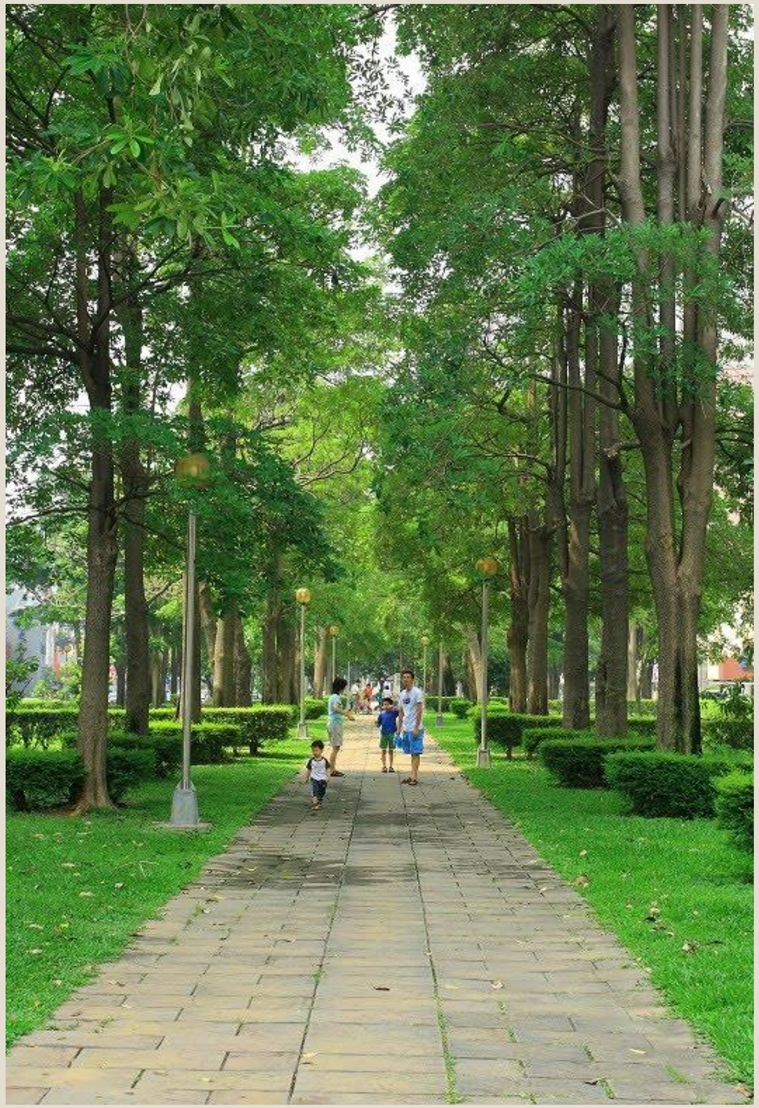
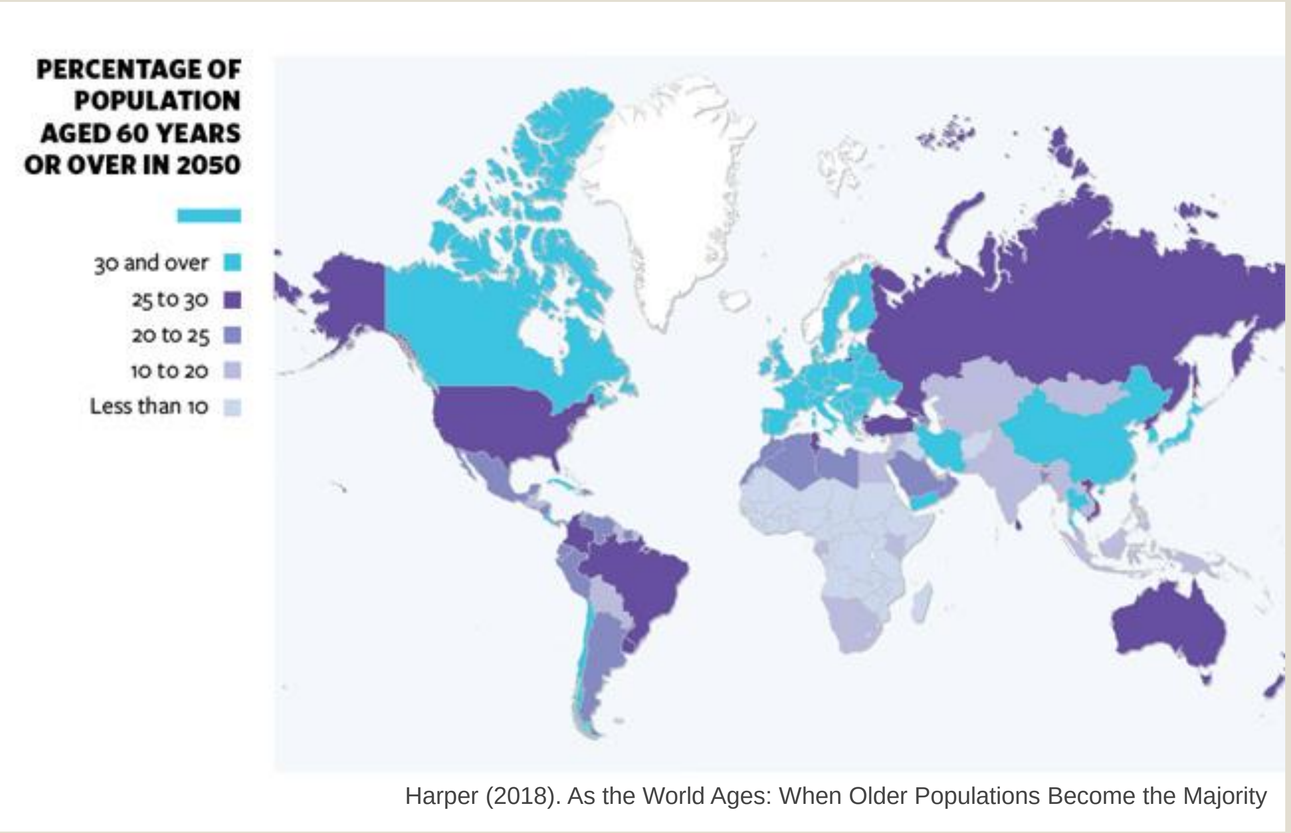


The links in quantity and quality of urban greenway, and outdoor activities among urban older residents

Po-Ju Chang, Assistant Professor
National Taiwan University



Harper (2018). As the World Ages: When Older Populations Become the Majority

AGEING AROUND THE WORLD

Global population of adults aged over 60 years is projected to grow by 56%, reaching 1.4 billion by 2030.

RAPID URBANISATION AROUND THE WORLD

More than half of the world’ s population lives in urban areas; expected to reach over 70% by 2050

URBANIZATION AND CITY GROWTH IN TAIWAN

78.2% of the Taiwanese population lives in urban areas.

TAIWAN, AN AGED SOCIETY WITH 14% OF PEOPLE OVER 65 YEARS OLD

Expected to become a super-aged society by 2025, over 20% of the population is over 65 years old.

114年進入超高齡社會，那時的您幾歲？

82年臺灣正式進入高齡化社會，預計於114年的65歲以上人口比例為20%，將進入超高齡社會，意即每5人就有1人達65歲以上。

臺灣人口高齡化分析

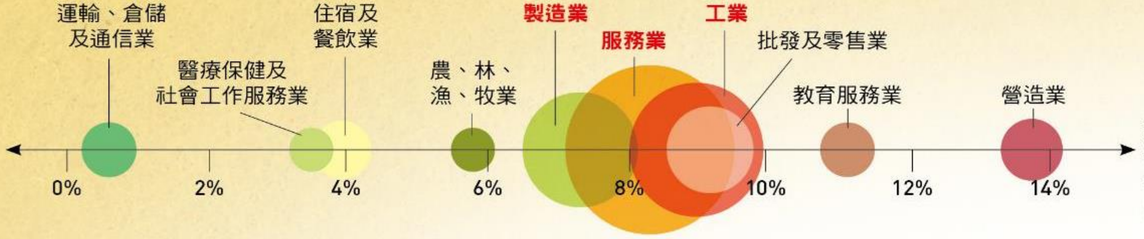
※資料來源：行政院國家發展委員會「2012年至2060年臺灣人口推估」

產業面

服務、製造、工業，三大產業面臨老化窘境

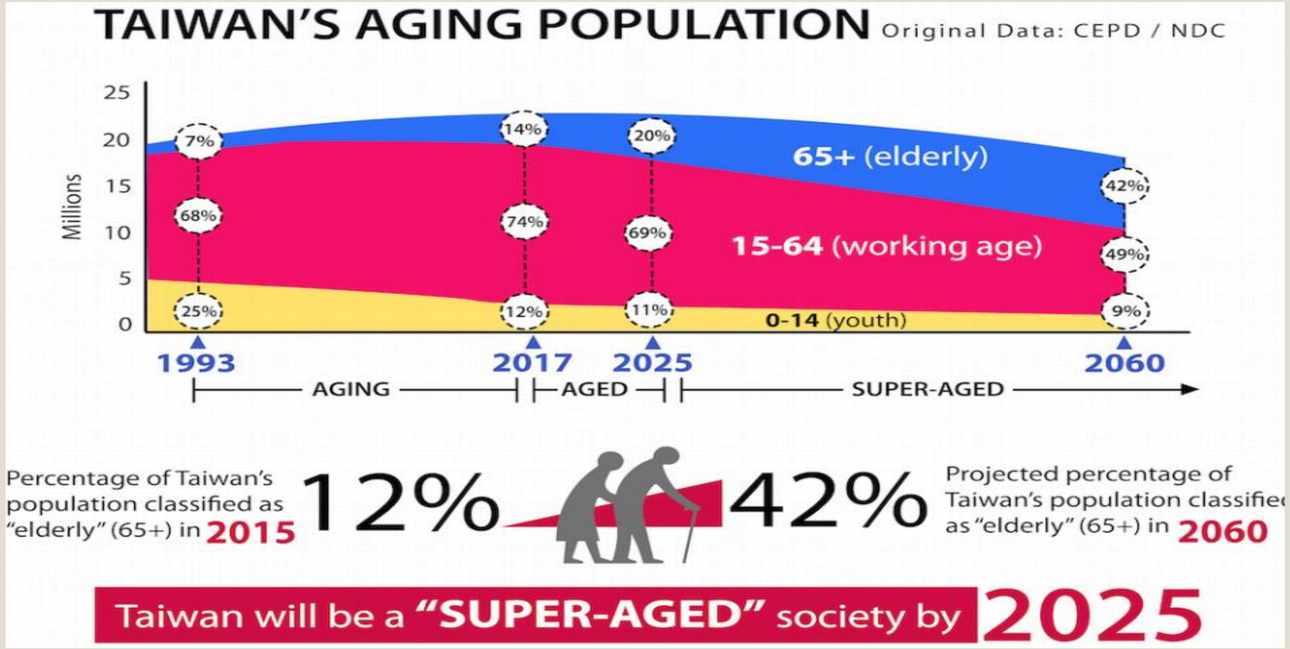
——老化速度前十大產業

以台灣目前十大勞動產業來說，前三大產業包含製造業、服務業以及工業，都面臨約7%～10%不等的勞動人口老化速度困境



註：圖為2004至2014年間，中高齡勞動人口（45～64歲）產業人口占比增減，計算公式為：（2014年45～64歲產業人口）/（2014年15～64歲產業人口）-（2004年45～64歲產業人口）/（2004年15～64歲產業人口）；圓圈大小代表產業人口規模

資料來源：行政院主計總處



"Among the 224 countries, Taiwan's fertility rate is the third lowest, ranking 222 in the world, only higher than Singapore and Macau."

The World Factbook 2017

"Taiwan has officially entered an aging society. The population over 65 years old accounts for 14% of the total population."

Ministry of the Interior 2018/04/10

Countries with lowest average total fertility rate

Country	Total fertility rate
Singapore	0.83
Macao	0.95
Taiwan	1.13
Hong Kong	1.19
Puerto Rico	1.22

The Use of Green Space

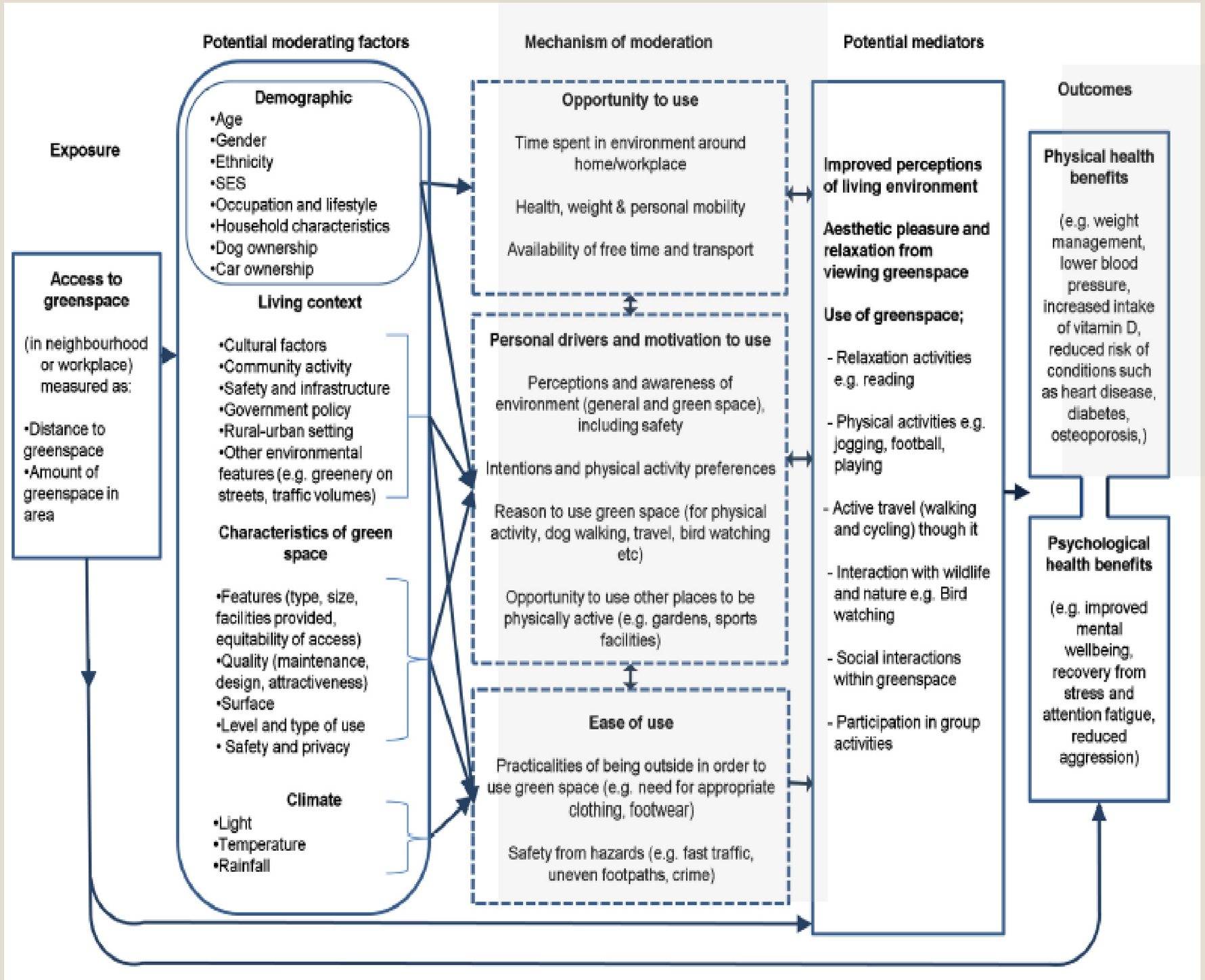
Leisure activities can enhance positive emotions, but engaging in such activities in natural environments may provide further benefits.

In contrast to the benefits of daily indoor leisure, the role assumed by nature in the positive association between outdoor leisure and quality of life may enable individuals to perceive novel and stimulating outdoor experiences as beneficial.

- Urban greenways provide older adults with environments to conduct recreational activities, which further their affection toward greenways and promote well-being.

- If a greenway is overcrowded, poorly maintained, or unsafe, users would exhibit negative perceptions.

Social ecological framework of green space and health (Lachowycz & Jones, 2013).



Mission

The link between urban environment and older residents

Urban Green Space

Studies have verified the relationship between green spaces and health, and urban parks partially fulfill the need for green spaces, greatly influencing residents’ health, well-being, and behavior.

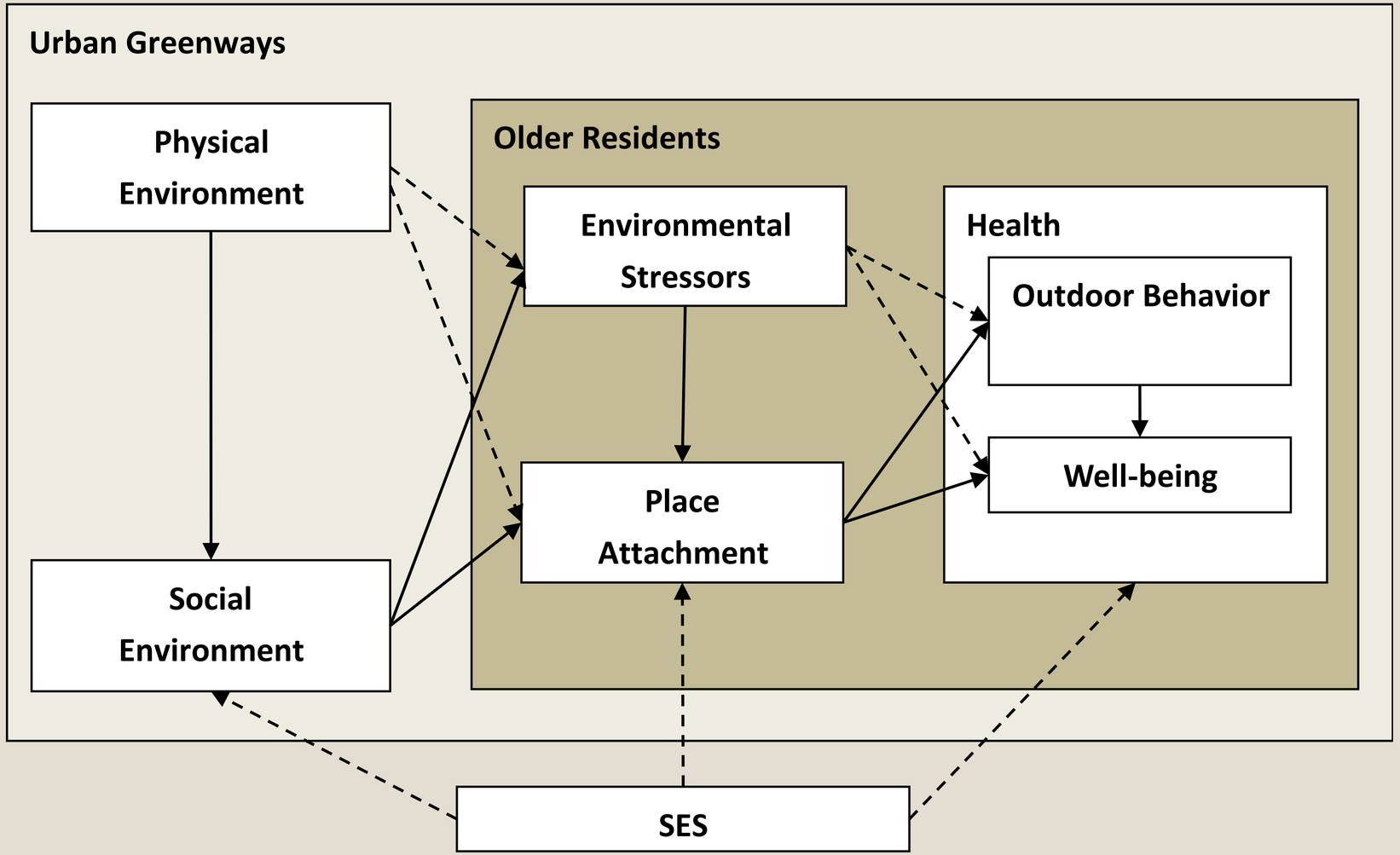
Aging in Place

The ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level.

Framework

Urban Greenway provide a physical environment for the elderly residents to engage in leisure, and shapes the social atmosphere of the neighborhoods, affecting the local residents' emotional and leisure behaviors, affecting happiness.

This study explores how the physical and social environment of 13 urban greenways in Taichung affect the relationships between local residents' attachment, outdoor leisure behavior and well-being, as well as environmental stressors, such as noise and air pollution.



My Works

Works

Project 1

Factors of urban greenways influencing the psychological well-being of older adults.

Works

Project 2

Roles of environmental stressors and place attachment in the relationship between tourists' emotions and behavioral intentions in the context of urban festivals.

Works

Project 3

The effect of physical environment in urban greenways on physical activity.

Urban Greenways, Taichung

Taichung

Total area: 2,215 km2.
Second largest metropolitan area of Taiwan.

Population

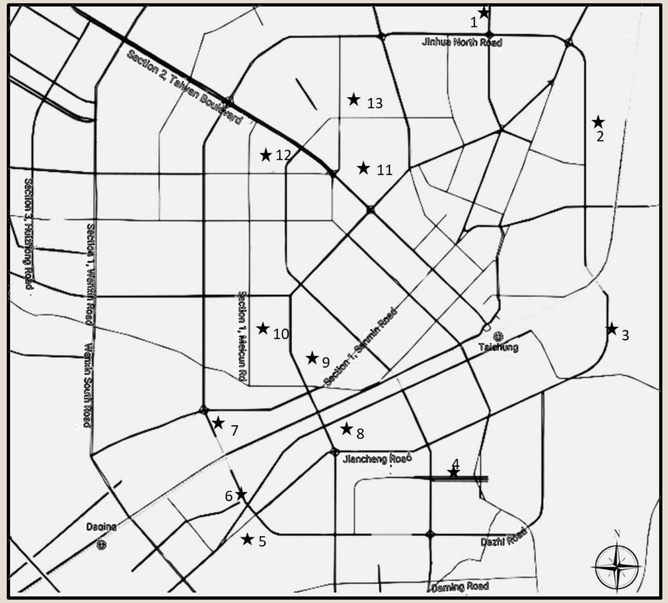
4.05 million people.
Age 65 and above: 11%.

Weather

Subtropical monsoon climate
Summer (26–33˚C), Winter (13–21˚C).
Average annual rainfall: 1,773 mm.
Average annual number of rainy days: 121 days.

Taichung , Taiwan

Region of Taichung



Study area：Taichung Urban Greenways (TUG)

1 Taiyuan Parkway
2 Shuangshi Parkway
3 Dongguang Parkway
4 Xingda Parkway
5 Shuyi Parkway
6 Zhongming Parkway
7 Chonglun Parkway
8 Fuxingyuan Parkway
9 Wuquan Parkway
10 Wuquan Parkway
11 Meichuan Parkway
12 Jingguo Parkway
13 Yude Parkway

Greenway System

Japanese colonial period.
completed the system in 1996.

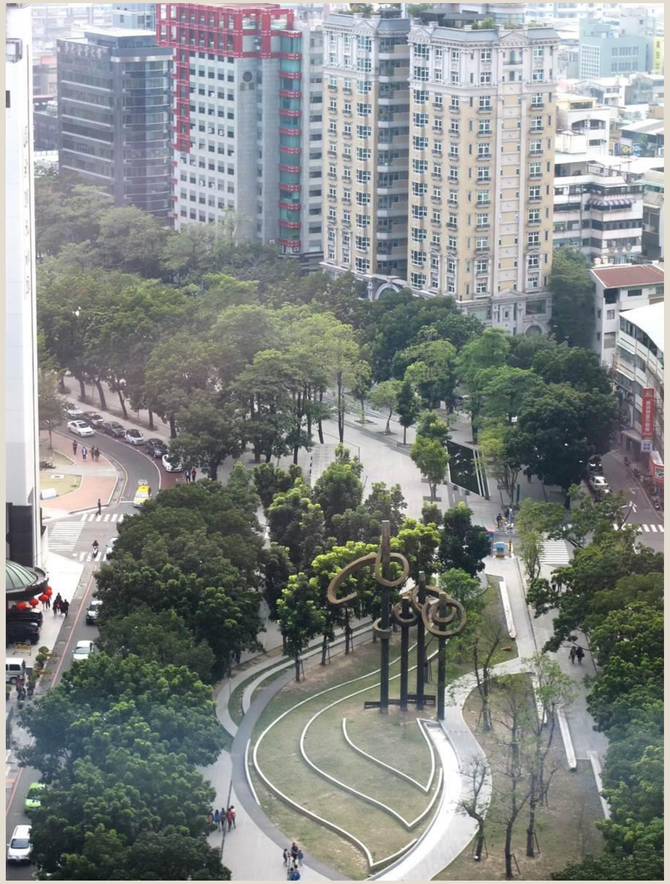
Size

13 greenways
From 5,000 to 98,000 m2

Facility

Walkways, bike trails, and exercise facilities
Larger ones have seats, squares, and rest areas.

Area: Taiyuan (4.23 ha), Yude (1.80 ha), Shuangshi (2.41 ha), Dongguang (4.60 ha), Xinda (4.33 ha), Shuyi (1.42 ha), Zhongming (2.36 ha), Chonglun (0.73 ha), Art (3.14 ha), Jingguo (9.80 ha), Wuquan (3.12 ha), Fuxing (0.70 ha), Meichuan (3.26 ha).



Greenway is defined as a linear open space that mainly serves as a path; it can be different widths of galleries or corridors that connect parks and green spaces in an urban area.

Urban Greenway Assessment

Date

October – December, 2017

Environmental Assessment of Public Recreation Spaces

EAPRS evaluates the availability of facilities and maintenance quality of a recreational space based on the usage condition, which consists of 17 main items, observed onsite by trained professionals (Saelens, 2006).

Factors in this study: Path quality, path quantity, natural quality, natural quantity, water element, seating quality, seating quantity, open space, facility, aesthetics.

A. Trails
3. Paved - Places to sit/rest

Aspect	Rating	Scaling	
1. Sit/rest places present	Yes No		Must be <25 feet
2. Type	Benches Tables Other		Circle all that appl
3. Seat material – benches	Wood _____ Metal _____ Plastic _____ Concrete _____		For each type of b 0, 1, 2-5, 6-10, or
4. Table top material – tables	Wood _____ Metal _____ Plastic _____ Concrete _____		For each type of t 0, 1, 2-5, 6-10, or
5. Condition	1 2 3	PEX	Refer to guideboo
6. Comfort	1 2 3	PEX	Must include abilit
7. Landscaping	Yes No		Refer to guideboo
8. Cleanliness	1 2 3	NATE	Refer to guideboo
9. Seat width	1 2 3		<1 feet, 1-2 feet, >
10. Coverage/shade	1 2 3	PER	Refer to guideboo

A. Trails
4. Paved - Access

Aspect	Rating	Scaling	
1. Access points	Number _____		Refer to guideboo
2. Parking proximity	1 2 3 4 5	PROX	Refer to guideboo
3. Entrance proximity	1 2 3 4 5	PROX	Refer to guideboo closest to a paved
4. Bollards/other barriers	Yes No		Refer to guideboo
5. Steps	Yes No		
6. Paved path to trail	Yes No		Consider any pave

Behavior of Older Residents

- From March 2018 to May 2018, average temperature: 27.3°C, average humidity : 77%. Sample: 769.
- Mean age: 67.4. Female: 59.9%.
- Fair (45.8%) or above average (44.0%) self-rated financial status.
- Live there more than 30 years (39.4%) or 11-20 years (22.4%); with partner (54.7%) or with partner and children (15.5%).
- Distance to the greenway: 0-100 meters (27.2%); longer than 500 meters (19.4%); 100-200 meters (18.6%).
- Townhouse (42.4%); high-rise apartment (33.2%); apartment (20.9%).

Individual Behavior

Frequency of outdoor activities on greenways.

Neighborhood social environment

Neighborhood social capital, neighborhood social cohesion.

Variables		Frequency	(%)
Gender	Male	308	40.1
	Female	461	59.9
Age	55-60	222	28.9
	61-65	157	20.4
	66-70	146	19.0
	71-75	92	12.0
	76-80	73	9.5
	80 and above	79	10.3
Marital status	Unmarried/separated/divorced	93	12.1
	Married	599	77.9
	Widowed	77	10.0
Education	Elementary school or below	193	25.1
	Junior high school	125	16.3
	High school	218	28.3
	College	199	25.9
	Master degree or above	33	4.3
Self-reported financial status	No income/ poor	61	7.9
	Average	352	45.8
	Fairly well-off or rich	356	46.3

PROJECT 1

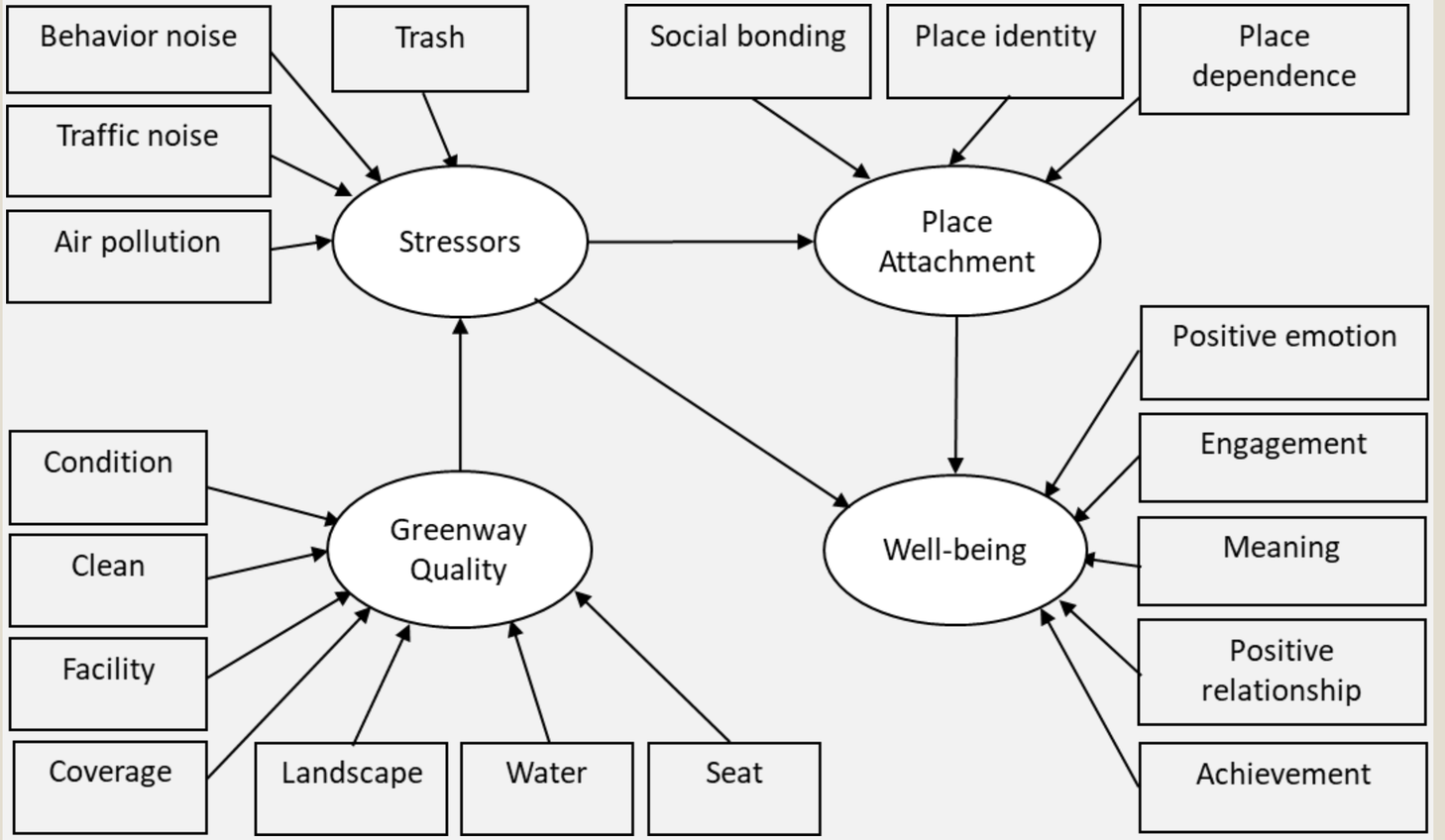
Factors of urban greenways influencing the psychological well-being of on older adults: A case study of Taichung, Taiwan

- Better urban greenway = better well-being?
- Pollution received from urban greenway affects well-being?
- More place attachment toward the greenway = better well-being?

Research Hypotheses

The greenway system in Taichung has been in existence since 1900. The Taichung government viewed this greenway system as a green infrastructure to compliment the beauty of the city and the residential area, as well as protect the city center from coal ash and dust. A place for residents to get involved in for outdoor recreation.

To achieve the goals of aging in place and successful aging, this study sought to determine environmental stressors of the greenway as perceived by residents, and the influence of residents' place attachment on their well-being.



Results

Greenway quality does not directly influence individuals’ well-being, but instead positively influences it through environmental stressors and place attachment.

Greenway

Well-being

Results

Greenway quality does not directly influence individuals' well-being, but instead positively influences it through environmental stressors and place attachment.

Stressor (R)

Greenway

Well-being

Results

Greenway quality does not directly influence individuals' well-being, but instead positively influences it through environmental stressors and place attachment.

Results

Greenway quality does not directly influence individuals' well-being, but instead positively influences it through environmental stressors and place attachment.

Stressor (R)

Place Attachment

Greenway

Well-being

PROJECT 2

Roles of environmental stressors and place attachment in the relationship between tourists' emotions and behavioral intentions in the context of urban festivals

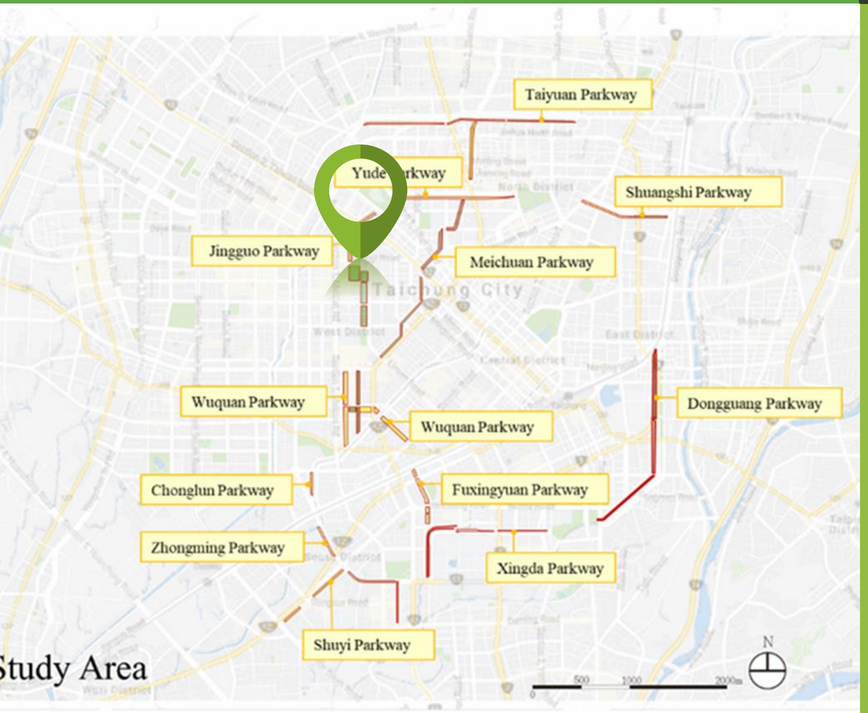
- More environmental Stressors = lower behavioral intentions?
- Emotions affects behavioral intentions?
- Place attachment toward the travel destination (urban greenway) affects behavioral intentions?

Taichung Jazz Festival

Hosted in yhe biggest urban greenway in Taichung since 2003

Measurement

PANAS, environmental stressors, place attachment, and behavioral intentions

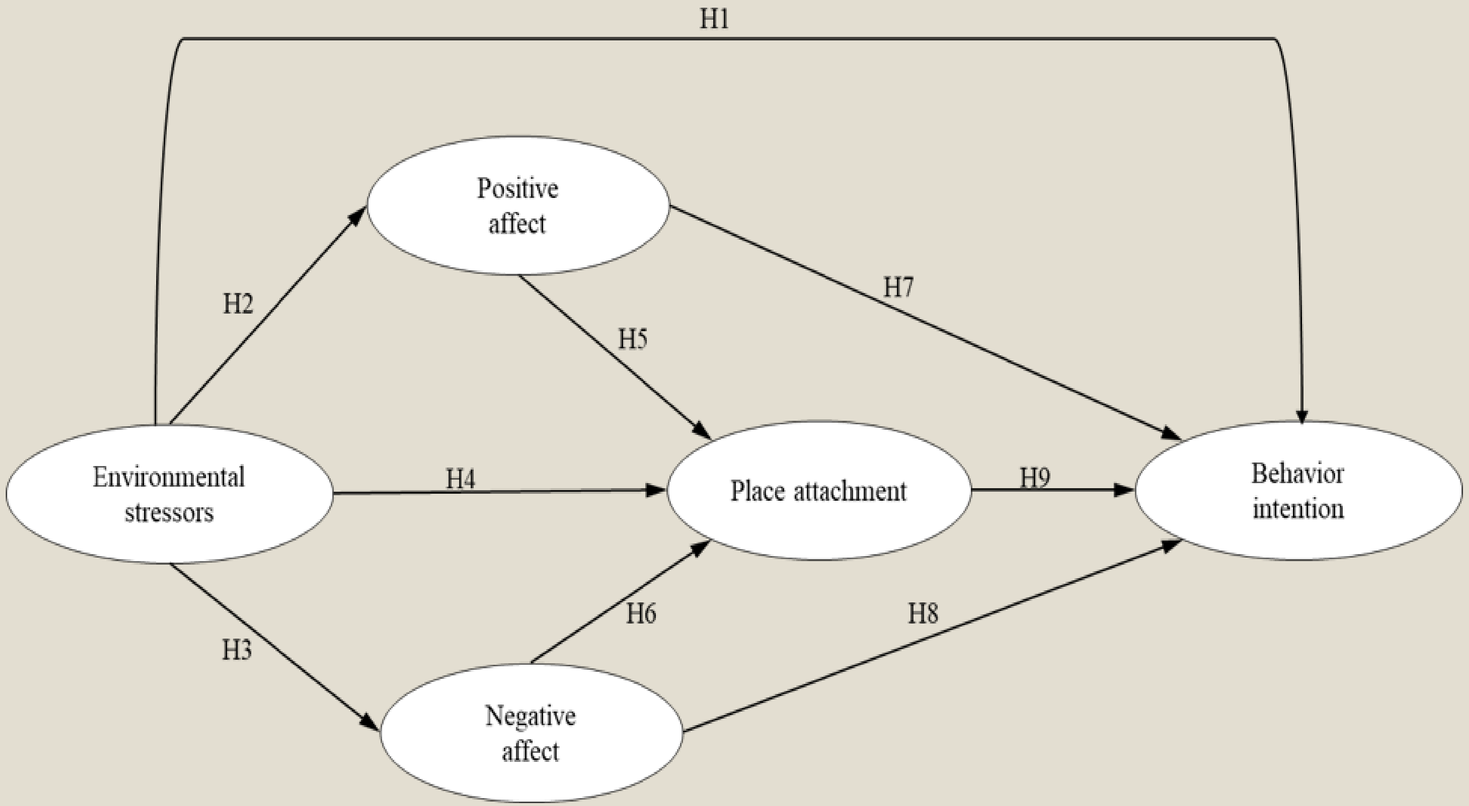


Data

Collected during the 2018 Taichung Jazz Festival in October.

Sample: 606

Research Hypotheses



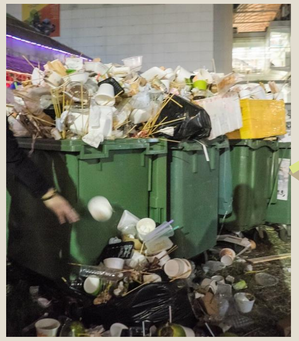
The Jazz Festival has averaged 800,000 attendees each year.

Users report negative perceptions if a greenway is overcrowded or poorly maintained. Tourists have positive experiences at this urban festival but feel stressed because of the environmental quality of the destination; affecting place attachment and behavioral intentions.

The purpose of this research was to deepen the understanding of the people–place psychological process as it relates to urban festival tourism on the basis of the theory of place attachment and environmental psychology.

Results

Findings highlight how environmental stressors are a strong predictor of all factors in the model of place attachment. In addition, positive emotions, negative emotions, and place attachment could mediate the effect of environmental stressors on other factors.



Stressor

Negative Affect

Positive Affect

Place Attachment

Behavior Intention

PROJECT 3

The effect of physical environment in urban greenways on physical activity

- The effect of landscape elements on urban greenways on physical activity across 28 units of urban greenways

Framework

Urban Greenway provide a physical environment for the elderly residents to engage in leisure, and shapes the social atmosphere of the neighborhoods, affecting the local residents' emotional and outdoor behaviors.

This study explores how the quality and quantity of 13 urban greenways in Taichung affect the relationships between local residents' outdoor leisure behaviors.

URBAN GREENWAY

Quality and quality of landscape elements

13 urban greenways,

28 units for environmental evaluation

USER BEHAVIOR

Frequency of outdoor activities

20~30 participants of on-site survey at each unit

LANDSCAPE DESIGN SUGGESTION

Design for active aging

Provide landscape design suggestions for urban green space for older population

Research Hypotheses

Level 1

Dependent factor:
Frequency of outdoor activities on greenways.

Aging in Place

Active Aging

Level 2

Independent factors:
Path quality, path quantity, natural quality, natural quantity, water element, seating quality, seating quantity, open space, facility, aesthetics.

Neighborhood social capital, neighborhood social cohesion.

Level 1 x Level 2 Interaction

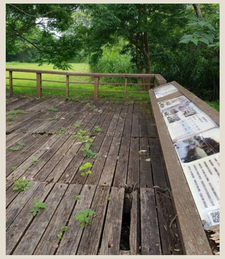
Outcome: Individual frequency of activity

Greenway social environment

Neighborhood social capital

Neighborhood social cohesion

Greenway physical environment: Quality



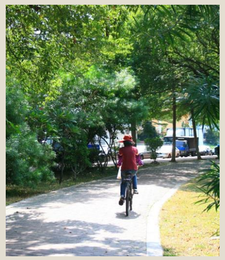
Path

Seating

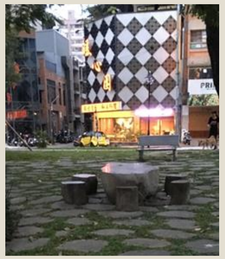
Nature

Aesthetics

Greenway physical environment: Quantity

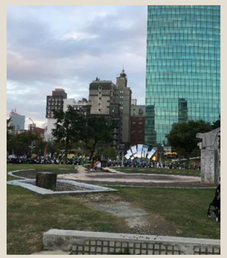


Path

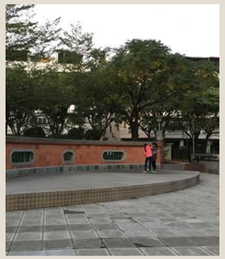


Seating

Nature



Water



Open space

Facility

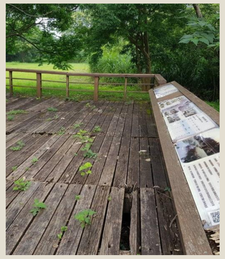
Outcome: Individual frequency of activity

Greenway social environment

Neighborhood social capital

Neighborhood social cohesion

Greenway physical environment: Quality



Path

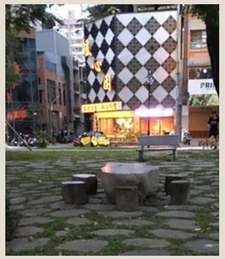
Seating

Nature

Aesthetics

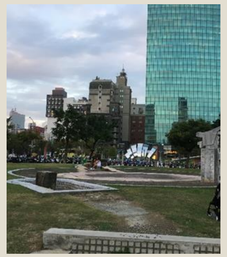
Greenway physical environment: Quantity

Path



Seating

Nature



Water

Open space

Facility

Outcome: Individual frequency of activity

Positive effect

Negative effect

Greenway social environment

Neighborhood social capital .520

Neighborhood social cohesion

Greenway physical environment: Quality

Path .152

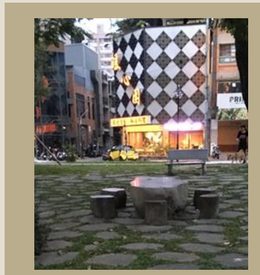
Seating .137

Nature .103

Aesthetics

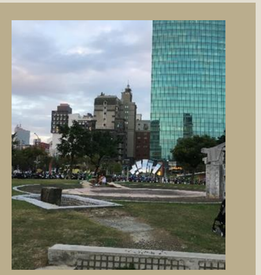
Greenway physical environment: Quantity

Path



Seating -.279

Nature



Water -.133

Open space

Facility

Discussion

Neighborhood social capital

Older adults may be willing to participate in more outdoor activities on greenways when their neighborhoods provide them with more resources or capital.

Path quality

Better quality of path encourages older adults to walk in the urban greenway without the fear of falling.

Natural quality

Older adults may appreciate natural elements in their urban surroundings when performing outdoor activities at greenways

Seating quality

Older adults may be more motivated to engage in activities after resting on well-maintained seats.

Seating quantity

The participants in this study all lived within 500 m from the nearest greenway. Their objectives for visiting greenways may be to perform outdoor activities.

Water element

Water features may not be attractive for older adults who enjoy engaging in outdoor activities at greenways because of the weather condition.

Water features might breed mosquitoes, possibly carrying the dengue virus, which causes the mosquito-borne viral infection

Future Suggestion

Suggestion

To create a high-quality and easy-to-maintain public space for older adults to enjoy the outdoors and improve their well-being without worrying about environmental stressors.

Urban

Designers should focus on the environmental quality.

Nearby Nature

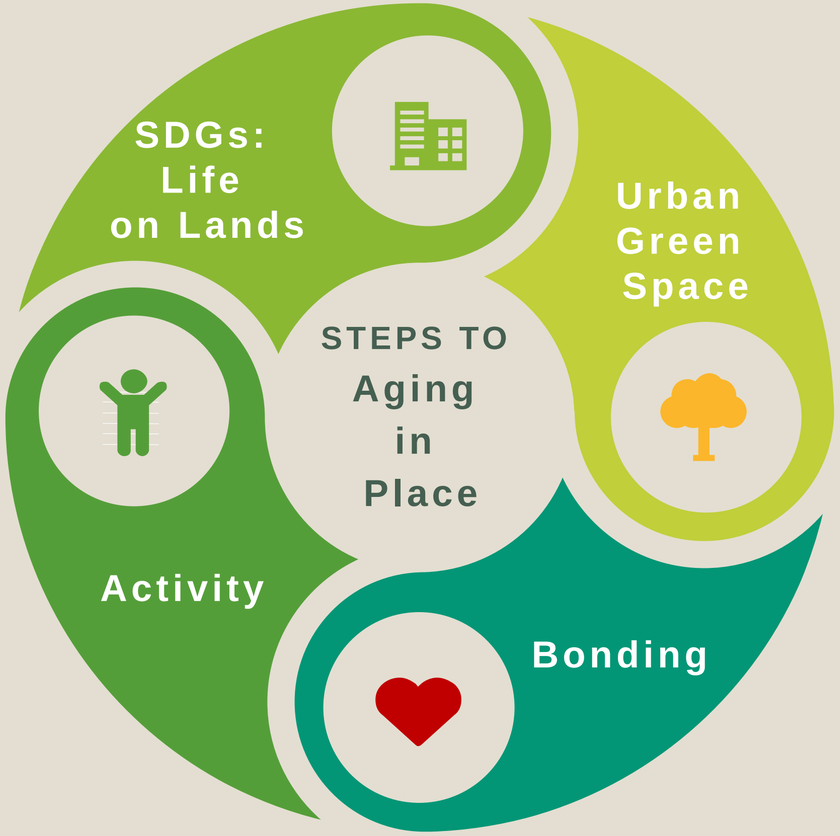
A natural environment for residents to engage in physical activities.

Activity

Seat and path are main elements for outdoor activities on greenways.

Bonding

Provide a sustainable social environment to increase positive emotions and place attachment.



Thank you!

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