

## Invigorating and Calming: The Yin and Yang of Singapore Parks

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### Overview

*Parks draw people for different reasons- as a green outdoor gym for physical activities, as well as a retreat for mental restoration by providing a space away from everyday life. This research seeks to quantify the level of physical activities and restorative benefits in three regional parks, and aims to provide insight on Singaporeans' preferred period for exercise, recreation and play.*

### Introduction

People's lifestyles in a society change with the evolution of the city's infrastructure. Singapore's reduced dependence on agriculture and manual labour, and a well-developed transportation network have led to a lifestyle with less physical activity. This change has implications on the population's health. According to the Health Promotion Board's (HPB) assessment published in 2012, only one in five (19%) Singapore residents- aged 18 to 69 years- participated in regular exercise during leisure time . The National Health Survey by the Ministry of Health in 2010 also revealed that 39% of Singaporeans were physically inactive and 11% were obese. In a densely built-up urban environment, parks play a role in providing an outdoor space for physical activities, which can help in reducing obesity.

<sup>1</sup> 54% did not exercise;  
27% irregular exercise

Conversely, parks provide a sanctuary for people seeking "restoration" or quiet time from the urban environment and busy schedules, where they also meet friends or family for socialising. Research has shown that those who live near parks or neighbourhoods high in green vegetation have the lowest health risks – cardiovascular disease (Richardson et al., 2013) and depression (Beyer et al., 2014). Parks function both as a green outdoor gym and a retreat, therefore comprising both invigorating and calming characteristics- the yin and yang. With these dual characteristics of parks, the usage of its amenities would be a subject that interests both planners and park managers.

### Methodology

We used two instruments- observations and onsite surveys- to study the activities and socialisation behaviour of park users. Riverine parks in three different estates- Bedok Reservoir Park, Bishan-Ang Mo Kio Park and Punggol Waterway Park- were selected to represent parks of different sizes and different population densities. The latter is closely related to the age of the housing estate (refer to Table 1). We studied riverine parks due to the interest in the new or recently upgraded parks, namely Bishan-AMK Park and Punggol Waterway Park. According to the Park Usage and Satisfaction Survey 2014 also conducted by CUGE Research, Riverine Parks were one of the more popular parks amongst Singaporeans. Understanding the activities and behaviour of park users would therefore be useful for future parks planning and design. The fieldwork was

conducted in-house by CUGE researchers over a three-month period from April to June 2014, with 3,989 observation data and 1,089 surveys representing a spectrum of park user groups.

The survey included both “use” and “user” questions. Use questions focus on characteristics specific to a particular visit, such as type of activity at the park today. User questions focus on characteristics not specific to a particular visit but that of a park user, such as the number of visits over a 30-day period. Data of both use and user will be presented in this report.

The level of physical activity carried out in the parks was studied via observations using a modified SOPARC<sup>2</sup> instrument. The SOPARC instrument was developed in the US and has been widely used across urban and rural parks (McKenzie and Cohen, 2006). This instrument records information such as the number of users for each user group, level of physical activity, gender and age. The intensity level of these observed activities were then categorised for this study, based on recommendations by the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC) in the US, and HPB.

<sup>2</sup> The System for Observing Play and Recreation in Communities (SOPARC) is a validated direct observation tool for assessing park and recreation areas, including park users’ gender, estimated age and physical activity levels.



Bedok Reservoir Park

**Table 1.** Profile of the Parks Studied

	Bedok Reservoir Park	Bishan-AMK Park	Punggol Waterway Park
Size	41 hectares	65 hectares	16 hectares
Age of housing	Developed pre-1980’s	Developed in the 1980’s and early 1990’s	Currently undergoing rapid housing and infrastructure development
Adult population in adjacent <sup>3</sup> district	423,000	213,000	42,000

<sup>3</sup> Living adjacent to the park implies a walk to the park from home which takes less than five minutes. It is determined by identifying surface streets and housing beside park boundaries.

## Park Users Tend to Lead a Healthy Lifestyle

Through the survey, we found that about half of the park users subscribed to a healthy lifestyle. Our survey asked respondents to rate<sup>4</sup> the level which best describes their current lifestyle and preferences. The questions ranged from adopting a healthy food diet, having a positive outlook on life, to liking indoors or outdoors. More respondents indicated they led an active lifestyle (52%) compared to those that led an inactive lifestyle (20%), on average, across all three parks. This is higher than the average Singaporean in which, based on HPB’s 2012 assessment, 19% of the population participated in exercise regularly. In addition, more park users saw themselves as a healthy eater (48%) than those who saw themselves as an unhealthy eater (17%), with the remaining in between across all three parks.

<sup>4</sup> Respondents were asked to rate which level best described how they felt, on a scale from 1 to 5, at the point of filling up the questionnaire. The results here have been collapsed from five groups to three.

On liking indoors or outdoors better, park users were more evenly distributed. These results suggest that parks also attract those who prefer indoor environments, as they provide a daily or weekly dose of the outdoors.

## Sweating in the Green Outdoor Gym

Respondents of the survey were asked to select one main reason for visiting the park that day. Exercise is the most popular reason to use parks (64%), followed by relaxation, socialisation, transport and programming, as indicated by **Table 2**.

**Table 2.** Main Reason for Visiting the Park

	Bedok Reservoir Park	Bishan-AMK Park	Punggol Waterway Park
Exercise	64%	62%	64%
Relaxation	22	21	20
Socialise	7	8	10
Transport - Short Cut	3	3	3
Programmes	1	1	1
Others <sup>5</sup>	3	6	2

<sup>5</sup> Other reasons to visit the park comprised: walking dog, site visit, dining, and school assignment.

Through our observations, we also found vigorous activity use<sup>6</sup> to be high and sedentary activity use to be the lowest proportion of park uses across the three parks. The higher level of participation in vigorous activities supports the role of parks as a green gym for park users.

<sup>6</sup> Vigorous level activity use includes cycling and jogging. Moderate level activity includes walking and exercise, such as stretching and using the outdoor exercise equipment. Sedentary activity includes sitting and eating.

## Most Popular Physical Activities

The most popular physical activity differed across the three parks, according to our park use data<sup>7</sup>. In the survey, park users were asked which activities they or those in their group were engaged in at the park during that particular day. As indicated in **Fig. 1**, jogging (53%) is the most popular in Bedok Reservoir Park, walking (50%) at Bishan-AMK Park, and cycling (52%) at Punggol Waterway Park.

<sup>7</sup> Park use data focus on visit characteristics specific to a particular visit.

**Fig. 1** Most Popular Activities in Parks



The most popular activities across the three parks reflect the varying physical design of the three parks. Bedok had high levels of jogging because of its multiple pathways around the reservoir, Bishan-AMK had high levels of walking on its extensive pathways along a riverbank; and Punggol Waterway had high levels of cycling on its pathways along the linear waterway.

### Activities By User Frequency

Frequent and infrequent users differed in the type of activities participated in during a typical park visit, as indicated in **Table 3**. We considered people who visited the park for at least once a week as frequent users. Those who jog and use the outdoor exercise equipment tend to be frequent park users. Those who enjoy the parks for sedentary activities such as eating at a restaurant, picnicking, or eating a quick lunch while on the job tend to be less frequent park users. Those who cycle or walk are a mixed group of frequent and infrequent park users.

**Table 3.** Activities by Frequency of Use

Activities associated more with frequent USE	Activities equally associated with frequent and infrequent USE	Activities associated more with infrequent USE
Jogging	Cycling	Sedentary activities (i.e., eating, sitting)
Use of outdoor exercise equipment/ Stretching	Walking	
	Walking the dog	

### ACTIVITIES BY AGE

Park users of different ages and life stages participate in different activities. **Fig. 2** presents age segment results for various activities by comparing against the overall mean.

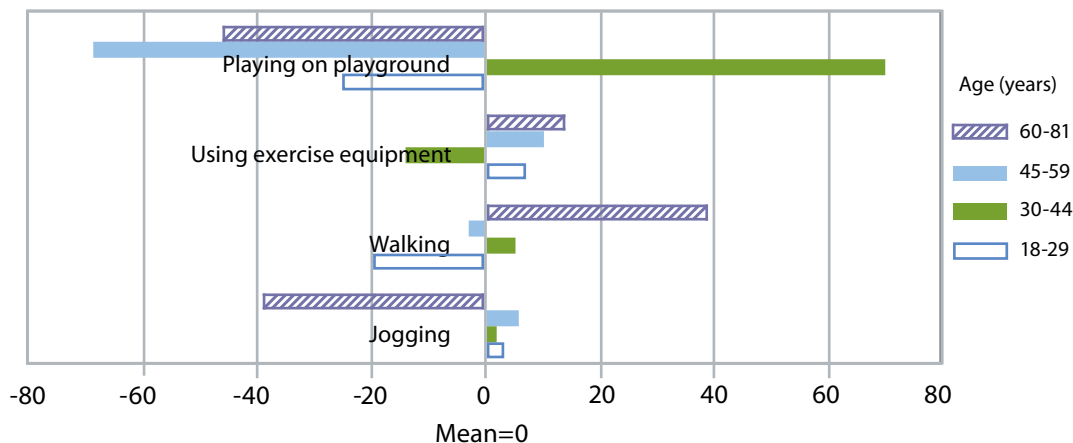
We found that park users aged 30 to 44 years old were the largest users of playgrounds as they tend to be parents of young children (**Fig 2**). Compared to other age groups, seniors (aged 60 to 81 years old) tend to walk and use the exercise equipment more. Seniors scored lower than average in activities like jogging as shown with graph bars found mostly on the left side or below the mean. Jogging, however, had no age segment patterns for park users other than for senior users.



Families having some splashing fun at Punggol Waterway’s water playground

Fig. 2 Activities by Age of Park User

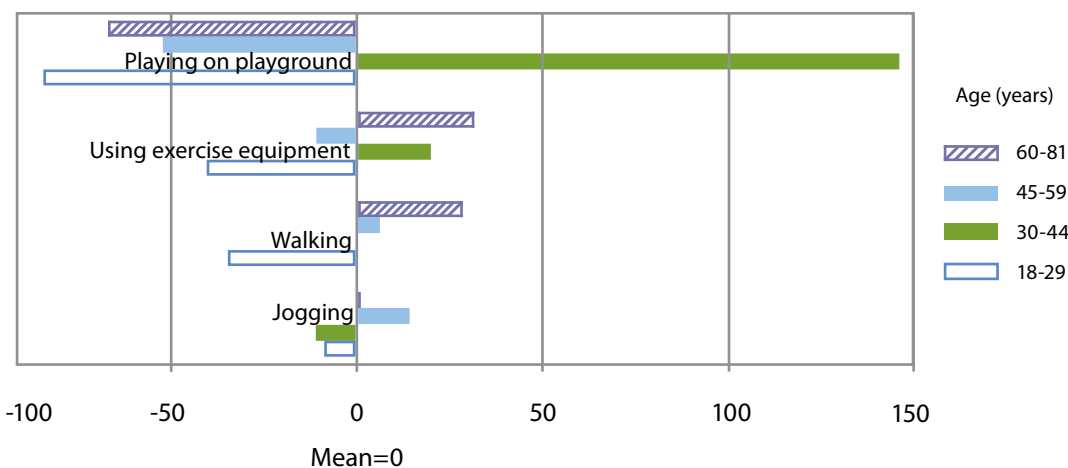
Bedok Reservoir Park



Bars on the right of the y-axis (x>0) represent age categories which are participating in a particular activity more than average, while bars on the left of the y-axis (x<0) represents age categories which are participating below average.

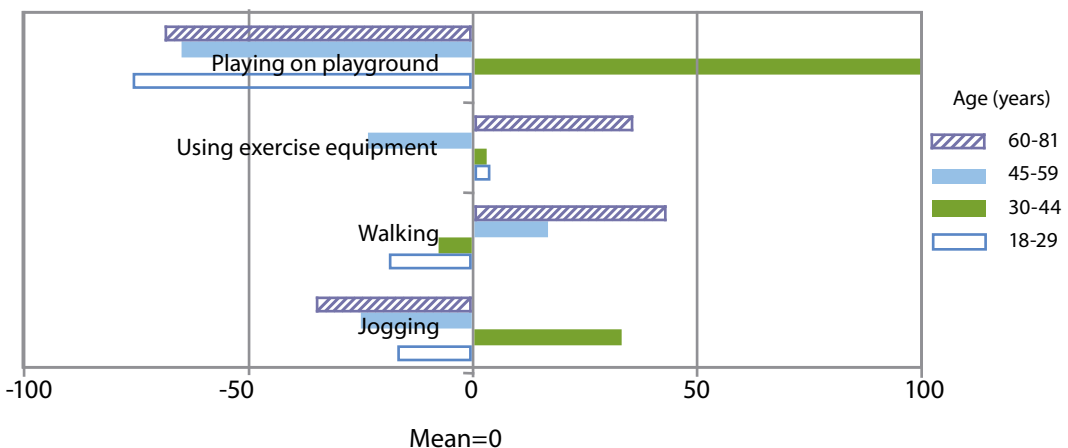
The usage of exercise equipment is highest amongst park users aged 30-44 and senior park users (aged 60-81) at Bedok Reservoir Park.

Bishan-AMK Park



Seniors comprise the highest number of walkers among Bishan-AMK park users; about 35% more than the average.

Punggol Waterway Park



Park users aged 30-44 are the "biggest" joggers amongst Punggol Waterway users, about 40% more than the average. For walking, middle-aged (aged 45 - 59) and senior park users participated higher than the average; with seniors being the "biggest" walkers.

## Parks as a Place for Retreat

The push-pull theory is commonly used to explain what motivates people to go out to parks. In this framework, push factors refer to the specific forces that influence a person’s decision to leave their house for the park, while pull factors refer to the forces that influence the person’s decision of which park is selected (**Box 1**).



Park users enjoying the morning breeze at Punggol Waterway Park.

With reference to Table 4, pull factors were found to be stronger motivational factors (mean=4.2) than push factors (mean=3.1). Greenery and tranquil areas were rated as the strongest factors which drew people to parks (refer to **Box 1**). Amongst push factors, “getting away from everyday life” was the strongest motivational factor. The high scores for these factors support the use of parks as a “resting bench”, and a respite from the flurry of everyday life by its users.

**Box 1.** Motivational Factors for Visiting Parks

Pull factors	Push factors
Greenery	Getting away from everyday life
Tranquil areas	Talking with family or friends
Trails and park facilities	Spending time with spouse or boy/girlfriend
Accessibility from home	Having fun with others
	Being around other people

**Table 4.** Results of the Pull and Push Factors which Attract People to Parks

	Bedok Reservoir	Bishan-AMK	Punggol Waterway
Pull	4.1	4.2	4.2
Push	3.1	3.0	3.2

Scale: 1=strongly disagree, 5=strongly agree

To study the mental restoration benefits of parks, this study also employed a short-length scale<sup>8</sup> by K. Korpela (Korpela et al., 2010), a psychology professor in Finland, who has numerous empirical studies of restoration (mental health) benefits in parks and forested areas. As indicated in **Table 5**, we found that Singaporeans scored high on a mental restoration scale (mean= 4.1), as compared to Finnish subjects (mean= 3.5). No differences between parks were found in achieving calming, alertness, or relaxation from a park visit.

<sup>8</sup> A short-length scale was adopted due to space constraint on the on-site survey questionnaire.

**Table 5.** Mental Health Outcomes from Park Use

	Bedok (n=385)	Bishan-AMK (n=359)	Punggol Waterway (n=345)
Overall restoration scale ROS	4.1	4.1	4.1
Specific Elements of "restoration"			
Calming	4.2	4.2	4.1
Restored and relaxed	4.2	4.2	4.1
New enthusiasm and energy for routines	4.0	4.1	4.1
Increased concentration and alertness	4.0	4.0	4.1
Worries forgotten	3.9	3.9	4.0
Clearing and clarifying thoughts	4.1	4.1	4.0

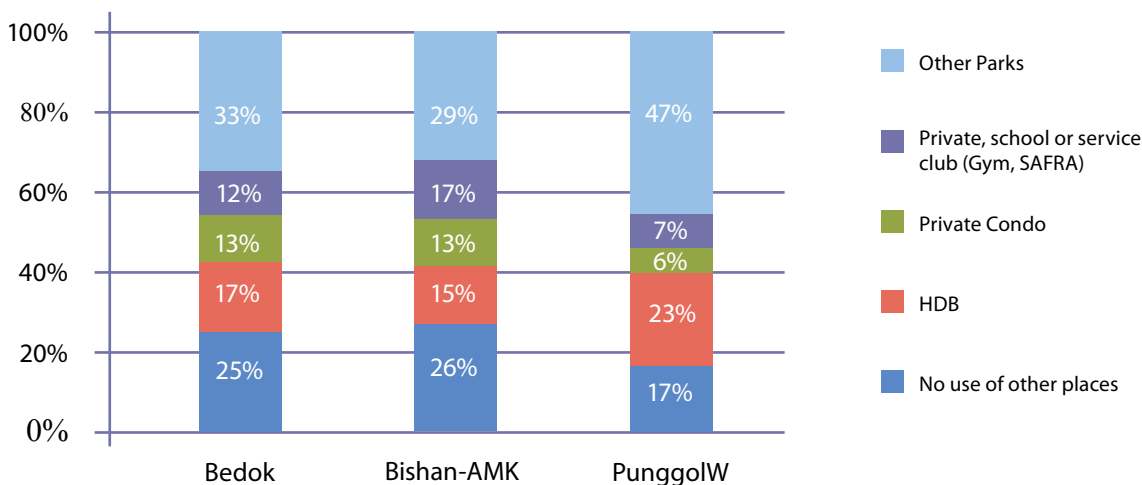
Scale: 1=not at all; 5=completely

### Where Else Do Park Users Recreate?

With more privatised recreation facilities such as private condominiums and gyms, parks face intense competition in attracting users. Understanding where else park users recreate can provide better understanding of what draws people to recreate at different facilities. Figure 3 shows the distribution of park users across the usage of parks and other recreation facilities.

Survey respondents were asked if they used any of the other places (including private gyms and HDB exercise equipment corner) in the past 30 days. For 17% of park users, the park which we intercepted them in was found to be the one-and-only recreation place.

**Fig 3.** Usage of Parks and Other Recreation Facilities in the Past 30 Days



Punggol Waterway had a higher proportion of users who visited other parks. This finding can likely be attributed firstly to, Punggol Waterway being connected to other nearby parks and a more extensive Park Connector Network (PCN) than the two other parks studied. Secondly, our findings suggest that some of its users are “variety seekers”, a segment of park users who are exploring new parks or visiting many parks.

## Conclusion

Parks can be thought of as places that help restore the urban citizen physically and mentally. Having an outdoor park setting near residential living encourages physical activity, which research has shown to reduce the rate of chronic diseases. In addition, it provides a space where people can retreat and recover from urban-associated mental fatigue.

Our findings show that the three parks studied have been indeed used as spaces for people to enjoy their daily dose of physical activity, as well as offer a restorative experience that helps refresh the mind. Firstly, exercise was the most popular reason to use parks, followed by other reasons such as relaxation and socialisation. Secondly, we also found that there is high level of vigorous and moderate physical activity across the three parks. Thirty-one percent of park users meet HPB’s recommendation of 75 minutes of vigorous level activities or 150 minutes of moderate level activities a week in just one visit. The type of physical activity which park users participate in differed based on their age. Seniors were found to participate in less vigorous physical activities; popular activities included walking and using the exercise equipment. Thirdly, the studied park users scored high on a self-reported mental restoration scale, with a mean of 4.1. These two functions of providing a physically invigorating and a calming space are not mutually exclusive, however, as mental restoration can take place regardless of the nature of an activity. In other words, parks possess the restorative qualities which benefit individuals who are either exercising or just resting.

## Recommendations

### Being the “Go-To” Place

Amidst increasing privatisation of recreation facilities, such as private gyms, clubs and condominium facilities, parks still possess the edge through the vast, open spaces they provide. The availability of a large outdoor space is something that private recreation facilities in land-scarce Singapore cannot replace. As the segment of people involved in physical activity requiring longer distances grows, there is potential relevance for the PCN to link and keep people within the park system. As such, there is a need for parks to earn the recognition as the go-to place to carry out such activities. Trails that link exercise venues, such as indoor gyms and outdoor tennis courts and swimming pools, to park facilities that encourage jogging and biking can provide a way to integrate different recreational activities. The PCN can offer such opportunities to residents in the heartlands, leading more of them to parks.

### Positive Messaging and Nudging

More partnerships with relevant agencies, such as HPB, can also be considered. Such initiatives would seek to motivate and nudge park users to adopt more physical activities as part of their daily routines. Another possibility would be to introduce more prompts and signage at the residential areas surrounding parks to encourage a more active lifestyle. Positive messages such as “exercise with family and friends for a great time of bonding” can be adopted to help motivate people to go outdoors and use parks to lead a healthier lifestyle.



## Locking People into Park Routines

Parks also need to consider fresh activities for users to engage in to increase their length of park use. One promising strategy is “locking” people into routines to become a frequent park user. This can be done through leveraging on the popularity of mobile applications used to schedule, learn training tips, and record their physical activities. Encouraging park users to keep track of their progress would provide people with the motivation to increase or sustain a desirable level of physical activity, as well as increase park visit frequency. Also, with an ageing population, parks can do more to cater to a segment of active seniors who use the parks for exercise to enjoy health benefits. Facilities popular amongst seniors, such as the Fitness Corner, must increasingly consider the needs of this growing segment of park users. Seniors will also benefit socially by being outside with others and not alone in their homes.

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## Additional Reading

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