 1	Under 20	6.3	0.0	12.5	43.8	37.5	32.575*
	20s	0.0	5.4	13.5	45.9	35.1	
	30s	2.9	2.9	31.4	51.4	11.4	
	40s	0.0	0.0	23.2	41.1	35.7	
	50s	0.0	0.0	20.3	35.1	44.6	
	60 or over	0.0	4.6	15.4	36.9	43.1	
Loyalty 2	Under 20	0.0	6.3	18.8	50.0	25.0	20.705
	20s	0.0	2.7	18.9	45.9	32.4	
	30s	2.9	2.9	31.4	48.6	14.3	
	40s	0.0	1.8	17.9	46.4	33.9	
	50s	1.4	4.1	18.9	29.7	45.9	
	60 or over	1.5	4.6	12.3	36.9	44.6	
Loyalty 3	Under 20	0.0	6.3	31.3	31.3	31.3	33.521*
	20s	0.0	8.1	10.8	45.9	35.1	
	30s	2.9	2.9	40.0	37.1	17.1	
	40s	0.0	1.8	17.9	41.1	39.3	
	50s	0.0	4.1	23.0	27.0	45.9	
	60 or over	0.0	4.6	9.2	38.5	47.7	

Note. Dependent variable: Loyalty. Loyalty was rated on a 5-point Likert scale.

Loyalty 1 = I can tell others the healing garden positively; Loyalty 2 = I intend to revisit the healing garden; Loyalty 3 = I want to strongly recommend my friends and others for visiting the healing garden.

* $p < .05$ by cross correlation analysis (N = 285).

Table 11. Correlation between level of plant cultivation activity and positive affect & negative affect of healing garden visitors

Variance	Plant cultivation experience	Plant preference	Plant-related events	Positive affect	Negative affect
Plant cultivation experience	1				
Plant preference	.760**	1			
Plant-related events	.683**	.778**	1		
Positive affect	.228**	.284**	.407**	1	
Negative affect	-.087	-.084	-.053	-.017	1

** $p < .01$ (N = 285).

Table 12. Correlation between perceived restorativeness elements and positive affect & negative affect of healing garden visitors

Variance	Repose	Fascination	Coherence	Legibility	Positive affect	Negative affect
Repose	1					
Fascination	.830**	1				
Coherence	.358**	.393**	1			
Legibility	.487**	.511**	.499**	1		
Positive affect	.699**	.730**	.341**	.539**	1	
Negative affect	-.142*	-.199**	-.208**	-.047	-.017	1

* $p < .05$, ** $p < .01$ (N = 285).

Table 13. Correlation between satisfaction and positive affect & negative affect of healing garden visitors

Variance	Satisfaction 1 ^z	Satisfaction 2	Satisfaction 3	Positive affect	Negative affect
Satisfaction 1 ^z	1				
Satisfaction 2	.833**	1			
Satisfaction 3	.813**	.865**	1		
Positive affect	.520**	.491**	.512**	1	
Negative affect	-.276**	-.231**	-.276**	-.017	1

^zSatisfaction 1 = Visiting this place was better than I thought; 2 = Visiting this place was a wise choice; 3 = Overall, I am satisfied with the visit here.

** $p < .01$ (N = 285).

Table 14. Correlation between level of loyalty and positive affect & negative affect of healing garden visitors

Variance	Loyalty 1 ^z	Loyalty 2	Loyalty 3	Positive affect	Negative affect
Loyalty 1 ^z	1				
Loyalty 2	.807**	1			
Loyalty 3	.811**	.861**	1		
Positive affect	.616**	.589**	.608**	1	
Negative affect	-.249**	-.207**	-.210**	-.017	1

^zLoyalty 1 = I can tell others the healing garden positively; Loyalty 2 = I intend to revisit the healing garden; Loyalty 3 = I want to strongly recommend my friends and others for visiting the healing garden.

** $p < .01$ (N = 285).

the four elements of the PRS in a flower expo showed a positive correlation with pleasure. Jang et al. (2019) reported a high positive correlation between positive affectivity and the plant cultivation activity level or attention restoration or vitality of those who visited the agro-healing exhibition at the Changwon Agricultural Technology Exhibition and a negative correlation with negative affectivity such as tension-anxiety, anger and confusion, and concluded that plant cultivation activity level can have a positive and useful impact on attention restoration and changes in emotions.

Effects of key variables and demographic variables on healing garden visitors' satisfaction and loyalty

The effects of the plant cultivation activity level, Perceived Restorativeness Scale (PRS) and Korean-version Positive and Negative Affect Schedule (PANAS) of healing garden visitors on their satisfaction and loyalty were analyzed us-

ing regression analysis that included dummy variables (Tables 15 and 16). To examine the effects of the plant cultivation activity level, PRS and Korean-version PANAS of visitors and their demographic variables used as a control variable on their satisfaction, regression analysis that included dummy variables was performed and fascination among the four elements of the PRS, positive affectivity and negative affectivity were found to affect healing garden visitors' satisfaction, which was statistically significant. Therefore, it seems that the higher the fascination level and positive affectivity of healing garden visitors and the lower their negative affectivity, the higher their satisfaction. Compared to this, healing garden visitors' control variables including age group, academic background, occupation and average monthly income were found not to affect visitors' satisfaction. Fascination explained 28% of satisfaction, a dependent variable; fascination and positive affectivity explained 32%; fascination and positive and negative affectivity explained 35%. In addition, the results of analysis

Table 15. The effect of level of plant gardening activity, perceived restorativeness scale, positive affect and negative affect schedule, and demographic variables on satisfaction

Independent variable	B	β	<i>t</i>	R^2	Change in R^2	<i>F</i>
(Constant)	2.88					
Fascination	0.25	.27	3.39***	.35	.28	40.02
Positive affect	0.03	.33	4.24***		.04	
Negative affect	-0.03	-.18	-3.17**		.03	

Note. Dependent variable: Satisfaction. Satisfaction was rated on a 5-point Likert scale.

Satisfaction item 1=Visiting this place was better than I thought; 2=Visiting this place was a wise choice; 3=Overall, I am satisfied with the visit here.

** $p < .01$, *** $p < .001$ (N = 285).

Table 16. The effect of level of plant gardening activity, perceived restorativeness scale, positive and negative affect schedule, and demographic variables on loyalty

Independent variable	B	β	<i>t</i>	R^2	Change in R^2	<i>F</i>
(Constant)	2.27					
Positive affect	0.04	.44	6.35***	.47	.39	48.81
Fascination	0.29	.27	3.31***		.05	
Negative affect	-0.03	-.15	-2.96**		.02	
Age dummy variable-2(20s)	-0.29	-.12	-2.38*		.01	

Note. Dependent variable: Loyalty. Loyalty was rated on a 5-point Likert scale.

Loyalty item 1=I am able to talk positively to other people to healing garden. Loyalty 2=After visit this place, I am willing to try the healing garden again. Loyalty 3=I am strongly recommend to healing garden to relatives or friends.

* $p < .05$, ** $p < .01$, *** $p < .001$ (N = 285).

of variance conducted to assess the goodness of fit of the regression model showed that the F value was 40.021, indicating that it was significant at $p < .001$. Therefore, the regression model below can be assessed to be fit. That is, in terms of the relative explanatory power of independent variables that affect healing garden visitors' satisfaction, fascination was found to have the highest impact, followed by positive affectivity and negative affectivity, and among the four elements of the PRS, fascination was found to be the most influential variable.

In addition, to examine the effects of the plant cultivation activity level, PRS and Korean-version PANAS of visitors and their demographic variables used as a control variable on their loyalty, regression analysis that included dummy variables was performed, and fascination among the four elements of the PRS, positive affectivity, negative affectivity and age group (20s) among control variables were found to affect healing garden visitors' loyalty. That is, the higher the fascination level and positive affectivity of healing garden visitors and the lower their negative affectivity, the higher their loyalty. Among these variables, positive affectivity, fascination, negative affectivity and age group (20s) explained 47% of loyalty, and among them, the explanatory power of positive affectivity was highest (39%). In addition, the F value was 48.814, which indicated that it was significant at $p < .001$, and thus that the regression model below is fit. Therefore, in terms of the relative explanatory power of independent variables that affect healing garden visitors' loyalty, positive affectivity was found to have the highest impact, followed by fascination, negative affectivity and age group, and among them positive affectivity was found to be the most influential variable. In addition, the results of the analysis of the correlation of satisfaction or loyalty with positive and negative affectivity showed a positive correlation with positive affectivity and a negative correlation with negative affectivity, which indicates that useful effects can be expected from healing gardens. The natural environment was found to have many characteristics that can restore directed attention (Hartig et al., 1991), and when a certain environment has many fascinating elements, people's attention is naturally drawn to them without paying a special attention (Kaplan, 1993), which supports the results of this study that the analysis

results of the plant cultivation activity level, PRS and Korean-version PANAS of healing garden visitors have a positive impact on their satisfaction and loyalty.

Conclusion

This study aimed to examine the effects of healing garden visitors' positive emotions depending on their perceived restorative environment on their satisfaction and intention to revisit the healing garden. Their psychological indicators about the images of the healing garden created within the urban agriculture future exhibition were analyzed based on the three elements of plant cultivation activity level using the demographic characteristics of visitors as variables, and there were statistically significant differences between age groups and occupation groups. The Perceived Restorativeness Scale (PRS) of visitors showed statistically significant differences in three elements including repose, fascination and legibility between age groups between age groups, and the PANAS of visitors showed statistically significant differences in positive affectivity between age groups. In addition, the correlation of the PANAS with the three elements of plant cultivation activity level, the four elements of the PRS, satisfaction and loyalty was analyzed, and it showed a positive correlation with all the three elements of plant cultivation activity level, the four elements of the PRS, satisfaction and loyalty, and a negative correlation with negative affectivity, which was statistically significant. To examine the effects of plant cultivation activity level, attention restoration and the PANAS on healing garden visitors' satisfaction and loyalty, multiple regression analysis that included dummy variables was performed, and among the four elements of the PRS, fascination and positive affectivity were found to be variables that affect healing garden visitors' satisfaction and loyalty.

The results of this study indicated that the higher the attention restoration of visitors due to the fascination of the healing garden and the higher their positive affectivity and the more they have plant-related memories, the higher their impact on healing garden visitors' satisfaction and loyalty. In the process of interactions with the surrounding environment, fascination efficiently restores consumed di-

rected attention (Kaplan, 1993), and in particular the more leaves of plants, a fascinating element that can be obtained from healing gardens, people can see, the more their directed attention is restored and thus the more positive impact on emotions can be obtained (Lee, 2007), which supports the results of this study. Even those who may not frequently experience the natural environment or are in an environment with little natural elements can reduce their stress simply by contacting a small amount of restorative elements (Kaplan and Kaplan, 1989; Lee and Hyun, 2003b)

Therefore, fascinating natural environments or greenery landscapes like healing gardens where people can contact plants were reported to reduce negative emotions such as anger and sadness but to increase positive emotions such as pleasure, joy and satisfaction (Hartig et al., 1991; Ulrich et al., 1991), and similar to the results of earlier studies, it is expected to obtain positive effects from such environments. As a result, creating healing gardens within exhibitions is expected to affect visitors' repose, fascination and positive emotions and thus to be utilized in improving their satisfaction and intention to revisit them.

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