

# Exploring Experiences With Nature Among Urban and Suburban School Children in Southeast Asia

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**ABSTRACT** Current rapid growth of urbanization has indirectly changed the trend of using leisure time among young people, including children. A decline in direct experience with nature can lead to disaffection of natural environments, wildlife, and public indifference towards biodiversity conservation. This unfortunate lack of contact may shift children's attitude towards nature conservation. However, research on childhood nature-related experiences and their effects are largely biased toward developed western countries. This study examined direct, indirect and vicarious nature-related experiences and surveyed both urban and suburban schools in Peninsular Malaysia. To assess their experiences with nature-related activities, a survey was conducted in 2016 among the school children aged 10 to 12 years old (N=401). The results of Generalized Linear Mixed Model (GLMM) analysis confirmed that the socio-demographic characteristics (gender, ethnicity, school locations) and having a pet significantly influenced children to actively participate in nature-related experiences. Exploring connections with nature both during childhood or present experiences help to identify biodiversity conservation opportunities, especially among urbanites. Besides, these findings could be integrated with planning programs to be implemented by environmental educators, city planners, and landscape managers. The direct nature-related experiences have remained as an essential element to improve children's attitudes, although vicarious experience has substituted direct contact with nature.

**KEYWORDS:** Malaysia; extinction of experience; conservation; pet ownership; sociodemographics

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## INTRODUCTION

Connection with nature have substantial positive impacts upon mental, emotional, and social development among children (Maller, 2009); behavior among people (Rajecki, 1982); and upon one's lifestyle to be healthier (de Vries *et al.*, 2003). Other than that, experience with nature during childhood is particularly essential to cultivate pro-environmental attitudes, behaviors, and moral judgments when attaining adulthood (Chawla, 2009; Lloyd *et al.*, 2008; Wells & Lekies, 2006). Experiences of nature vary widely across populations, but this variation is poorly understood. The understanding of childhood nature-related experiences is largely biased toward more developed Western countries.

In fact, screen-based entertainment has become a vital experience among children and this investigation is particularly urgent in developing countries undergoing rapid urbanization. This modern era and urbanized cultures, children have become more exposed to vicarious experiences. This 'virtual' trend could not be ignored (Pergams & Zaradic, 2006) and is defined as nature experienced vicariously via electronic. This type of medium (*via*. electronic media e.g., TV, computer games, and smartphones) influenced nowadays development and children connections with nature, thus generating a decrease among children to have direct contact with nature (Clements, 2004; Robison & Ridenour, 2012).

## BACKGROUND THEORY

### *Extinction of experience*

Urbanization had been widely discussed as a threat to biodiversity conservation. As more than two thirds of the world population have been estimated to dwell in cities by the year 2030 (United Nations, 2010), comprehending the effect of nature experiences is an urgent issue because such experiences have been declining at the global rate due to rapid urbanization and modern lifestyle changes (Miller, 2005; Soga & Gaston, 2016).

Nevertheless, the understanding of connections and experiences toward nature, especially the vicarious mode among children are limited towards developed Western countries, although nature-related experiences can vary between cultures and levels of urbanization. Further research into the influences on active free-play among children from a range of socio-demographic backgrounds is required. Thus, in the present 'extinction of the experience' era, it is imminent to understand how children in a tropical country relate to nature and how this association has changed over time, as well as within various socio-demographics. Exploring nature-related experiences are known to vary greatly according to sociodemographic factors, including gender (e.g., Änggård, 2011), residential or schools' area (e.g.; Hinds & Sparks, 2008; Zhang *et al.*, 2014; Mohamad Muslim *et al.*, 2017) and cultural differences (e.g., Milfont, 2012). Other than that, Prokop and Tunnicliffe (2010) previously mentioned having pets had a significant impact on the attitudes of children's toward animals. Therefore, this particular research focused to identify the common direct, indirect and vicarious or known as symbolic nature-related activities among school children in Peninsular Malaysia. Furthermore, research focused to examine the level of nature-related experiences differ between socio-demographics (including having pets) and finally determining if people school children who grew up in urban areas had fewer experiences than those who grew up in suburban areas.

## METHODOLOGY

### *Study Site Description*

Southeast Asia experiences one of the highest rates of deforestation in the tropics due to urbanization, agricultural expansion, logging and habitat fragmentation (Sodhi *et al.*, 2010), which expected had consequences not only in the extinction of species but also experience (Soga & Gaston, 2016). Within Southeast Asia, Malaysia is one of the most rapidly developing and urbanizing countries. The majority of people in Peninsular Malaysia are Malays (68.6%), followed by Chinese (23.4%) and Indian (7.0%) (Department of Statistics Malaysia, 2016). Islam is the official religion and one of the most important cultural features (Zainal Abidin & Jacobs, 2016) for Malaysian.

The survey on school children was carried out in November 2016 at selected elementary schools in Kuala Lumpur and Selangor which nearest to the adult's residential survey site as followed in the previous survey (Mohamad Muslim *et al.*, 2017). For the urban school, it has a certain percentage of urban parks, lake or garden in an urban area. While for the suburban area, schools are surrounded by various agricultural land including paddy field, river or oil palm plantation. Because this study used data with no identifiable information on the survey children, neither formal questionnaires were produced and administered jointly with, and approved by, the school's ethics approval nor written consent from their parents were required.

### Research Design

A preliminary survey was done before the main survey to confirm the activities are relevant for all generations. To assess their experiences with nature-related activities, we asked schoolchildren the frequency of the direct, indirect and vicarious experiences. For each type of experiences, responses were scored on a four-point scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often); and explained to the children that these items roughly correspond to “never experience the activities”, “almost every month”, “almost every week”, and “almost every day”, respectively.

The direct nature activities included were related to interactions with plants, animals, or soil. Playing in rivers and waterfalls, observing wild animals, collecting flowers and fruits, collecting seeds and twigs, eating self-collected fruit, climbing trees, making kites, fishing, sliding river banks and slopes, playing with soils or sands, making spinning top, making a flower crown, collecting herbs and weeds, catching frogs or spiders, making a bamboo gun or a boat from bamboo sticks or leaf, and catching insects were selected based on discussion with experts. Selection of the activities involved local environmental educators, and the website “Malaysia games without gadgets” (Traditional games in Malaysia, 2016) because they have probably been common among Malaysian children during the past 50 years or longer (Lat, 2006).

For the indirect experiences, only activities involved nature-related visitation such as natural forest, parks, beach, agriculture sites or wildlife-based conservation center were considered. To measure the frequency of vicarious experiences of nature, we focus on their frequency of reading books or watch TV programs about nature or wildlife, talk about nature or wildlife with parents or friends and play video game related to nature or wildlife.

### Survey Procedure

Every student that willing to participate will be given a questionnaire form and accompanied by a classroom teacher, the authors explained the purpose of the questionnaires. The briefing was conducted in the Malay language to avoid any confusion. In total, 401 (female = 193, male = 208) of school children participated from government school with a selected class from Standard 4 (10 years old) to 6 (12 years old). No right or wrong answer as the focused of this questionnaire is to evaluate the general perception of attitude how the school children experienced nature. No time limit was given during the completion of the questionnaire.

## RESULT AND DISCUSSION

The result suggests urban children involved more actively in vicarious nature-related experiences (mean  $\pm$  standard deviation:  $2.9 \pm 0.5$ ) than the suburban ( $2.8 \pm 0.3$ ). Nevertheless, it was found that suburban children are more connected to the direct ( $2.1 \pm 0.6$ ) and indirect nature experiences ( $2.4 \pm 0.3$ ) than urban children (Figure 1). This is consistent with the previous findings, which showed that suburban and/or rural children were experiencing more in nature than children who grew up in urban (Mohamad Muslim *et al.*, 2017; Mustapa *et al.*, 2018). Suburban children had an advantage of greater natural resource elements in their neighborhood and obtained the freedom to access and explore independently compared to their urban counterpart.

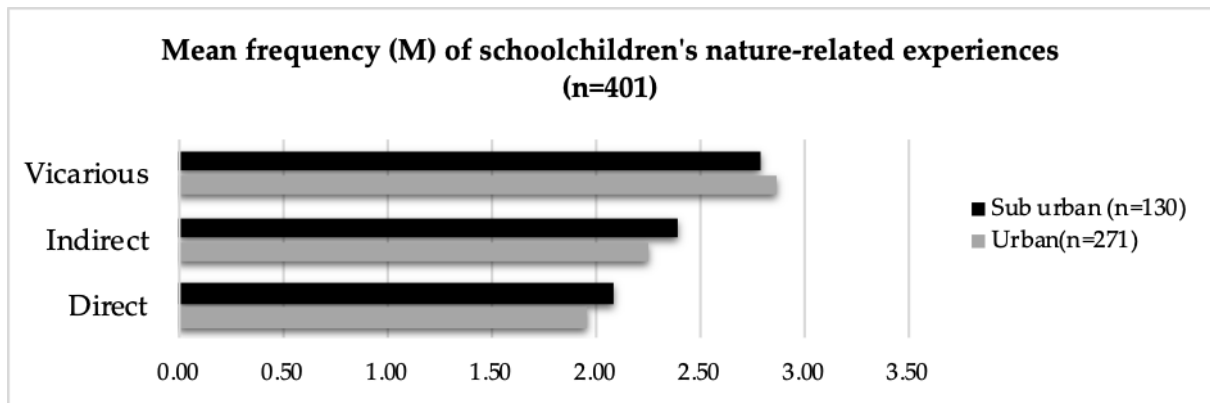


Figure 1. Mean scores of nature-related experiences among school children.

Overall, it is apparent that Malaysian school children (urban and suburban) had quite low mean scores for direct experiences with nature compared to the indirect and vicarious types. Although it is difficult to compare this result directly with other studies due to the small differences in mean scores, it appeared that the vicarious type emerged to be an important trend to experience nature. In this present modern life, it has been well-documented that children have shifted their ways of spending their leisure time. In fact, about 70% of Southeast Asian children play mobile games during their spare time, compared to 56% in the United States. Moreover, the Association of Southeast Asian Nations (ASEAN) countries, such as Indonesia, Singapore, Vietnam, Thailand, and Malaysia, have projected that children have shown changes in play trends, especially those in urban areas, whereas attraction to screen-based entertainment and gadgets (e.g., internet and online games) has increased substantially (Takahashi, 2016).

From the regression, gender, ethnicity, school locations, having pets at home, and gadget ownership, appeared to be factors influence the connections with nature-related experiences among Malaysian children. Gender was a significant factor for 10 activities, all of which were experienced more by boys than girls, except making a crown with flowers and playing games using seeds, sticks or other parts of plants. The girls made paper dolls, designed clothes for their dolls, and played cooking games (*masak-masak*) from sticks and parts of plants. Other than that, having pets at home was also an important factor for 13 activities (including indirect) that influenced children to actively participate in nature-related experiences (Table 1). The positive association between pet ownership and the involvement in nature-related experiences might demonstrate that having pets contributes to more global concern and inclination towards nature.

Table 1. The influence of gender (Male), ethnicity (Malay), school locations (urban or suburban), having pets (pet ownership) and gadget ownership on direct and indirect nature-related experiences; results from linear regression analyses (GLMM).

Nature experiences (DIRECT)	Coefficients ( $\beta$ ) for independent variables					
	Constant	Gender (Male)	Ethnicity (Malay)	School location (Urban)	Has a pet	Gadget owner
1. Flower or plants collecting	2.348*** (0.321)	-0.114 (0.083)	-0.0755 (0.174)	<b>-0.194*</b> <b>(0.090)</b>	0.044 (0.088)	-0.431 (0.100)
2. Touched or Observation of animals (wild and domestics)	2.680*** (0.327)	-0.146 (0.085)	0.067 (0.177)	0.036 (0.091)	<b>0.417***</b> <b>(0.089)</b>	-0.087 (0.102)
3. Herbs or weeds collecting	1.815*** (0.402)	0.043 (0.104)	-0.273 (0.218)	<b>-0.322**</b> <b>(0.112)</b>	-0.077 (0.125)	0.173 (0.059)

Table 1. .... (cont)

4. Fishing	2.332*** (0.237)	<b>0.403***</b> <b>(0.091)</b>	-0.206 (0.190)	<b>-0.367***</b> <b>(0.098)</b>	<b>0.397***</b> <b>(0.094)</b>	0.108 (0.109)
5. Playing with handmade kites	1.956*** (0.322)	0.123 (0.084)	-0.311 (0.175)	<b>-0.296**</b> <b>(0.090)</b>	0.053 (0.088)	-0.033 (0.100)
6. Sliding on the river bank or slope	1.411*** (0.188)	0.060 (0.511)	0.150 (0.140)	-0.059 (0.097)	0.101 (0.063)	0.062 (0.110)
7. Making and playing spinning top	1.263*** (0.304)	<b>0.498***</b> <b>(0.086)</b>	0.114 (0.133)	-0.156 (0.092)	0.126 (0.091)	0.087 (0.104)
8. Playing games using seeds/sticks/or other parts of plants	2.361*** (0.201)	<b>-0.278**</b> <b>(0.097)</b>	0.229 (0.150)	0.004 (0.104)	0.062 (0.102)	-0.048 (0.117)
9. Playing with silts	1.514 *** (0.179)	<b>0.259**</b> <b>(0.087)</b>	0.014 (0.133)	0.035 (0.092)	<b>0.211*</b> <b>(0.090)</b>	-0.185 (0.104)
10. Making a bamboo gun	1.066*** (0.137)	<b>0.248***</b> <b>(0.066)</b>	-0.007 (0.102)	-0.070 (0.071)	<b>0.237***</b> <b>(0.070)</b>	0.021 (0.080)
11. Making a crown with flowers	2.333*** (0.295)	<b>-0.581***</b> <b>(0.084)</b>	-0.304* (0.129)	<b>-0.187*</b> <b>(-0.186)</b>	<b>-0.316***</b> <b>(0.088)</b>	0.018 (0.101)
12. Insects catching	1.684*** (0.218)	<b>0.297**</b> <b>(0.106)</b>	0.440** (0.163)	0.055 (0.113)	<b>0.310**</b> <b>(0.111)</b>	-0.145 (0.128)
13. Bamboo boat	1.316*** (0.131)	0.104 (0.063)	-0.044 (0.098)	-0.078 (0.068)	0.038 (0.066)	-0.029 (0.076)
14. Tree climbing	2.044*** (0.204)	<b>0.368***</b> <b>(0.099)</b>	-0.082 (0.121)	<b>-0.223*</b> <b>(0.105)</b>	0.165 (0.103)	0.006 (0.119)
15. Eating fruits which self-collected	2.418*** (0.203)	-0.032 (0.098)	0.127 (0.152)	-0.002 (0.105)	0.181 (0.103)	0.007 (0.118)
16. Swim in river or waterfall	2.183*** (0.179)	0.048 (0.087)	0.015 (0.133)	-0.018 (0.092)	<b>0.302***</b> <b>(0.091)</b>	0.205* (0.104)
17. Frog catching	1.180 *** (0.147)	<b>0.305***</b> <b>(0.071)</b>	0.052 (0.109)	-0.108 (0.076)	0.122 (0.074)	-0.049 (0.086)
18. Spiders catching	1.349*** (0.190)	<b>0.491***</b> <b>(0.092)</b>	0.048 (0.142)	-0.094 (0.099)	0.061 (0.096)	-0.017 (0.112)
Indirect nature-related experiences (visitation)	Constant	Gender (Male)	Ethnicity	School location (Urban)	Has a pet	Gadget owner
1. Forest	2.391*** (0.175)	-0.108 (0.084)	0.030 (0.130)	0.015 (0.090)	<b>0.250**</b> <b>(0.089)</b>	0.113 (0.102)
2. Urban Park	2.775*** (0.165)	0.028 (0.079)	0.088 (0.122)	0.079 (0.085)	0.006 (0.083)	0.022 (0.096)
3. Zoo or Aquarium/Safari	1.994*** (0.147)	0.016 (0.071)	0.160 (0.109)	0.053 (0.075)	-0.049 (0.075)	0.222* (0.085)
4. Beach	2.186*** (0.144)	-0.099 (0.070)	0.162 (0.107)	-0.024 (0.074)	<b>0.178*</b> <b>(0.073)</b>	0.054 (0.084)
5. Fruit Orchard	2.284*** (0.181)	0.033 (0.087)	0.040 (0.135)	<b>-0.276 **</b> <b>(0.093)</b>	<b>0.336***</b> <b>(0.092)</b>	-0.108 (0.106)
6. Agricultural Land	2.056*** (0.189)	0.151 (0.091)	0.312 (0.141)	<b>-0.426***</b> <b>(0.097)</b>	<b>0.242**</b> <b>(0.096)</b>	0.053 (0.110)
7. Butterfly or Bird Park	1.963*** (0.167)	-0.065 (0.081)	-0.067 (0.124)	-0.052 (0.086)	<b>0.183*</b> <b>(0.084)</b>	0.204* (0.097)
8. Conservation Centre (e.g.; elephant, firefly, turtle, Orang Utan, deer park)	1.397*** (0.136)	0.013 (0.066)	0.207* (0.101)	<b>-0.346***</b> <b>(0.070)</b>	<b>0.171 ***</b> <b>(0.069)</b>	0.015 (0.079)

In parentheses (Standard error, S.E); Significance codes: '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05

## CONCLUSION

In this study, we investigated differences among school geographical areas in nature-related experiences in Malaysia, a multi-ethnic country. Malaysian children did experience direct, indirect and vicarious activities for nature. However, the vicarious type emerged to be an important trend to experience nature. This study provides baseline information on how an urban and suburban population experience different types of nature, especially on the vicarious type and identified that having pets at home affects their connections to direct and indirect nature-related experiences.

Therefore, having pets at home as a significant factor affecting the interactions with nature among school children. This important element is considered to be a novelty for the tropical countries such as Malaysia, in previously the factor used very limited to determine the attitudes towards urban wildlife (Prokop and Tuncliffe, 2010; Bjerke *et al.*, 2003; Driscoll, 1995). The loss of natural areas and increase in population density may accelerate the decline in nature-related experiences in urban areas. Therefore, efforts to create more conservation centre for reconnecting urban children to nature including wildlife will become increasingly important for urban planning and environmental education in tropical developing countries such as Malaysia.

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