Urban Green Spaces During the COVID-19 Pandemic: A Correlational Analysis on Stress and Preferences of Gen Zs and Millennials in Pampanga

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ABSTRACT

The COVID-19 pandemic in the Philippines has caused the urban population to experience high levels of stress and other negative impacts to their wellbeing. Urban green spaces (UGS) are known to promote mental health, given the proper features. This study aimed to describe the usage and identify the preferred characteristics and activities of Gen Zs and millennials when visiting UGS in Pampanga. Online and field surveys used Nystrom's SCI-93 to identify the stress levels (a = 0.781), the preferred activities were classified using an instrument from China (a = 0.794), and 24 UGS characteristics was classified using the Perceived Sensory Dimensions (PSDs) to identify the preferred characteristics of the participants (a = 0.886). Descriptive analysis revealed that the majority (35.5%) of millennials and Gen Zs of Pampanga seldom visited UGS during the pandemic, and 29% stayed an average of 1 to 2 hours, often in sports and exercise areas (56.1%). Majority or 81% of the participants were found to engage in social and quiet activities, while public participation was least preferred wherein 69.2% mentioned they did not do this during the pandemic. Serene quality of urban green space is found to be the dimension that is most sought after with M = 4.5 using descriptive analysis, while UGS with Culture are least favored (M = 3.42). Correlational analysis found that stress levels are correlated with Refuge (r = 0.390), Nature (r = 0.261), Space (r = 0.256), Prospect (r = 0.251), and Serene (r = 0.213) dimensions. These findings will be crucial in designing UGS features to ensure that the preferences of the public will be integrated with planning to promote wellbeing during times of stress.

Keywords*: Urban green spaces, Stress, Activities, Perceived Sensory Dimensions. COVID-19 pandemic*

I. INTRODUCTION

The 2020 Census of Population and Housing (CPH) revealed that Pampanga's level of urbanization is currently at 75%, making it the fifth province that has a level of urbanization higher than the national level which is currently at 54.0% (Philippine Statistics Authority [PSA], 2022). The increased level of urbanization rate of the province from 67% in 2015 to 75% in 2020 can continue to increase with the development of Clark Green City as part of the 'Megalopolis' that Rep. Gloria Macapagal-Arroyo is planning

(Ayeng, 2021; Del Rosario, 2021). This rapid urbanization may lead to negative impacts on the wellbeing of the people and long-term environmental degradation. Materials to make infrastructure have been found to cause urban heat islands, while the increased CO_2 emissions and other pollutants from vehicles have changed the air quality and patterns of precipitation (Uttara et al., 2012). Social inequality is also prevalent in the city, where residents suffer discrimination and isolation due to economic and social factors. This fast-paced city lifestyle may provide economic progress but can cause extreme psychological stress to the citizens and increase the spread of infectious and non-communicable diseases (Arin et al., 2022; Meyer, 2019).

In addition to urbanization issues, the World Health Organization ([WHO], 2020) has reported that a pandemic outbreak has spread across the globe on the 11th day of March 2020 with the rise of individuals infected with Coronavirus Disease 2019. The Philippine government limited the mobility of the people by setting the nation into quarantine to contain the virus (Official Gazette of the Republic of the Philippines [OG ROP], 2020). In the Philippines, Tee et al. (2020, p. 379) stated that "a total of 13 to 16% of their respondents reported as stressed and have moderate-to-severe depressive and anxiety symptoms due to various factors of the pandemic". This was the finding based on the responses to the Depression, Anxiety and Stress Scales (DASS-21) of 1,879 Luzon-based Filipinos. Additionally, the stress of both being isolated, removed from their jobs, or exposed to the frontlines has an impact on their wellbeing and productivity (Barrot et al., 2021; Khatibi, 2021; Ramos & Prasetyo, 2021). This also led to severe anxiety being prevalent during the COVID-19 pandemic (Mendoza & Dizon, 2022) and COVID stress leading to depression and anxiety (Montano & Acebes, 2020). Filipinos then seek out safe ways to lessen the weight of this pandemic.

Globally, open green spaces were documented to have a significant increase in usage during the COVID-19 pandemic (Berdejo-Espinola et al., 2020; Geng et al., 2020; Ranada, 2020). Since the Spanish flu in the 1910s, open spaces have been recognized as safe places for patients as it lessens virus transmission. Studies have seen that urban green space (UGS) users that have their preferred qualities within a green space can significantly aid them in restoration (Grahn & Stigsdotter, 2009). These advantages of green spaces are crucial for urban areas where populations are higher and the rate of transmission of respiratory viruses is exponential to mitigate the long-term economic, physical, and mental health complications caused by the pandemic (Green et al., 2021; Jiang and McCoy, 2020).

Due to the importance of UGS, several frameworks have been created to investigate them further—some of them include the Attention Restoration Theory (Kaplan & Kaplan, 1989) and the Stress Reduction Theory (Ulrich, 1983). However, when studying how individuals perceive UGS and how they relate it to stress restoration, Grahn and Stigsdotter (2010)'s emerging Perceived Sensory Dimensions (PSD) framework may be of use. According to this framework, there are eight dimensions PSDs: *Nature* (spaces that evoke a sense of being in a natural environment, distinct from manicured urban settings), *Culture* (spaces characterized by the presence of cultural elements, historical significance, or designed features that reflect human history and

creativity), *Prospect* (spaces defined by open views and vistas over the surroundings), *Social* (spaces perceived as places that offer opportunities for social interaction, meeting people, and engaging in communal activities), *Space* (spaces experienced as open, spacious, and offering a feeling of freedom), *Rich in Species* (spaces characterized by a diversity of sensory experiences stemming from varied plant and animal life), *Refuge* (spaces experienced as a place of safety, security, and retreat), and *Serene* (spaces characterized by peace, quiet, and tranquility). This framework investigated the restorative effects of the environment in association with the wellbeing of humans. Theories derived from the framework have led to the formation of Supportive Environment Theory (SET) (Grahn et al., 2010, pp. 138-139) that emphasizes the relation of humans with the environment. This was developed by investigating the motivations, needs, and wanted experiences of the UGS users.

There is a lack of literature that describes the Filipinos' preferred qualities and activities when it comes to green spaces which can aid developers and planners in designing these areas for the people. It may be then of interest to identify the preferred characteristics and activities of millennials and Gen Zs on urban green spaces during the pandemic. The outlook of these generations is important when discussing UGS as they currently comprise 57% of the total population of the country (PSA, 2022). Moreover, these generations are both known for placing importance on both mental health (Baral et al., 2022), environmental values (Nowacki et al., 2023), and their intersection (Bratman et al., 2015).

Using the PSD framework, this study aimed to identify the preferred characteristics and activities of Pampanga's millennials and Gen Zs on urban green spaces during the pandemic. Specifically, this study aims to: 1) determine which green space/s do/es Gen Zs and Millennials in Pampanga prefer to go to; 2) determine the preferred activities of Millennials and Gen Zs when visiting urban green spaces; 3) determine the Millennials and Gen Zs' preferred characteristics of urban green spaces and; 4) determine the correlation between the level of stress and the perceived sensory dimensions (PSD) preferences of the participants in urban green spaces.

II. METHODS

A. Research Design

Using Johnson's (2001, p. 10) classifications on nonexperimental quantitative research designs, this study can be categorized as Type 8 research – that is, cross-sectional and explanatory. This is because it aims to explain a phenomenon, such as how the participants' preferred characteristics and activities on urban green spaces can be identified and be used in planning. Moreover, the study was conducted in a single time period only, which is during the pandemic; thus, making it a cross-sectional study.

B. Research Setting

The province of Pampanga is located in the center of the Central Region in Luzon. According to the Provincial Government of Pampanga's official website (2013), the land area of the province is 2 180.86 km² with Mount Arayat as the highest peak at 3 200 feet.

It is divided into 19 municipalities, namely Magalang, Floridablanca, Guagua, Lubao, Porac, Sasmuan, Santa Rita, Arayat, Bacolor, Mexico, Santa Ana, Apalit, Candaba, Macabebe, Masantol, Minalin, San Simon, Santo Tomas, and San Luis. It also houses three first class cities, namely Angeles City, Mabalacat City, and the City of San Fernando. Approximately 63% of its land area is said to be dedicated for agricultural purposes.

Pampanga, known for its rice and other agricultural products, is now a rapidly urbanizing province. According to the PSA (2022) data, there was a nine-percent increase in the urban population of Pampanga, excluding Angeles City, from 2010 to 2015. As of 2015, the province's urban population is 1.4 million or 62.7% of the population, while Angeles City's is more than 400 000 or 98.3% of the total population.

Despite this, various green spaces can still be located within its cities, such as public parks, playgrounds, and national parks. Being home to numerous subdivisions, these places always incorporate nature with their residences. Some examples of well-known green spaces that people go to are the Picnic Grounds in Clark, Mount Arayat National Park, Lubao Bamboo Hub and Eco-Park, Astro Park, and various mall grounds. In the following years, a project that is part of the Global Future Cities under the UK FCDO will be developing a place called the New Clark City, a green, sustainable, and resilient city in Pampanga (Del Rosario, 2020).

C. Participants and Sampling Technique

The participants for this quantitative research were selected through purposive sampling by disseminating a recruitment advertisement that lists the criteria for participants. The participants must be (1) a resident of Pampanga, (2) a millennial (born from 1981-1996) or an adult Gen Z (born from 1997-2004) (Dimock, 2019), and (3) has visited an urban green space in Pampanga at least once since the 16th of March 2020 until May 11, 2022. It must be noted that no participants can be minors and that only experiences of the participants during the pandemic were be noted. The study has collected a total of 107 valid respondents with 46 Millennials and 61 Gen Zs. According to Delice (2010), survey research with minor sub-groups should have a sample size of 20 to 50, and 100 samples for each major sub-group.

D. Research Instrument

The survey consisted of information on the principal researcher, the study, and the informed consent. All in all, the survey had four parts in order to identify the preferences of the respondents with regards to the urban green spaces in Pampanga. The first part inquired on the demographic profile such as their age, sex at birth, and city or municipality of residence, civil and employment status. The second part aimed to identify the respondents' self-reported health status during the pandemic. A 5-point Likert scale was used to evaluate the participant's self-evaluation of their physical and mental health level during the pandemic. Next, the level of stress was also measured having 7 symptoms from the SCI-93 by Nystrom and Nystrom in 2008 ranked as Not at all/Never, Little/Rarely, Moderately/Sometimes, Much/Often, Very much/Very Often. The instrument's Cronbach alpha coefficient is 0.781.

The third part of the questionnaire focuses on the urban green space usage and recreational activities that the respondents engaged in during the pandemic. Questions relating to the type of UGS, frequency of usage (FU), and duration of usage (DU) were surveyed. These items also focused on noting the activities, like sports, leisure, and public participation that the respondents did during their stay in the UGS. These were rated according to the time duration spent in activities; specifically, less than 15 minutes, 16-30 minutes, 31 mins-1 hour, 1-2 hours, 2-4 hours, and more than 4 hours. The Cronbach alpha coefficient was calculated to be 0.794. The last part of the questionnaire used 24 urban green space characteristics based on the study by Malekinezhad and Bin Lamit (2017). These were grouped according to: Nature, Culture, Prospect, Social, Space, Rich in Species, Refuge, and Serene. It also used a 5-point Likert scale from strongly disagree to strongly agree. This instrument has a Cronbach alpha of 0.886.

Prior to the proper data collection, a pilot test for the research instrument was conducted both through physical and virtual surveys. The results from this test were used to test the reliability of the instruments used. Moreover, suggestions from the pilot test respondents were incorporated prior to the official field work.

E. Research Procedures

The data for this quantitative research survey was collected in two ways: online/virtual or via pen-and-paper technique. For the online survey, the research instruments, together with the study description and informed consent was laid in a Google Form. These forms were disseminated with the participant advertisement through online social media platforms. A QR Code for the form was also available for possible participants to scan for convenience.

For the physical survey, the principal investigator conducted field work in various urban green spaces in Pampanga. The field data collection was done in hospital, mall and golf green spaces, neighborhood and cemetery green spaces, open lots, *tambayan* and playgrounds in neighborhoods, and the various public parks of Pampanga. The data was gathered from April to May 2022.

F. Data Analysis

The data collected were stored in the Google account of the principal investigator until the end of the study. Only the principal investigator and the co-investigator had access to the data. Means and standard deviation were used to compute the respondents' usage of urban green spaces during the pandemic. Frequency and percentage were computed to describe the most often type of urban green space visited, identifying the FU, DU, preferred activity and characteristics of UGS. These univariate and bivariate analyses answered the first three research objectives. Lastly, correlational analysis was also conducted between the LS index and the PSD index in order to address the fourth research objective. All analyses were run using IBM SPSS version 26.

G. Ethical Considerations

Prior to conducting the data collection, the principal investigator registered the study to the University Research Grants Office (RGAO) of the University of the Philippines Manila (UP Manila). The study was given an RGAO certificate with RGAO reference number RGAO-2022-0311. Both the principal investigator and co-investigator have also completed the Basic Research Ethics Training course

This quantitative survey followed all necessary measures to ensure that the study upholds the ethical standards of research. In both kinds of the survey made, the details of the investigator and the study were described to show transparency. Prior to the questions themselves, the survey included a consent form to inform the participants of their rights as participants. The study was purely voluntary, and they may opt out any time during the duration of the investigation. To add, the participants were guaranteed that the information that they will be foreclosing to the investigators will be entirely confidential. There were no foreseeable risks for this study.

The participants' identity is protected as there is no means for any of the data to be traced back to those who answered the survey. The data collected through the survey was stored immediately in the Google account of the principal investigator. The data is private and can only be accessed by the owner and the co-investigator. When the investigation is concluded at most after 3 months, the data collected was erased. Only the transformed data with the participant IDs will be stored.

III. RESULTS
A. Profile of the Respondents

A total of 107 participants answered the questionnaire. The Generation Z population was 61 and 27 of which are males while 34 are females. Meanwhile, the Millennials were 46 respondents, where 18 are male and 28 are female. Most of the participants were single (75.7%), while 20.6% reported being married. Of the 22 cities and municipalities in Pampanga, the study gathered 47 participants from Angeles (43.9%), 2 from Apalit (1.9%), 3 from Bacolor (2.8%), 1 from Candaba (0.9%), 2 from Guagua (1.9%), 19 from Mabalacat (17.8%), 7 from Mexico (6.5%), 12 from Porac (11.2%), 13 from San Fernando (12.1%), and 1 from Santo Tomas (0.9%).

Aside from these, the results from employment status show that 63 (58.9%) are employed, 38 (35.5%) are unemployed, and 6 (5.6%) work part-time. When asked regarding their perceived health status during the pandemic, 45 (42.1%) of the participants reported that their general mental and physical health during the pandemic was "moderate" and only 7 (6.5%) reported "very bad".

B. Urban Green Space Usage during the Pandemic

Of the seven types of urban green space types mentioned, 60 participants chose exercise/sports areas (56.1%) and 55 chose roof/house garden (51.4%) as the most frequently used. It was followed by neighborhood/roadside green spaces (51 or 47.7%), private green spaces (29 or 27.1%), and parks (25 or 23.4). Neighborhood playgrounds (20 or 18.7%) and *Bakanteng lote* or open lawns (17 or 15.6%) were the least visited by the respondents during the pandemic.

Results show that 67% of the respondents use UGS less than 3 times a month. This is further broken down to 38 (35.5%) of the respondents who reported that they seldom visit UGS and 34 (31.8%) visit 1-3 times a month. It was also reported that 15 (14%) visit weekly, while (14) 13.1% visit 2-6 times a week. Only 6 or 5.6% of the respondents visit UGS daily.

In terms of how long they spend when visiting, 31 (29%) of respondents spend around 1 to 2 hours, and 28 (26%) spend 31 minutes to 1 hour. This was followed by 2 to 4 hours (24 or 22.4%), 16 to 30 minutes (13 or 12.1%), and less than 15 minutes (8 or 7.5%). Only 2.8% or 3 of the respondents spend more than 4 hours using urban green spaces during the pandemic.

C. Preferred Activities in Urban Green Spaces

The activities done in urban green spaces are categorized as Social, Parent-Child, Fitness & Health, Sports & Leisure, Quiet, Public Participation, and Special/Other activities. Figure 1 presents the duration of doing the mentioned activities preferred by respondents. Quiet (81%) and social activities (81%) were found to be the most common things that 87 of the participants do in urban green spaces during the pandemic. Specifically, respondents mostly spend 31 minutes to 1 hour (24 or 22.1%) or 1 to 2 hours (24 or 22.1%) doing social activities. Meanwhile, quiet activities are mostly spent for 16 to 30 minutes (28 or 26.2%) or by 31 minutes to 1 hour (26 or 24.3%).

Next, sports and leisure activities are seen to have been done by 81 or 76.7% of the respondents. The duration that these respondents preoccupy themselves in this activity is mostly from 16 to 30 minutes (26 or 24.3%) and 31 minutes to 1 hours (26 or 24.3%). The fitness and health activities come next where 61 or 56% of the respondents reported having done these in UGS during the pandemic and spend 16 to 30 minutes (18 or 16.8%) doing these so.

Figure 1.
Graph Showing the Duration of Activities Done in UGS
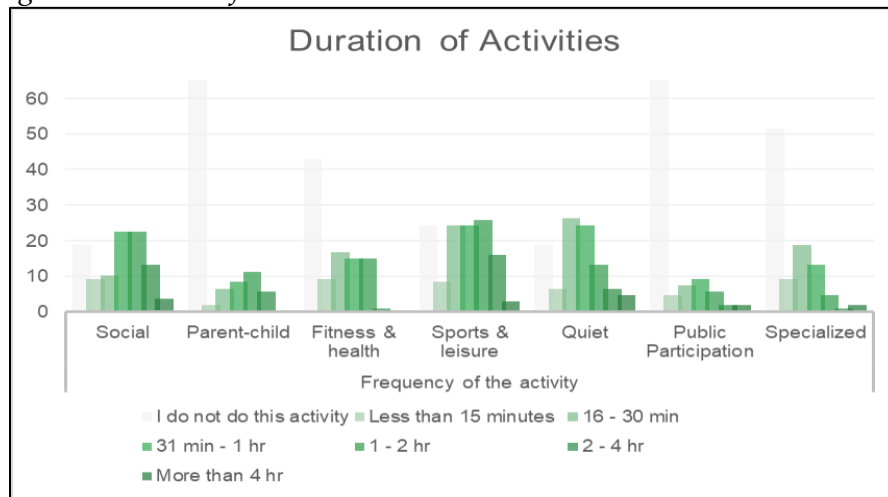
Parent and child activities may not be the most preferred activity done in urban green spaces, but it was found that those who do spend mostly 1 to 2 hours doing so. Specialized activities such as dog walking, kite flying, and others that cannot be categorized in the other six activities were done by 52 or 48.6% of the respondents. Results show that these activities are typically done from 16 to 30 minutes (20 or 18.7%). Lastly, the least preferred activity to be done in urban green spaces in Pampanga are public participation activities (i.e., charity work, tree planting, festivities) where 74 or 69.2% answered they did not engage in this activity.

D. Preferred Dimensions in Urban Green Spaces

Three characteristics from the survey each represent a perceived sensory dimension namely Culture, Nature, Prospect, Refuge, Rich in Species, Social, and Space. Table 1 presents the descriptive statistics of PSD. The highest total mean of the PSDs is from Serene with 4.50. This is followed by Space, Refuge, Nature, Rich in Species, Prospect, and Social. The lowest total mean, or the least preferred PSD is Culture with 3.42. It appears that the preferences of males and females are the same, as well as those of Gen Zs and Millennials.

Table 1.
Descriptive Statistics of the PSDs by Sex at birth and Generation Cohort (n=107)

PSDs	Sex at Birth	Generation Z		Millennial		Total	
		M	SD	M	SD	M	SD
Culture	Male	3.28	0.67	3.69	0.59	3.44	0.67
	Female	3.50	0.58	3.32	0.88	3.40	0.73
	Total	3.40	0.62	3.46	0.79	3.42	0.70
Nature	Male	4.06	0.77	4.1	0.80	4.09	0.78
	Female	4.04	0.63	3.99	0.87	4.02	0.74
	Total	4.05	0.69	4.04	0.84	4.05	0.75
Prospect	Male	3.90	0.85	3.74	0.95	3.89	0.88
	Female	3.77	0.66	3.71	0.76	3.75	0.70
	Total	3.83	0.75	3.72	0.83	3.79	0.78
Refuge	Male	4.25	0.71	3.94	0.90	4.13	0.80
	Female	4.09	0.64	4.06	0.74	4.08	0.68
	Total	4.16	0.67	4.01	0.80	4.10	0.72
Rich in Species	Male	3.69	0.83	4.13	0.61	3.87	0.78
	Female	3.68	0.79	3.86	0.83	3.76	0.81
	Total	3.68	0.81	3.96	0.76	3.80	0.79
Social	Male	3.68	0.64	3.78	0.73	3.72	0.67
	Female	3.67	0.62	3.57	0.80	3.62	0.70
	Total	3.67	0.63	3.65	0.77	3.66	0.69

Space	Male	4.48	0.55	4.41	0.59	4.45	0.56
	Female	4.27	0.65	4.07	0.96	4.18	0.80
	Total	4.37	0.61	4.20	0.84	4.30	0.72
Serene	Male	4.48	0.55	4.69	0.50	4.56	0.53
	Female	4.47	0.60	4.43	0.68	4.45	0.63
	Total	4.48	0.57	4.53	0.62	4.50	0.59

E. Relation of Stress Level on Preferences in Urban Green Spaces

The levels of stress (LS) were categorized into 3 factors: Fatigue, Irritation, and Stress. Of the symptoms, 33 or 31% answered they were often stressed during the pandemic, and 21 or 20% reported feeling stressed very often. On average, the respondents rarely felt stressed, and irritated and fatigue is never or rarely felt.

The results of this study discovered that stress levels have a relation with some perceived sensory dimensions (r = 0.237). It was found that stress levels of the respondents are significantly correlated with Refuge (r = 0.390), Nature (r = 0.261), Space (r = 0.256), Prospect (r = 0.251), and Serene (r = 0.213). It must be noted that all correlation coefficients are positive and weak to moderate. In other words, as stress level increases, preferences for the said UGS characteristic also increases. *Refuge* was seen to have the highest correlation with stress, indicating that those with the highest stress levels during the pandemic preferred urban green spaces that show qualities of safety, security, and refuge. It was also found that those who are less stressed during the pandemic preferred the *Serene* quality of urban green spaces.

IV. DISCUSSION

A. Usage and Activities of Urban Green Space Usage during the COVID-19 Pandemic

Similar studies have found reasons why residents seldom use urban green space during the pandemic. Lopez et al. (2021) reported that that this may be due to concerns about safety, accessibility, and a lack of desired features whereas Hou and Marzbali (2024) reported that this may be attributed to fear of COVID-19 contagion. Favored characteristics and accessibility for the public are undervalued and understudied in Filipino UGS settings (Mayuga, 2017). In addition, the digital generation composed of Millennials and Gen Z's, are mostly employees and university students. They are also attached to social media. These factors may give them limited time and opportunity for them to use UGS.

A study from Sweden found that physical activities in green spaces are a part of the self-reported indicators of wellbeing (de Jong et al., 2011). Results show that the common type of urban green space visited are sports and exercise areas. The pandemic has caused inactivity due to the work-from-home set ups and remote learning (Marinucci et al., 2021). Since the self-reported health status is moderate on average, the chosen millennials and Gen Zs are more inclined to visit exercise areas to improve their physical health (Evenson et al., 2016).

Additionally, the residents of Pampanga were found to prefer to do social activities in UGS. The pandemic was found to have reduced the adequate social levels of

people (Xie et al., 2020). Filipinos are social people and the lack of interaction during quarantine may have affected the psychological health of the Filipinos. Quiet activities, like reading books, people watching, and sunbathing, were another preference of the respondents. This is consistent with Gao et al. (2019)'s which reported that quiet activities rank as the second preferred activity done in urban green spaces in China.

B. Preferred Dimensions in Urban Green Spaces

Results of this study found that Serene is the most preferred dimension of the chosen millennials and Gen Zs of Pampanga during the pandemic, followed by Space. Serene environments are described as "A place replete with signs of care, clean and a quiet place with natural sounds offering soothing feeling" according to Memari et al. (2017). This result is parallel with the findings on the initial study on PSDs where Serene and Space are also the most preferred characteristics as it makes the UGS users experience nature (Grahn & Stigsdotter, 2009). Memari et al. (2017) explained that Space dimension is a spacious place where people may gather, areas that are not crossed by paths, and have numerous free-growing shrubs and trees. In the context of the pandemic, the feeling of being cramped in their residences as a consequence of the mobility restrictions. This can be mitigated by spacious green spaces where they can offer spaces to do social or quiet activities.

Social and Culture dimensions were the least preferred dimensions of the chosen millennials and Gen Zs of Pampanga during the pandemic. Social dimension is characterized by places with numerous places to sit, has plenty of movements from people, and generally has good lighting (Memari et al., 2017). Meanwhile, places of the Culture dimension consist of fountains, statues, and exotic or foreign plants. Studies explained that being in a city with higher population density can be a burden to an urban green space user, and the feeling of being in an artificial and man-made environment with plenty of movements will remind them of the stressors of being in a city (Gao et al., 2019; Grahn & Stigsdotter, 2009; Memari et al., 2017).

D. The Correlation of Stress Levels with the Perceived Sensory Dimensions

This study has found that the chosen millennials and Gen Z of Pampanga generally felt moderately stressed during the pandemic and is in parallel with the study by where it was also found how Filipino felt moderately to severely stressed during the pandemic (Tee et al., 2020). The current investigation also found that millennials' and Gen Z's levels of stress are correlated with certain perceived sensory dimensions of urban green spaces, namely: Refuge, Nature, Space, Prospect, and Serene.

Pálsdóttir et al. (2014) has explained that people who are stressed can sometimes look for secluded, or serene, places that offer privacy and freedom to overlook the surroundings. The feeling of being unsafe may cause higher levels of stress, thus cities that offer a place of refuge such as safe urban green spaces can help mitigate this. In the

pandemic context, stress can also be caused by the higher risk of transmission in urban places due to the larger population.

Aside from being sheltered from danger, it has long been reported that being with Nature can have various psychological benefits. As explained by the Attention Restoration Theory (Kaplan & Kaplan, 1989), natural environments are particularly effective at restoring directed attention as they offer a distinct contrast to the built environment and the demands of urban life which then leads to exploration, a sense of immersion, fascination, and contemplation. Additionally, Stress Reduction Theory (Ulrich, 1983), states that being in natural environments triggers a rapid and positive emotional response. In Japan, *shinrin-yoku*, or being immersed with nature, has proven to improve the effects of mental health illnesses (Song et al., 2018). In a large population study, UGS with Nature, together with Refuge and Serene are the three qualities that were found to be most associated with lower stress levels (Stoltz & Grahn, 2021).

Grahn and Stigsdotter's study also found the relation of Space and Serene to the levels of stress of UGS users, which is in line with this study's results. Space is an important characteristic for urban green spaces as it lets its users feel being "away" from the stressful factors of being in urban areas by providing a spacious untouched atmosphere. An UGS that is spacious may also complement the Refuge factor as it makes an UGS safer as it reduces close contact with other people, thus, lessens stress. As for Serene, a study with an evolutionary perspective has explained that the quiet and peaceful sounds of nature have been the inherent preference of human beings having resided with nature for thousands of centuries, and being in the urban landscape for the past decades surrounded by the sounds of traffic and other urban factors has caused stress for the people (Pálsdóttir et al., 2014).

Urban green spaces that have flat surfaces that provide multi-functional use reflects the Prospect dimension. When an UGS lets you see the horizon with minimal to no obstructions, it can be characterized as Prospect. Gao et al.'s study on the relationship between stress levels and perceived sensory dimensions has also found the existing correlation between the two. However, its results mentioned that the low to "medium" stressed groups prefer UGS with Prospect, while higher stressed groups prefer Serene. With the present study, it will be difficult to assume the correlation's level of strength towards the various stress level groups as all PSDs that were found to be correlated with stress levels all have weak correlation and can be changed through a variety of factors.

V. CONCLUSION

The preferences of residents in the Philippines with regards to urban green spaces have not been tackled despite the importance of having the public's participation when planning public green spaces. In the province of Pampanga where continuous urbanization is in effect, it was found that there were no significant differences in the usage and preferences of millennials and Gen Zs when visiting UGS during the pandemic. The people from ages 18 to 41 seldom visited UGS during the pandemic and preferred to use sports and exercise areas. Respondents mostly preferred social activities which is mostly chatting in person. However, they did not engage in public participation

activities because of restrictions to prevent higher risks of exposure to COVID-19. The characteristics of UGS were also identified using the PSDs. In order of most to least preferred PSDs are Serene, Space, Refuge, Nature, Rich in Species, Prospect, Social, and Culture. Interestingly, while the chosen participants preferred doing social activities in UGS, it appears that they mostly prefer the Serene (spaces characterized by peace, quiet, and tranquility) quality of UGS. A possible explanation to this discrepancy is that houses may have felt more stifling during the COVID-19 pandemic as it has become the location for chores, work, and studies; hence, they may be looking for peace and quiet; however, they prefer to do so while chatting with other people.

In times of crisis, such as a pandemic, the heightened stress level of urban residents coupled with the daily stressors of living in the city calls for the need to investigate ways to mitigate these impacts. This study found that Pampanga residents' stress levels are correlated with Refuge, Nature, Space, Prospect, and Serene qualities of UGS. Green spaces that prioritize these qualities may be able to help tailor-fit the needs of Gen Zs and Millennials when seeking areas of stress restoration that may improve their general wellbeing.

To increase the frequency and duration of the visits to UGS and lessen stress, this study recommends urban planners such as the Pampanga Provincial Planning and Development Office (PPDO) to integrate the features that the public prefers to maximize the benefits that green spaces can provide to the residents. Sports and exercise areas should be more accessible to the public, as it is the type of UGS that is most preferred to be visited by the population group caused by the sedentary lifestyle of urban residents. Lastly, UGS that offer security, untouched nature, wide and open space, and without the disturbance of external noises should be emphasized when planning UGS.

This study has certain limitations. One of which is that the sample was not randomly selected which implies that the conclusions of the study are not generalizable to the whole population of millennials and Gen Zs living in Pampanga. Secondly, the tool used to measure stress for this study (i.e., SCI-93 by Nystrom and Nystrom in 2008) was developed for a non-pandemic context. Lastly, this study was conducted during the COVID-19 pandemic.

Therefore, it is recommended that further research focus on a number of areas. This study may aid those wishing to investigate the association of the activities and the qualities that were mentioned, as well as other demographics and factors to fill the gap on the Filipino perspective. Studies on the motives and accessibility of urban green spaces in the Philippines is another study that needs to be investigated to add findings on what can encourage the Filipinos to visit UGS. Identifying which combination of PSDs in urban green spaces that can aid stress restoration is also a study worth investigating as it can help provide specific types of preferences that the residents favor. A longitudinal study reflecting different time periods will be helpful, such as comparisons prior to the pandemic and after the pandemic. To end, this study suggests the addition of the perspective of the vulnerable and marginalized as they are those who find UGS less accessible and deficient of features that benefit them as noted in SDG 11.7.

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