Impact of airport green atmospherics on mental health value, image, and loyalty among visitors and workers

Abstract

Nature-based solutions (NBS) are becoming increasingly crucial as NBS brings diverse health-related benefits to travelers and workers in the tourism business sector. This research explored the influence of green atmospherics as NBS on airport occupants' mental health value, image, and loyalty generation processes. A quantitative approach with a field survey method was employed. A structural equation modeling and metric invariance test were used as data analysis technique. Our empirical result revealed that green atmospherics as NBS significantly improve the occupants' mental health value and image of the airport, and these variables contribute to their loyalty enhancement for the airport. The effect of green spaces and natural surroundings on loyalty was maximized through mental health value and image. In addition, the linkages from natural surroundings to mental health value and image were stronger in the visitor group whereas the mental health value – loyalty relation was stronger in the worker group.

Keywords: Airport visitors, airport workers, green atmospherics, nature-based solutions, mental health value, image

1. INTRODUCTION

Local governments and diverse tourism/hospitality business operations in destinations are eager to use nature as solution for lessening the societal/environmental challenges caused by the excessive development of the tourism industry (Fossgard & Fredman, 2019; Han & Hyun, 2019; McCreary et al., 2019). This phenomenon is on the basis of the belief that nature basically plays an essential role in recovering the polluted environment as well as improving human mental and

physical health (Lafortezza et al., 2018). Accordingly, the benefits of using an ecosystem based on environmental infrastructures and designs often receive increasing attention in diverse tourism business sectors comprising an airport/airline sector (Fossgard & Fredman, 2019; Hinnen, Hille, & Wittmer, 2017; McCreary et al., 2019). Nature-based solutions (NBS) are the fundamental aspect of such an ecosystem-related approach. NBS indicates human activities to preserve, manage, and recover ecosystems and the greater natural environment for efficiently alleviating societal challenges (Han & Hyun, 2019). NBS is especially of importance as it offers long-lasting sustainable solutions delivering considerable health-related benefits (e.g., well-being, physical/mental health) to occupants in a building/place (Gascon et al., 2017; Lafortezza et al., 2018).

In an airport, greening the physical environment can be a crucial facet of NBS efforts. All occupants of the airport (visitors and workers) are irrefutably under the influence of such environment (Moon et al., 2016). Indeed, scholars in business and tourism indicated that physical surroundings affect both patrons' and workers' responses and behaviors (approach or avoidance) (Bitner, 1992; Han, Yu, & Hyun, 2019; Han & Hyun, 2019; Hwang & Choi, 2018). Green physical surroundings of a place/building as NBS are also believed to be advantageous for proprietors in an environmental, social, and economical way as compared to traditional ones (Lafortezza et al., 2018). The effective use of green atmospherics as NBS in business generate effective solutions for improving the individuals' mental health/emotional well-being, increasing the image/reputation of the place, and eliciting positive behaviors for a place/firm (Hwang & Choi, 2018; Hwang & Lyu, 2018; Nikolaidis et al., 2017; Liang et al., 2014; Muposhi & Dhurup, 2016). Likewise, the adequate implementation of NBS in operating an airport can be critical as it affects both airport visitors' and workers' health and behaviors.

Despite the importance of green atmospherics as NBS and its crucial impact, existing research has hardly employed the concept of NBS for the explication of airport occupants' responses and behaviors. In addition, little research has considered the possible influence of both man-made specially-designed green spaces and natural green environment together on the occupants' decision formation. Moreover, although the importance of increasing individuals' mental health value and place image has been indicated in existing environmental/consumer behavior studies (Muposhi & Dhurup, 2016; Su & Swanson, 2019), little is known about how these variables are related to green atmospherics as NBS in generating the occupants' loyalty for the airport. Furthermore, an occupant's decision formation is generally considered to be different by its type (Han & Hyun, 2019; Wheeler et al., 2007), and the theoretical deepening delineating the dissimilarity regarding the impact of NBS on airport visitors' and workers' loyalty generation process has hardly been made.

Given this, the present study was designed to explicate individuals' loyalty formation for an airport by taking the effect of green atmospherics as NBS, mental health value, image, and occupant type into account. Specifically, we attempted (1) to develop a robust conceptual framework of loyalty among airport visitors and among airport workers, respectively, (2) to unearth the clear role of green atmospherics as NBS ([a] specially-designed green spaces and [b] natural surroundings) in enhancing occupants' mental health value and image of the airport, (3) to uncover the mediating effect of mental health value and image, (4) to identify the salient factor in boosting loyalty, and (5) to uncover the moderating influence of occupant type (visitors and workers) on the associations among research constructs in the airport business context.

2. REVIEW OF THE LITERATURE

2.1. Airport and green atmospherics as NBS

Green airport designs are becoming increasingly important in lowering carbon emissions (Jkassim & Hussien, 2014) as well as improving ~~improves~~ the occupants' pleasurable experiences (Hwang & Choi, 2018; Moon et al., 2016). That is, it is not only contributive to the environmental protection but also contributive to the occupants' positive responses. The airport occupants mainly comprise visitors (e.g., airline passengers, transient visitors) and workers (e.g., staff of airlines, staff of retail stores, staff of airport). It is broadly understood that advancing the green technology of an airport brings water saving, energy saving, and waste reduction, which eventually results in its return on investment (Jkassim & Hussien, 2014). Yet, the emerging sustainable issue at an airport in recent years involves providing green atmospherics for the occupants. While its possible effect on the occupants has not been empirically estimated, the green atmospherics of an airport is receiving a growing attention from researchers and practitioners.

Green physical surroundings of a building/place are irrefutably a core aspect of NBS (Gascon et al., 2017; Han et al., 2019; Lafortezza et al., 2018; Liang et al., 2014). An airport's green atmospherics that visitors and workers are likely to perceive/feel can be green spaces/areas for resting/waiting for flights, various living plants (e.g., flowers, trees, potted plants) in cafés/restaurants/shopping places, green interior décor, surrounding natural environment (e.g., ocean, river, lake, natural park, forest), fresh air (e.g., dust free, natural scent), and comfortable weather (e.g., temperature, humidity) (Han, 2013; Hwang & Choi, 2018; Moon et al., 2016, 2017; Pietilä et al., 2015). Muposhi and Dhurup (2016) and Han and Hyun (2019) asserted that green physical environment as NBS is of essence in reliving individuals' mental anxiety/stress and increasing place image. Likewise, green atmospherics as NBS and its constituents at an

airport can play a crucial role in improving the occupants' mental health value soothing their stress and turning their anxiety into confidence as well as boosting a favorable image of the airport.

2.2. Mental health value

Mental health value has often been examined in the recent tourism/business literature due to its criticality in influencing customer/employee behaviors (e.g., Ariza-Montes et al., 2018; Cleary et al., 2018; Gascon et al., 2017; Hwang & Lee, 2019; Liang et al., 2014; Lin & Niu, 2018; Su & Swanson, 2019). Evidence in these studies revealed that patrons/workers often perceive mental health value when they are exposed to natural environment and green spaces, and that such mental health value elicits their positive decision/behavior for the place/company. Mental health refers to individuals' cognitive self-evaluation regarding the conditions of their present mental health (Gascon et al., 2017; Vujcic et al., 2017). Likewise, mental health value indicates individuals' cognitive assessment if such current mental health conditions improve when engaging a certain behavior (e.g., consumption, working). Relieving mental anxiety/stress/worry, boosting self-confidence, and improving well-being perception are all indicators of mental health value enhancement (Cleary et al., 2018; Lundberg & Manderbacka, 1996; Vujcic et al., 2017).

2.3. Airport image ~~and its influence~~

The image of a company/brand/place perceived by individuals is of utmost importance in consumer/employee behavior literature (Dichter, 1985; Hwang & Kim, 2019; Song et al., 2019; Xie, Zhu, & Wang, 2019; Yurchisin et al.., 2010; Zhang et al., 2014). According to Dichter (1985), image indicates an individual's full set of impressions of a company/brand formed

through direct/indirect interactions (e.g., observation, consumption, working) between him/her and the company/brand. In a broad manner, this image embraces such concepts as beliefs and perceptions (Lee et al., 2010; Song et al., 2019). It is irrefutable that the prediction capacity of individuals' loyalty for a company/place is likely to be enhanced by the image that they hold (Baloglu & McCleary, 1999; Oliver, 2010; Yurchisin et al.., 2010). Individuals who have a positive image about a company/brand often remain with it and recommend it to other people, whereas those holding a negative image of the company/brand frequently leave the relationship by switching to a rival company/brand and engage in negative word-of-mouth behaviors (Dichter, 1985; Oliver, 2010; Xie, Zhu, & Wang, 2019; Zhang et al., 2014).

2.4. Influence of green atmospherics

Many existing studies in a variety of contexts have made an empirical examination regarding the role of NBS (Ling, 2013; Moon et al., 2017; Muposhi & Dhurup, 2016). These studies found significant linkage between green atmospherics as NBS and individuals' mental health/well-being and place/product image. In particular, Ling (2013) found that green atmospherics significantly increase a company's image and loyalty for it. He also indicated that green atmospherics eventually induces patrons' environmentally responsible purchase intention. Similarly, Muposhi and Dhurup (2016) investigated the association between green atmospherics and store image. Their research findings showed that green atmospherics encompassing green ambience, green design, and green social service significantly trigger green store image, and that this relationship contributes to increasing store loyalty and eliciting green purchase behavior. More recently, Han and Hyun (2019) explored the effect of green indoor and outdoor environment as NBS. Their empirical findings showed that hotel customers' mental health and

well-being are under the significant influence of green physical surroundings. In addition, their result showed that this green atmospherics as NBS also significantly affect hotel employees mental health and well-being. Their finding was in line with Bitner's (1992) earlier indication that physical surroundings are of importance in inducing both patrons' and workers' positive/negative responses/behaviors for a firm. Based on the preceding evidence, the following hypotheses were developed:

Hypothesis 1a: A positive association exists between specially-designed green spaces and mental health value among visitors.

Hypothesis 1b: A positive association exists between specially-designed green spaces and mental health value among workers.

Hypothesis 2a: A positive association exists between natural surroundings and mental health value among visitors.

Hypothesis 2b: A positive association exists between natural surroundings and mental health value among workers.

Hypothesis 3a: A positive association exists between specially-designed green spaces and airport image among visitors.

Hypothesis 3b: A positive association exists between specially-designed green spaces and airport image among workers.

Hypothesis 4a: A positive association exists between natural surroundings and airport image among visitors.

Hypothesis 4b: A positive association exists between natural surroundings and the airport image among workers.

2.5. Influence of mental health value

Researchers generally agree that individuals' mental health value plays a critical role in generating positive behaviors for a company/place/product (Ariza-Montes et al., 2018; Cleary et al., 2018; Hwang & Lee, 2019; Hwang & Lyu, 2018; Lin & Niu, 2018; Su & Swanson, 2019). For instance, in the tourism business context, Hwang and Lee (2019) investigated senior travelers' behaviors. Their empirical result revealed that senior travelers' mental health value along with product attachment and attitude are crucial drivers of their loyalty for the company. In the hotel sector, Su and Swanson (2019) examined the role of corporate social responsibility in explicating hotel employee-company relationships. Their empirical finding showed that employee mental health/well-being is a significant proximal determinant of employees' green loyalty behaviors. Their finding was in line with Ariza-Montes et al.'s (2018) research finding that hospitality workers' mental health is a vital factor in inducing their job satisfaction and loyalty. These studies all supported the significance of mental health value in customers and workers' loyalty generation process. Accordingly, we proposed the following hypotheses:

> Hypothesis 5a: A positive association exists between mental health value and loyalty for the airport among visitors.
>
> Hypothesis 5b: A positive association exits between mental health value and loyalty for the airport among workers.

2.6. Influence of airport image

It has been acknowledged that the image of a company/place plays an essential role in

individuals' evaluation process, decision formation, and choice behaviors (Dichter, 1985; Baloglu & McCleary, 1999; Hwang et al., 2015; Hwang & Kim, 2019; Lee et al., 2010; Yurchisin et al.., 2010). For instance, Song et al. (2019) empirically assessed the effect of image in the hospitality sector. Their finding revealed that image is a significant contributor to enhancing patrons' loyalty for a particular brand. In their meta-analysis, Zhang et al. (2014) uncovered that travelers' overall image of a place included the greater influence on their loyalty as compared to cognitive and affective factors. Likewise, in their empirical research of employees' decision-making process, Yurchisin et al. (2010) found that employees' image of the store along with image congruence is the crucial determinant of employee commitment and intention to remain, which are significant constituents of loyalty. Undoubtedly, if the image of a company is favorable, employees are likely to think that the store is an attractive place to work (Hwang et al., 2015). Based on the evidence discussed above, we developed the following research hypotheses:

> Hypothesis 6a: A positive association exits between image of the airport and loyalty for the airport among visitors.
> Hypothesis 6b: A positive association exists between image of the airport and loyalty for the airport among workers.

2.7. Occupant type and its influence

It is broadly acknowledged that physical environment affects occupants' cognitive, affective, and conative reactions and behaviors within a building/place (Bitner, 1992; Han et al., 2018; Moon et al., 2016; Wheeler et al., 2007). The same is true for green physical surroundings of a

building/place. Indeed, the effect of green physical surroundings on occupants' behaviors was previously uncovered in the tourism business sector (Trang et al., 2018). Yet, interestingly, the magnitude of the impact of physical (or green physical) surroundings is dissimilar across occupant type. For example, researchers in existing studies asserted that occupant type is an essential construct as decision formation and behaviors often differ based on the type of the occupants within a building/place (Han et al., 2018; Han & Hyun, 2019; Wheeler et al., 2007). In particular, Wheeler et al. (2007) indicated that a clean air policy includes a dissimilar level of influence on patrons' response and workers' response. In the shopping sector, Han et al. (2018) found that duty-free shop occupants' cognitive perception and intention formation are under the significant influence of physical environment performance.

More recently, in the hotel context, Han and Hyun (2019) explored the effect of the type of hotel occupants (customers and employees). Their empirical result showed that customers' and employees' decision-making processes were significantly different, thus providing the evidence of the moderating impact of occupant type. The results of these studies are in line with Bitner's (1992) earlier indication that consumers and workers in any consumption/work situation are under the influence of the surrounding physical environment of a building/place where the consumption/work takes place and that the approach and avoidance responses of such consumers and workers can differ. Given this, a critical role of occupant type is evident. Within an airport, the occupants can be mostly visitors (e.g., airline customers and transient visitors) and workers (e.g., staff of airlines/retail stores/airport) (Moon et al., 2017). Thus, in the airport business context of the present research, the following hypotheses were developed:

Hypothesis 7a: The association between specially-designed green spaces and mental

health value differs across visitors and workers.

Hypothesis 7b: The association between natural surroundings and mental health value differs across visitors and workers.

Hypothesis 7c: The association between specially-designed green spaces and image of the airport differs across visitors and workers.

Hypothesis 7d: The association between natural surroundings and image of the airport differs across visitors and workers.

Hypothesis 7e: The association between mental health value and loyalty for the airport differs across visitors and workers.

Hypothesis 7f: The association between image of the airport and loyalty for the airport differs across visitors and workers.

2.8. Proposed conceptual framework

The proposed theoretical framework comprises a total of five research constructs (i.e., specially-designed green spaces, natural surroundings, mental health value, image of the airport, loyalty for the airport). In addition, it includes occupant type as a moderator. A total of seven research hypotheses are contained in the proposed conceptual framework.

3. METHODOLOGY

3.1. Measures and survey questionnaire

The survey questionnaire included the description of the study, the questions for research variables, and the questions regarding personal characteristics. To evaluate research variables, the measures were employed from the exiting studies (Gascon et al., 2017; Han & Hyun, 2019;

Henning-Thurau, 2004; Lee et al., 2010; Moon et al., 2016; Oliver, 2010; Pietilä et al., 2015; Vujcic et al., 2017; Xu et al., 2018). Multiple items and 7-point Likert scales were used. In particular, four items were utilized for the evaluation of specially-designed green spaces (e.g., "Specially-designed green spaces/areas for resting and waiting for flight are readily available within and outside this airport"). We also used four items to measure natural surroundings (e.g., "This airport is located close to natural environments [e.g., ocean/river, forests, lakes, natural parks]"). In addition, to assess mental health value, we utilized four items (e.g., "Staying [Working] at this airport helps me turn any worry/anxiety into confidence"). For the evaluation of image of the airport, three items were used (e.g., "Compared to other airports, this airport has a good image"). Lastly, we utilized four items to evaluate loyalty for the airport (e.g., "I am very attached to this airport"). The initial version of the questionnaire containing these measures was pre-tested with tourism academics and airport practitioners. Based on their comments, a few corrections and changes were made. Two tourism experts then reviewed and finalized the questionnaire.

3.2. Data collection process for visitors

To collect the data from airport users, a field survey was conducted at international airports located in metropolitan cities of South Korea. The airports are generally regarded to be operated and managed in an eco-friendly way and are considered to have acceptable green atmospherics. Well-trained graduate students who work at the airports act as surveyors. They approached those visitors in the rest areas, lounges, seating/waiting areas near the departure lounge, and cafés/restaurants. Then, the surveyors requested visitors to participate in the survey with the brief explanation of the survey purposes. The survey participation was voluntarily. Upon agreement of

the visitors' survey participation, a detailed explanation of the study was given to them. The completed questionnaire was returned onsite. After checking the completeness, a little gift was given to the respondents who completed the survey. Through this procedure, a total of 305 completed questionnaires were gathered. After excluding unusable cases, a total of 280 responses were used for the analysis of the data.

3.3. Demographic profile of visitors

Among 280 airport visitors, 59.6% were male, and 40.4% were female. The respondents' age ranged from 22 years old to 67 years old. Their mean age was 42.1 years old. When their education level was asked, about 77.1% indicated that they are either 4-year/2-year college graduates. In addition, about 16.4% reported that they have a graduate degree, and about 6.4% indicated that they have a high-school diploma or less. The survey participants' annual income level was asked. About 45.7% of the respondents reported their income between $40,001 – $70,000, followed by $40,000 or less (25.7%), between $70,001 – $100,000 (18.2%), and $100,001 or more (10.4%). Regarding the frequency of the airport visit within the last six months, about 47.1% reported 2 – 3 times, followed by one time (34.3%), 3 – 4 times (12.1%), and 6 times or more (6.4%). A majority of the participants' travel purpose was for pleasure (66.4%), followed by for business (23.6%) and other (10.0%).

3.4. Data collection process for workers

A field survey was conducted to collect the data from airport workers. The survey was at international airports in South Korea where the data collection from visitors was conducted. The surveyors were well-trained graduate students who work at the airports. Each surveyor

individually approached airport workers in diverse departments, and requested them to participate in the survey. The workers are mostly indoor workers who often encounter/see/observe airport visitors. Upon the agreement of their survey participation, the surveyors provided a detailed explication of the research to them. Afterwards, the participants were asked to thoroughly read and answer the questions in the survey questionnaire. The filled questionnaire was returned onsite. After the completeness check, a little gift was provided to the respondents. Through this process, we obtained a total of 265 complete responses. After removing the unusable responses, a total of 250 cases were utilized for data analysis.

3.5. Demographic profile of workers

Of 250 airport workers, 44.4% were male, and 55.6% were female. The participants' mean age was 34.4%, ranging from 20 years old to 59 years old. Regarding the participants' education level, approximately 75.6% reported that they had either 4-year/2-year college degree. In addition, approximately 23.2% indicated that they hold a graduate degree, and about 1.2% reported that they are high-school graduates or less. When their annual income level was asked, about 45.6% of the participants indicated their income between $40,001 – $70,000, followed by $40,000 or less (39.2%), between $70,001 – $100,000 (22.4%), and $100,001 or more (8.0%). Among the participants, about 76.0% were full-time workers whereas 24.0% were part-time workers. Lastly, about 26.0% indicated that they had worked at the airport 1 – 3 years, followed by 4 – 6 years (23.6%), 7 – 9 years (19.6%), and 10 years or more (32.8%).

4. DATA ANALYSIS AND RESULTS

4.1. Reliability and validity assessment for the visitor group

Using Amos 20 and SPSS 20, a confirmatory factor analysis was conducted for the generation of the measurement model. The confirmatory factor analysis is an effective way for the data quality testing encompassing composite reliability and construct-validity assessments (Hair et al., 2010). Results showed that the mode had an acceptable fit to the data (χ^2 = 348.002, df = 139, p < .001, χ^2/df = 2.504, RMSEA = .073, CFI = .958, IFI = .959, TLI = .949). All loading values (standardized) between observed variables and latent variables were significant at p < .01. An internal consistency check was conducted. As reported in Table 1-1, our result showed that all variables had the composite reliability values greater than the minimum threshold of .700 (Hair et al., 2010). The values ranged from .839 to .948, demonstrating the internal consistency among within-construct items for every research variable (specially-designed green spaces = .948, natural surroundings = .839, mental health value = .939, image of the airport = .938, loyalty for the airport = .885). For the assessment of construct validity, average variance extracted values were calculated. The values fell between .568 and .835 (specially-designed green spaces = .819, natural surroundings = .568, mental health value = .793, image of the airport = .835, loyalty for the airport = .657), exceeding the minimum threshold of .500 (Hair et al., 2010). In addition, as shown in Table 1-1, the values were greater than the between-construct correlations (squared). This provided evidence of convergent and discriminant validity for the visitor group.

(Insert Table 1-1)

4.2. Structural model assessment for the visitor group

A structural model was generated for the visitor group. The generated model included a satisfactory fit to the data (χ^2 = 367.227, df = 142, p < .001, χ^2/df = 2.586, RMSEA = .075, CFI

= .955, IFI = .956, TLI = .946). The model in general contained a sufficient level of the prediction power for visitor loyalty for the airport (R^2 = .845), metal health value (R^2 = .422), and image of the airport (R^2 = .325). Table 2-1 and Figure 1 encompassed the detailed results. The proposed associations among research constructs were tested. As anticipated, specially-designed green spaces (β = .275, p < .01) and natural surroundings (β = .423, p < .01) had a significant and positive effect on visitors' mental health value. Therefore, Hypotheses 1a and 2a were supported. In addition, the influence of specially-designed green spaces (β = .244, p < .01) and natural surroundings (β = .368, p < .01) on image of the airport was significant. Thus, Hypotheses 3a and 4a were supported. Moreover, the linkages from mental health value (β = .440, p < .01) and image of the airport (β = .660, p < .01) to visitor loyalty for the airport was significant. These results supported Hypotheses 5a and 6a.

(Insert Table 2-1)

(Insert Figure 1)

The indirect influence of study constructs was investigated. As exhibited in Table 2-1, specially-designed green spaces (β = .282, p < .01) and natural surroundings (β = .429, p < .01) contained a significant impact on loyalty indirectly through mental health value and image of the airport. This result implies that both mental health value and image acted as mediators in the proposed theoretical framework. Next, the total effect of study variables was assessed. Our result showed that image had the greatest influence on visitor loyalty for the airport (β = .660, p < .01), followed by mental health value (β = .440, p < .01), natural surroundings (β = .429, p < .01) and specially-designed green spaces (β = .282, p < .01).

4.3. Reliability and validity assessment for the worker group

To generate the measurement model for the worker group, a confirmatory factor analysis was conducted. Results revealed that the mode contained an adequate fit to the data (χ^2 = 424.378, *df* = 139, p < .001, χ^2/df = 3.053, RMSEA = .078, CFI = .929, IFI = .929, TLI = .912). All standardized loadings were significant at p < .01. Composite reliability was calculated. As shown in Table 1-2, our result indicated that all constructs contained the reliability values exceeding the cutoff of .700 suggested by Hair et al. (2010). The values fell between .841 and .955 (specially-designed green spaces = .913, natural surroundings = .841, mental health value = .930, image of the airport = .871, loyalty for the airport = .955). Thus, the internal consistency among multi-items for every construct was supported. To evaluate construct validity, average variance extracted values were formulated. The values ranged from .576 and .840 (specially-designed green spaces = .727, natural surroundings = .576, mental health value = .769, image of the airport = .693, loyalty for the airport = .840). The values were all greater than the cutoff .500 suggested by Hair et al. (2010). Moreover, as exhibited in Table 1-2, the values exceeded the correlations (squared) between variables. Accordingly, convergent and discriminant validity for the worker group was evident.

(Insert Table 1-2)

4.4. Structural model assessment for the worker group

A structural model was generated for the worker group. The model encompassed a satisfactory fit to the data (χ^2 = 436.283, *df* = 125, p < .001, χ^2/df = 3.072, RMSEA = .080, CFI = .926, IFI

= .927, TLI = .911). The model had a sufficient level of the predictive ability for worker loyalty for the airport (R^2 = .476), metal health value (R^2 = .212), and image of the airport (R^2 = .253). Table 2-2 and Figure 1 included the results in details. The hypothesized associations among the study variables were tested. As predicted, specially-designed green spaces (β = .354, p < .01) and natural surroundings (β = .178, p < .05) included a significant impact on workers' mental health value. Accordingly, Hypotheses 1b and 2b were supported. The effect of specially-designed green spaces (β = .447, p < .01) on image of the airport was also significant. Thus, Hypothesis 3b was supported. Yet, natural surroundings was not significantly related to image (β = .107, p > .05). Thus, Hypothesis 4b was not supported. In addition, our result showed that the paths from mental health value (β = .570, p < .01) and image of the airport (β = .279, p < .01) to worker loyalty for the airport was significant. These results supported Hypotheses 5b and 6b.

(Insert Table 2-2)

The indirect effect of research constructs was investigated. As reported in Table 2-2, specially-designed green spaces (β = .327, p < .01) and natural surroundings (β = .131, p < .01) exerted a significant influence on loyalty indirectly through mental health value and image of the airport. This result indicated that both mental health value and image played an important mediating role in the proposed model. Subsequently, the total influence of study constructs was assessed. Our result revealed that mental health value included the greatest total effect on worker loyalty for the airport (β = .570, p < .01), followed by specially-designed green spaces (β = .327, p < .01), image (β = .279, p < .01) and natural surroundings (β = .131, p < .05).

4.5. Invariance test between visitors and workers

An invariance test was conducted for the assessment of the hypothesized moderating effect of occupant types (visitors versus workers) at airports. A baseline model was generated. The visitor group included 280 respondents, and the worker group included 250 respondents. Results of the assessment of the baseline model in which all loadings across two groups were constrained to be equivalent revealed that the model contained a satisfactory fit to the data (χ^2 = 827.284, *df* = 298, p < .001, χ^2/*df* = 2.776, RMSEA = .058, CFI = .941, IFI = .942, TLI = .933). The baseline model was afterward compared to six nested models in which a particular linkage of interest was equally constrained in sequence. We used a chi-square test for this comparison process. The details regarding the results of the baseline model assessment and chi-square test are exhibited in Table 3 and Figure 2.

(Insert Table 3)

(Insert Figure 2)

Our result revealed that the linkages from specially-designed green spaces to mental health value ($\Delta\chi^2$ [1] = .454, p > .05) and to image of the airport ($\Delta\chi^2$ [1] = .671, p > .05) were not significantly different across visitor and worker groups. Thus, Hypotheses 7a and 7c were not supported. Yet, the links from natural surroundings to mental health value ($\Delta\chi^2$ [1] = 6.201, p < .05) and to image of the airport ($\Delta\chi^2$ [1] = 9.353, p < .01) differed significantly between visitor and worker groups. Hence, Hypotheses 7b and 7d were supported. Our evaluation result further showed that the paths from mental health value to loyalty for the airport was significantly different across visitor and worker groups ($\Delta\chi^2$ [1] = 12.778, p < .01). However, the relationship

between image of the airport and loyalty for it did not differ significantly between the two groups ($\Delta\chi^2$ [1] = 1.848, p > .05). Accordingly, Hypothesis 7f was not supported whereas Hypothesis 7e was supported.

5. DISCUSSION AND IMPLICATIONS

5.1. Overall research value and originality

In this research, the conceptual frameworks explicating occupant loyalty for the airport was successfully developed. Our simultaneous assessment of the theoretical framework containing our research constructs revealed a satisfactory level of prediction ability for both visitor and worker loyalty for the airport. Our research goes beyond empirical studies in the extant airport and tourism literature by demonstrating the critical role of occupant type. The present study contributes to enriching the literature of airport business and helping practitioners make efficient strategies for eliciting visitors' and workers' mental health and for enhancing airport image, which ultimately lead to loyalty increase. Overall, green atmospherics as NBS and its outcomes (mental health value, image, and loyalty) for visitors and workers are important but not well-known topics in the airport business and tourism literature. This study and its results, which successfully verified the effectiveness of NBS efforts in boosting both visitors' and workers' positive responses for the airport, therefore offer valuable insights into these critical topics.

5.2. Green atmospherics and its importance

The main feature of the proposed conceptual framework was the utilization of green atmospherics as airport NBS efforts. Results of the present research revealed that green atmospherics (green spaces and natural surroundings) were essential determinants of occupants'

mental health value and image of the airport. This finding implies that specially-designed green places of an airport and its surrounding natural environment are significant NBS factors influencing airport positive visitor and worker responses. This finding enriched the body of the airport business literature in that, to the best of our knowledge, this study was the first NBS research stressing the criticality of green atmospherics as its constituents and demonstrating its possible relationships with mental health value and image. Our research is thus theoretically of importance. Our result is also meaningful in practical terms. Specifically, our finding provided airport practitioners a vital information that crucial ways for the elicitation of occupants' favorable responses/behaviors for the airport comprise such examples/practices as (a) increasing the availability and readiness of green places/areas for resting/waiting for a flight, (b) placing a variety of living flowers, trees, and plants in diverse areas, (c) increasing green interior decorations, (d) improving air quality (fresh air, comfortable temperature, natural scent, dust-free), and (e) increasing glass walls/windows for natural light and the visibility of natural environment.

5.3. Criticality of airport image

Our examination of the comparative criticality among research constructs based on the results of the structural analysis revealed that the image of an airport (β = .660, p < .01) played a salient role in building visitor loyalty. Fisher's Z test as an accurate technique of comparing the magnitude of relationship strengths also supported that the effect of image is significantly greater than other variables (p < .01). From the managerial aspect, reflecting this finding regarding the importance of image, airport operators need to make every endeavor to improve the image of the airport. This effort could ultimately result in the increased visitor loyalty. From the theoretical

aspect, researchers should utilize image as a key concept when explicating airport visitors' loyalty generation process and post-purchase behavior.

Our investigation pertinent to the relative importance among research constructs further showed that mental health value has a prominent influence on airport worker loyalty. Indeed, Fisher's Z test revealed that mental health value had a statistically stronger effect as compared to other variables ($p < .01$). Practically, recognizing its criticality, airport executives should spend diverse efforts on relieving workers' stress/anxiety and providing a better working environment. Workers' increased perception of mental health value through such efforts can eventually bring the enhanced worker loyalty for the airport. Theoretically, researchers should actively make a use of mental health value as a core concept when developing a conceptual framework related to airport workers' loyalty and behavior.

5.4. Occupant type and its importance

Findings from the metric invariance test showed the empirical evidence regarding the moderating effect of occupant types at an airport on the relationships between natural surroundings and mental health value, between natural surroundings and image of the airport, and between mental health value and loyalty for the airport. Specifically, the relationship strength between natural surroundings and mental health value ($\beta_{visitors} = .410$, $p < .01$; $\beta_{workers} = .180$, $p < .05$) and the relationship strength between natural surroundings and image of the airport ($\beta_{visitors} = .370$, $p < .01$; $\beta_{workers} = .108$, $p > .05$) were greater in the visitor group than in the worker group. This result implies that at a similar level of performances of natural surroundings, airport visitors perceive stronger mental health value than airport workers and build more positive image of the airport than workers. Meanwhile, the relationship strength between mental health value and

loyalty for the airport was greater in the worker group than in the visitor group ($\beta_{visitors} = .430$, p < .01; $\beta_{workers} = .570$, p < .05). This result implies that at the similar level of perception of mental health value, workers build stronger loyalty for the airport than visitors.

This result regarding the moderating influence of airport occupant types provides meaningful insights for both tourism researchers and airport practitioners. Our findings offer theoretically and practically critical information that an airport's natural surroundings as the constituent of its green atmospherics had the different level of importance across occupant types when relating to mental health value and airport image. The present research also established the fact that an airport's natural surroundings are more influential on visitors' mental health enhancement and their image improvement about the airport as compare to workers. The value of this research was also elevated as this was the first empirical study demonstrating that mental health value contributes to loyalty increase in a dissimilar way between visitors and workers. Airport workers' mental health value was more likely to result in loyalty increase than that of visitors. Understanding the difference between visitors' and workers' responses, airport executives and operators need to invent loyalty enhancement strategies that are differential for visitors and workers. This endeavor would contribute to increasing the occupants' mental health value, image, and loyalty in an effective way.

5.5. Crucial mediating role of study variables

Our close examination of the indirect relationships among research variables revealed that specially-designed green spaces and natural surroundings included a significant indirect influence on occupants' loyalty for the airport. This implies that both mental health value and image significantly mediated the effect of green atmospherics as NBS on loyalty for the airport

in the visitor and worker groups. From the managerial perspective, in order to make the maximum use of green atmospherics as NBS efforts for eliciting visitors' and workers' positive responses/behaviors, it is essential for airport executives to efficiently deal with mental health value and image of the airport. In addition, recognizing the criticality of these variables, the allocation of financial/non-financial airport resources toward reducing visitors' and workers' anxiety/stress and boosting well-being perception while staying at the airport and toward increasing airport image/reputation should occur. From a theoretical aspect, being aware of the mediating nature of mental health value and image, researchers should make the active utilization of these mediators when developing, extending, and deepening diverse theoretical frameworks pertinent to NBS.

5.6. Limitations and future research

As in many other quantitative studies, this study contained few limitations. The first limitation was related to sampling. Our hypothesized conceptual frameworks were evaluated by utilizing convenience samples of airport visitors and workers at international airports located in metropolitan cities of South Korea. Therefore, the generalizability of the results from this research is somewhat limited. For the enhancement of the generalizability, future research should employ a wider range of sampling in broader geographical areas. The second limitation was associated with explanatory ability. As indicated earlier, the prediction power of the proposed research framework for loyalty among visitors was strong. Yet, the proposed framework in the worker group included somewhat weaker ability in predicting loyalty as compared to the visitor group. Future research should further fortify the prediction power in the worker group by expanding the proposed conceptual framework. Lastly, although our sample size for visitor and

worker groups exceeded the suggested size of 200 when using the structural analysis (Hair et al., 2010), the increase of the sample size is needed for future study in order to enhance the efficacy of the use of the structural equation modeling.

6. CONCLUSION

Indisputably, maximizing visitor and worker loyalty is one of the most crucial challenges for airport business. Given that very little is understood about the combined role of green atmospherics as NBS, mental health value, and image in inducing loyalty behaviors, the present research effectively addressed this omission through the empirical approach. Our research provided an enhanced comprehension of specially-designed green spaces and natural surroundings of an airport and their effect on succeeding variables and loyalty for the airport in an apparent manner both among visitors and among workers. Moving one step beyond in the extant airport business and tourism literature, the present study successfully developed valuable theoretical frameworks embracing NBS and airport occupants' responses and presented the better understanding of the convoluted procedure of the occupants' loyalty generation.

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Table 1–1. Measurement model assessment for the visitor group (n = 280)

	(a)	(b)	(c)	(d)	(e)	CR	AVE	Mean (SD)
(a) Specially-designed green spaces	1.000					.948	.819	4.035 (1.275)
(b) Natural surroundings	.665[a] (.442)[b]	1.000				.839	.568	4.404 (1.076)
(c) Mental health value	.558 (.311)	.558 (.311)	1.000			.939	.793	4.098 (1.323)
(d) Image of the airport	.476 (.227)	.463 (.214)	.503 (.253)	1.000		.938	.835	4.981 (1.141)
(e) Loyalty for the airport	.490 (.240)	.497 (.247)	.688 (.473)	.753 (.567)	1.000	.885	.657	4.635 (1.162)

Note. Goodness-of-fit statistics (visitor group): χ^2 = 348.002, df = 139, p < .001, χ^2/df = 2.504, RMSEA = .073, CFI = .958, IFI = .959, TLI = .949

[a] Correlations

[b] Squared correlations

Table 1–2. Measurement model assessment for the worker group (n = 250)

	(a)	(b)	(c)	(d)	(e)	CR	AVE	Mean (SD)
(a) Specially-designed green spaces	1.000					.913	.727	5.252 (1.409)
(b) Natural surroundings	.424[a] (.180)[b]	1.000				.841	.576	4.879 (1.438)
(c) Mental health value	.394 (.155)	.312 (.097)	1.000			.930	.769	4.408 (1.520)
(d) Image of the airport	.426 (.181)	.268 (.072)	.356 (.127)	1.000		.871	.693	5.976 (.952)
(e) Loyalty for the airport	.338 (.114)	.197 (.039)	.643 (.413)	.456 (.208)	1.000	.955	.840	4.632 (1.577)

Note. Goodness-of-fit statistics (worker group): χ^2 = 424.378, df = 139, p < .001, χ^2/df = 3.053, RMSEA = .078, CFI = .929, IFI = .929, TLI = .912

[a] Correlations
[b] Squared correlations

Table 2–1. Result of the measurement model evaluation for the visitor group (n = 280)

Hypotheses	Coefficients	t-values
H1a: Specially-designed green spaces → Mental health value	.275	3.262**
H2a: Natural surroundings → Mental health value	.423	4.583**
H3a: Specially-designed green spaces → Image of the airport	.244	2.788**
H4a: Natural surroundings → Image of the airport	.368	3.838**
H5a: Mental health value → Loyalty for the airport	.440	7.954**
H6a: Image of the airport → Loyalty for the airport	.660	12.058**

Indirect effect on loyalty for the airport:	Explained variance	Total effect on loyalty for the airport:
β Specially-designed green spaces = .282**	R^2 (loyalty for the airport) = .845	β Specially-designed green spaces = .282**
β Natural surroundings = .429**	R^2 (mental health value) = .422	β Natural surroundings = .429**
	R^2 (image of the airport) = .325	β Mental health value = .440**
		β Image of the airport = .660**

Goodness-of-fit statistics (visitor group):
χ^2 = 367.227, df = 142, p < .001, χ^2/df = 2.586, RMSEA = .075, CFI = .955, IFI = .956, TLI = .946

* p < .05, ** p < .01

Table 2–2. Result of the measurement model evaluation for the worker group (n = 250)

Hypotheses	Coefficients	t-values
H1b: Specially-designed green spaces → Mental health value	.354	4.844**
H2b: Natural surroundings → Mental health value	.178	2.359*
H3b: Specially-designed green spaces → Image of the airport	.447	5.984**
H4b: Natural surroundings → Image of the airport	.107	1.416
H5b: Mental health value → Loyalty for the airport	.570	9.353**
H6b: Image of the airport → Loyalty for the airport	.279	4.856**

Indirect effect on loyalty for the airport:	Explained variance	Total effect on loyalty for the airport:
β Specially-designed green spaces $= .327$** β Natural surroundings $= .131$*	R^2 (loyalty for the airport) = .476 R^2 (mental health value) = .212 R^2 (image of the airport) = .253	β Specially-designed green spaces $= .327$** β Natural surroundings $= .131$* β Mental health value $= .570$** β Image of the airport $= .279$**

Goodness-of-fit statistics (worker group):
$\chi^2 = 436.283$, $df = 125$, $p < .001$, $\chi^2/df = 3.072$, RMSEA = .080, CFI = .926, IFI = .927, TLI = .911
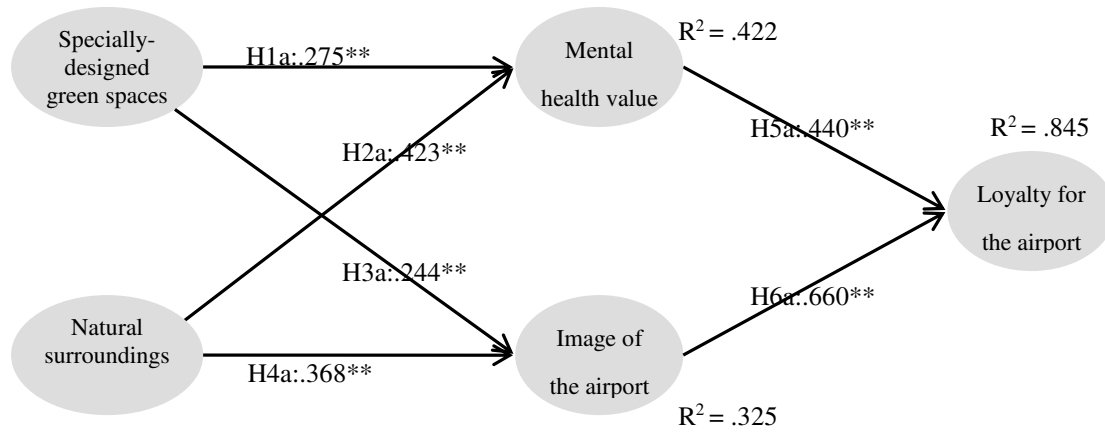
* $p < .05$, ** $p < .01$

Table 3. Result of the baseline model evaluation and invariance test

Hypothesized linkage	Visitor group (n=280)		Worker group (n=250)		Freely estimated baseline model	Constrained nested model
	β	t-value	β	t-value		
H7a: Specially-designed green spaces → Mental health value	.288	3.495**	.350	4.827**	χ^2 (298) = 827.284	χ^2 (299) = 827.738 [a]
H7b: Natural surroundings → Mental health value	.410	4.596**	.180	2.395*	χ^2 (298) = 827.284	χ^2 (299) = 833.485 [b]
H7c: Specially-designed green spaces → Image of the airport	.245	2.829**	.447	6.087**	χ^2 (298) = 827.284	χ^2 (299) = 827.955 [c]
H7d: Natural surroundings → Image of the airport	.370	3.941**	.108	1.483	χ^2 (298) = 827.284	χ^2 (299) = 836.637 [d]
H7e: Mental health value → Loyalty for the airport	.430	8.463**	.570	9.803**	χ^2 (298) = 827.284	χ^2 (299) = 840.062 [e]
H7f: Image of the airport → Loyalty for the airport	.669	13.115**	.277	4.895**	χ^2 (298) = 827.284	χ^2 (299) = 829.132 [f]

Chi-square difference test:
[a] $\Delta\chi^2$ (1) = .454, p > .05 (H7a: Not supported)
[b] $\Delta\chi^2$ (1) = 6.201, p < .05 (H7b: Supported)
[c] $\Delta\chi^2$ (1) = .671, p > .05 (H7c: Not supported)
[d] $\Delta\chi^2$ (1) = 9.353, p < .01 (H7d: Supported)
[e] $\Delta\chi^2$ (1) = 12.778, p < .01 (H7e: Supported)
[f] $\Delta\chi^2$ (1) = 1.848, p > .05 (H7f: Not supported)

Goodness-of-fit statistics (baseline model): χ^2 = 827.284, df = 298, p < .001, χ^2/df = 2.776, RMSEA = .058, CFI = .941, IFI = .942, TLI = .933

*p < .05, **p < .01

FIGURE 1. Evaluation of the hypothesized theoretical framework

Green atmospherics as
nature-based solution

Visitor group

Specially-designed green spaces

H1a:.275**

Mental health value

$R^2 = .422$

H2a:.423**

H5a:.440**

$R^2 = .845$

Loyalty for the airport

H3a:.244**

Natural surroundings

H4a:.368**

Image of the airport

H6a:.660**

$R^2 = .325$

Goodness-of-fit statistics (visitor group):

$\chi^2 = 367.227$, *df* = 142, p < .001, χ^2/df = 2.586, RMSEA = .075, CFI = .955, IFI = .956, TLI = .946

* p < .05, ** p < .01

Green atmospherics as
nature-based solution

Worker group

Specially-designed green spaces

H1b:.354**

Mental health value

$R^2 = .212$

H2b:.178*

H5b:.570**

$R^2 = .476$

Loyalty for the airport

H3b:.447**

Natural surroundings

H4b:.107

Image of the airport

H6b:.279**

$R^2 = .253$

Goodness-of-fit statistics (worker group):

$\chi^2 = 436.283$, *df* = 125, p < .001, χ^2/df = 3.072, RMSEA = .080, CFI = .926, IFI = .927, TLI = .911

* p < .05, ** p < .01

Mental health

value

FIGURE 2. Evaluation of the hypothesized moderating effect

Green atmospherics as
nature-based solution

N = 280 (visitors)

N = 250 (workers)

Specially-
designed
green spaces

H7a (NS):
.288** (V)
.350** (W)

Mental
health value

H7e (S):
.430** (V)
.570** (W)

H7b (S):
.410** (V)
.180* (W)

Loyalty for
the airport

H7c (NS):
.245** (V)
.447** (W)

Natural
surroundings

Image of
the airport

H7f (NS):
.669** (V)
.277** (W)

H7d (S):
.370** (V)
.108 (W)

Goodness-of-fit statistics (baseline model):

χ^2 = 827.284, *df* = 298, p < .001, χ^2/df = 2.776, RMSEA
= .058, CFI = .941, IFI = .942, TLI = .933

* p < .05, ** p < .01

S = supported
NS = not supported
V = visitors
W = workers