The differences of nature experiences between urban and rural children

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Abstract

This study aims to investigate the differences between urban and rural children in experiencing nature through direct experiences and indirect experiences, as well as non-nature experiences. Questionnaires were distributed to 760 children from 20 schools located in urban and rural areas in Kedah and Penang, Malaysia. The data were analysed using mean score, standard deviation and one-way analysis of variance. The results confirmed that direct experiences with nature among children in both urban and rural areas have declined and children obtain nature experiences mostly through indirect experiences. The results also showed that there were differences between urban and rural children in experiencing nature. Rural children have slightly more direct experiences with nature as compared to children in urban areas, but further analysis showed that the differences of direct experiences between children in Urban Kedah and Rural Kedah were the one that significantly differ with each other. As for indirect experiences, urban children have more indirect experiences with nature as compared to rural children. Meanwhile, for non-nature experiences, there was no difference between urban and rural children. Overall, this study suggests that urban and rural location do influence the frequency of children's experiences with nature particularly the frequency of direct experiences with nature. However, having nearby nature within children's places and spaces is rather more important in making a significant difference on how frequent children have direct experiences with nature. This study further highlights the importance to reconnect both urban and rural children with nature within their daily places and spaces such as home yard, neighbourhood areas, playground, and schools. The directions of future research are also discussed.

Keywords: children, direct experiences, experiences with nature, indirect experiences, urban, rural

Introduction

A large number of studies have demonstrated that direct experiences with nature make a significant contribution to children's relationship with nature and their developmental needs. Direct experiences with nature through play and spontaneous activities with nature have been found to have a positive impact on children's connectedness to and attitude towards nature (Thompson et al., 2007; Cheng & Monroe, 2010; Ali et al., 2014; Mahat & Idrus, 2016). Studies have also demonstrated that children's direct experiences with nature contribute to

their understanding on the importance of nature and the importance of taking care the nature, as well as increasing their intention to protect the nature (Jansson et al., 2014; Zhang et al., 2014). Most importantly, the effects endure until they become adult. Retrospective studies have shown that frequent direct experiences with and in nature during childhood have positive effects on children's environmental career choices and environmental concerns (Palmer et al., 1999; Wells & Lekies, 2006; Chawla, 2007), as well as their attitude towards activities with nature (Lohr & Pearson-mims, 2005) when they become adults. Children's direct experiences with nature also have been found to positively affects their developmental needs cognitively, physically, socially, and emotionally (Mustapa et al., 2015). Studies have shown that frequent direct experiences with nature reduce children's dropout (Ruiz-Gallardo et al., 2013) increase children's motor development (Fjørtoft & Sageie, 2000; Said, 2012) and enhances children's social skills (Laaksoharju et al., 2012; Hussein, 2012).

However, it has become a concern as rapid urbanization, population growth, and modernization have reduced children's direct experiences with nature (Louv, 2008; Chawla & Derr, 2012; Myers, 2012). Nowadays, children obtain nature experiences mostly through indirect ways, specifically through media, books or in a classroom. Children also obtain indirect experiences with nature in organized natural areas such as zoo and nature parks. As the consequences of having nature experiences mostly through indirect ways, children have a lack of knowledge about nature, have misconceptions towards nature, and conveyed negative feelings towards nature (Aaron & Witt, 2011; McAllister et al., 2012). This phenomenon might be worse for urban children who have limited access to nature as compared to rural children who can easily access to nature. A study by Shamsuddin & Said (2008) shown that rural children have more opportunities to be explorative in doing activities with nature, and for that reason, they have more direct experiences as compared to urban children. Other studies with children also found that children in rural areas have more direct experiences with nature which further influence their connectedness to nature (Muller et al., 2009; Zhang et al., 2014) and their conservation attitude (Zhang et al., 2014). For example, Zhang et al. (2014) found that rural children who have more direct experiences with nature such as catching butterflies, planting trees, and observing insects; therefore they have more preferences towards nature and have positive attitude towards animal's conservation. Similarly, studies with adult also found that those living in rural areas have more direct experiences with nature; thus they are more connected to nature (Yu, 1995; Hinds & Sparks, 2008; Zheng, Zhang, & Chen, 2011; Howley et al., 2012).

Even though many studies have been conducted to compare nature experiences between urban and rural people, most studies were conducted with adult and only few studies were conducted with children. Moreover, those studies focused only on direct experiences with nature. Little is known on the trends of both direct and indirect experiences with nature among urban and rural children. As the urbanization and modernization have affected both urban and rural children; hence, it is worth to further investigate the trend and differences of nature experiences that include both direct and indirect nature experiences between urban and rural children. Furthermore, previous studies mostly were conducted in Western countries, and few studies have been conducted in Asian countries especially in Malaysia. It is important to fill this gap as studies found that people with different culture have different engagement with nature (Robertson et al., 2003; Milfont, 2012). Therefore, this study aims to identify the differences of nature experiences which include direct experiences and indirect experiences, as well as non-nature experiences between urban and rural children in Malaysia. This study also includes non-nature experiences, the activities that are not related to nature because it can indicate whether the children still play in the outdoor environment.

Methods and study area

Participant

This study employed a quantitative approach involving distribution of questionnaires to 760 children aged 10-11 years old from 20 schools that include both urban and rural schools located in the Northern Region of Malaysia particularly in Kedah and Penang. Only 10- and 11-year-old children were selected as the respondents for this study for the following reasons. First, children aged 7 to 9 years old were excluded as a study has found that children aged 6 to 9 years old have difficulty in understanding the concept and the items in the quantitative instrument (Larson et al., 2009). Second, studies have suggested that the most critical age for children to develop a connection with nature is during middle childhood especially before the children reach 11 years old; thus children aged 12 years old were also excluded (Wells & Lekies, 2006; Ernst & Theimer, 2011; Liefländer et al., 2013). Hence, only 10- and 11-year-old children were selected as the respondents. The samples were chosen using stratified random sampling. Children aged 10 to 11 years old were first divided into location strata (urban and rural schools). Then, five schools were selected randomly from each stratum; all the selected schools were national schools (*Sekolah Kebangsaan (SK)).* Subsequently, a class was randomly chosen from each batch (year) in every school. Complete collection (criterion sampling) was used, which means every student in the chosen classes completed the questionnaire. Overall, 1113 questionnaires were collected; however, only 760 questionnaires were randomly selected according to the number that had been calculated for each stratum, that is, 382 from Kedah and 378 from Pulau Pinang.

Site of study

This study was conducted in the Northern Region of Malaysia specifically in Kedah and Penang. Kedah is located in the northern of Peninsular Malaysia covering an area of 9, 447 km2 (Department of Statistics Malaysia, 2016a). Meanwhile, Penang is located in the north western of Peninsular Malaysia and has smaller size of land with an area of 1, 032 km2. Penang is divided into two parts: main land and island (Department of Statistics Malaysia, 2016b). Kedah and Penang were chosen as the site of the study to present various range of urban and rural areas as both states have different urbanization level. Kedah has the second lowest urbanization level, and Penang has the highest urbanization level for Northern Region. Both Kedah and Penang are surrounded by various types of nature ranging from green grass field, line of trees and groups of plants on the streets and in the neighbourhoods, urban park, forests, beaches, sea sides, and hills. Even though types of nature available in both states are similar, the characters of nature in urban and rural areas in both states (Urban Kedah, Urban Penang, Rural Kedah and Rural Penang) vary as both states have different sizes and different levels of urbanization. Thus, the researchers were able to investigate the differences of nature experiences between urban and rural children for both states.

Research protocol and ethical strategies

Data collection was conducted in February 2016 until April 2016. Approvals were obtained from the Educational Planning and Research Division, MOE, Kedah and Penang Education Department and respective schools prior to data collection. Before beginning distributing the questionnaires, the participants' assent was obtained verbally from the children stating that they are volunteering to participate in the study. The researcher also developed trust with the children to build good relationship with them. The researcher first introduced herself,

explained about the research, and informed the children of what they needed to do. Then, the researcher asked the children about nature and explained nature in the context of the study. Copies of the questionnaire were distributed personally to the children. The researcher read the questions and statements one by one and explained each of them so that children had a better understanding of each statement. At the end of the session, a set of stationery was given to each child as a token of appreciation.

Questionnaire development

Children's experiences with nature were measured through three types of experiences which are 'direct experiences', 'indirect experiences' and 'non-nature experiences'. The items for each type of experiences were developed based on previous instruments, researcher's observation, and also pre-test. The items for experience refer to the activities that were categorized into each type of experience. The children were asked to tick on the frequency of them doing the listed items. Following Cheng and Monroe (2010), this study employed five-point Likert scale (1=never, 2=seldom, 3=sometimes, 4= often and 5=very often). 'Seldom' refers to 1 to 2 times per year, 'sometimes' refers to almost every month, 'often' refers to almost every week and 'very often' refers to almost every day. The questionnaires were distributed in the Malay language as English is not the first language of the children. The children took 20 minutes to answer the questionnaire.

'Direct experiences' was measured by 22 items that have been categorized into activities with plants, activities with earth elements, water activities, and activities with animals. Activities with plants consists of eight items, for example, climbing trees, picking flowers, gardening, and planting. Activities with earth elements includes three items which are playing with soil, playing with mud, and collecting sea shell. Water activities consists two items: bathing at the beach and bathing in the river. Menwhile, activities with animals consists of nine items, for example, fishing, catching butterfly, catching dragonfly, catching bird, and catching insects. The items were adapted from Cheng and Monroe (2010) and W. Zhang et al. (2014). Some of the items were also derived from pre-test.

'Indirect experiences' was measured by 12 items that have been categorized into three categories: observation of natural elements, visit organized natural places, and vicarious activities. Observation of natural elements consists of six items, such as observing plants, observing birds, observing insects, and observing fish. Visits to organized natural places consists of three items: visiting zoo, visiting aquaria centre, and visiting botanical garden. Vicarious activities consists of three items: watching nature programme on television, reading books about nature, and collecting nature pictures. The items for indirect experiences were adapted from Cheng and Monroe (2010). Some of the items were also derived from pre-test.

'Non-nature experiences' includes nine items which refer to the activities that the children always do as their hobbies that were not related to nature. Examples of the items were playing football, playing badminton, cycling, playing at the playground and playing video games. Some of the activities were listed by the children as their hobbies in pre-test, while some other items were derived from literature review. A pilot study was conducted to ensure the children understand the questionnaire. Also, the reliability test was conducted and found that Cronbach's alpha coefficient values for all variables (direct experiences, indirect experiences and non-nature experiences) were acceptable with values ranging from 0.7 to 0.8.

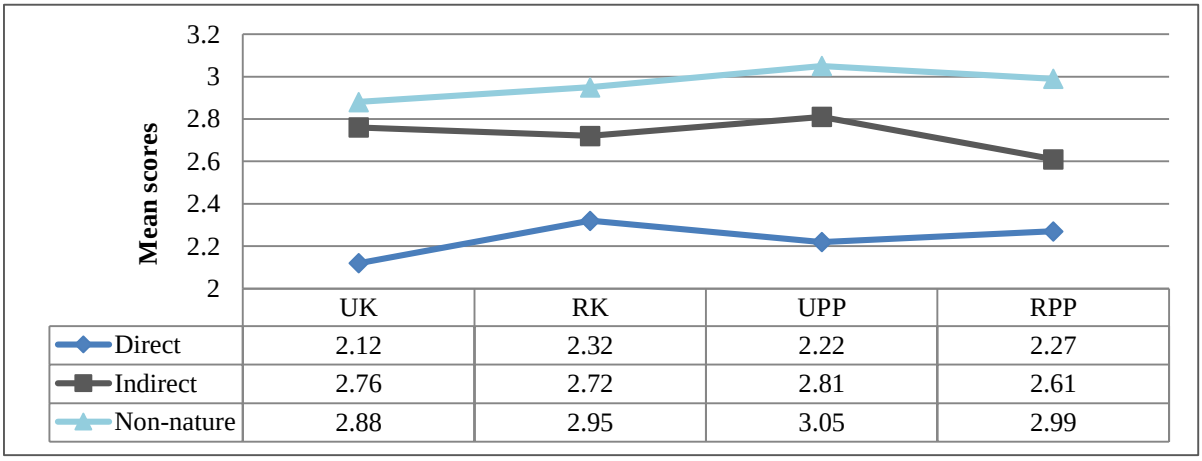
Analyses

The data were analysed using IBM SPSS Statistics Version 22. Descriptive analysis using mean score, standard deviation, and percentage were used to identify the frequency of children's experiences with nature. Meanwhile, inferential analysis using one-way analysis of variance (one-way ANOVA) was used to identify the differences of experiences with nature (direct experiences, indirect experiences and non-nature experiences) between urban and rural children for both states.

Results

Frequency of children's experiences with nature

The highest mean scores indicate that children frequently involved in that particular types of experiences and activities.



	UK	RK	UPP	RPP
Direct	2.12	2.32	2.22	2.27
Indirect	2.76	2.72	2.81	2.61
Non-nature	2.88	2.95	3.05	2.99

Legend: UK= Urban Kedah, RK= Rural Kedah, UPP, Urban Penang, RPP= Rural Penang

Figure 1. Mean scores for direct, indirect experiences with nature and non-nature experiences

Based on Figure 1, it is apparent that for all four locations, non-nature experiences have the highest mean score, followed by indirect experiences with nature and direct experiences with nature. For direct experiences with nature, the mean score is quite low for all four locations with Rural Kedah has the highest mean score (M= 2.32, SD=0.52), followed with Rural Penang (M= 2.27, SD=0.49), Urban Penang (M=2.22; SD=0.54) and Urban Kedah (M=2.12; SD= 0.58). For indirect experiences with nature, Urban Penang has the highest mean score (M=2.81; SD=0.78), followed with Urban Kedah (M=2.76; SD=0.72), Rural Kedah (M=2.72; SD=0.70) and Rural Penang (M=2.61; SD=0.69). For non-nature experiences, Urban Penang have the highest mean score (M= 3.05; SD=0.83), followed with Rural Penang (M= 2.99; SD=0.69), Rural Kedah (M= 2.95; SD=0.72) and Urban Kedah (M=2.88; SD=0.72).

In addition, it can be seen from Figure 1 that there is a clear trend for both direct and indirect experiences with nature in urban and rural in Kedah and Penang. For direct experiences with nature, rural children have slightly higher mean score than urban children for both states. As for indirect experiences with nature, urban children have slightly higher mean score than rural children for both states. Meanwhile, for non-nature experiences with

nature, the mean scores for non-nature experiences for children in Penang is slightly higher than mean score for children in Kedah. Further analyses for direct and indirect experiences with nature as well as non-nature experiences are provided in the following sections.

a. Direct experiences with nature

As shown in Table 1, a similar trend can be seen for watering plants, as more than half of the children from all four locations frequently did this activity, with 51.5%, 53.3%, 63.8%, and 53.0% respectively for Urban Kedah, Rural Kedah, Urban Penang, and Rural Penang. Interestingly, it is apparent that more than half of the children from urban areas in Kedah (52.2%) and Penang (57.5%) had never climbed trees, compared to children from rural areas in both states most of whom had experience of climbing trees. More than half (52.0%) of children from Rural Kedah and about half (49.4%) of children from Rural Penang had occasionally climbed trees. As for other activities in plants, such as picking flowers, making tools from natural elements, gardening, planting trees, picking fruits, and picking vegetables, most of the children in all four locations occasionally did these activities. These results indicate that the children were frequently involved in activities with natural elements that were available within their living environment. These results also indicate that the rural children were more explorative and adventurous than were the urban children because rural areas provide more opportunities for the children to access nature and do this kind of activities.

Regarding activities with earth elements, more than half of the children occasionally played with soil, whereas, more than half of them had never played with mud, and about half of them occasionally collected sea shells. As for water activities, the results show that most of the children occasionally did activities with water. This is related to their living environment, as no children lived near a beach and few children lived near a river. They normally went the beach or the river with their parents or guardian.

As for activities with animals, majority of the children from all locations frequently played with their pets with 67.6%, 61.0%, 58.3%, and 59.3% for Urban Kedah, Rural Kedah, Urban Penang, and Rural Penang respectively. There is also a clear difference between the urban and the rural children in Table 1. Most of the children in urban areas for both states had never had direct experiences with all of the activities with animals (8 activities) except for playing with their pets. In contrast, more than half of the rural children in both states had never been involved with four of the activities, which are catching butterflies, catching tadpoles, catching prawns, and catching birds. More than half of the rural children in both states occasionally had been fishing (57.7% and 52.2% respectively for Rural Kedah and Rural Penang respectively) and catching dragonflies (60.2% and 54.2% for Rural Kedah and Rural Penang respectively). Meanwhile, more than half of the urban children had never been fishing (51.5% and 56.7% for Urban Kedah and Urban Penang respectively) and catching dragonflies (48.%% and 63.0%). In addition, about half of the rural children occasionally caught fish (43.5% and 41.8% respectively for Rural Kedah and Rural Penang). These findings indicate that the children frequently did activities with animals that were available within their living environment. In addition, the children in rural areas had more exposure and direct experiences with animals than had the urban children, as rural areas offer easy access to such experiences.

Table 1. Percentage of Frequencies for Direct Experiences with Nature

Activities	Percentage (%)											
	UK (n=136)			RK (n=246)			UPP (n=127)			RPP (n=251)		
	NV	OC	FR	NV	OC	FR	NV	OC	FR	NV	OC	FR
Activities with plants												
Climbing trees	**52.2**	36.8	11.1	36.2	**52.0**	11.8	**57.5**	35.5	7.1	39.8	**49.4**	10.8
Picking flowers	24.3	47.1	28.7	21.5	52.4	33.8	26.8	42.5	30.7	21.9	50.6	27.5
Tools from nature	29.4	47.0	23.6	29.7	45.9	24.3	22.8	48.8	28.4	29.5	51.0	19.6
Gardening	33.1	44.2	22.8	25.6	52.0	22.4	30.7	42.5	26.8	25.5	47.8	26.6
Planting trees	22.1	58.1	19.8	17.9	53.2	28.9	25.2	44.1	30.7	23.5	51.0	25.5
Picking fruits	11.8	63.2	25.0	12.2	54.5	33.3	22.0	46.4	31.4	11.6	60.3	28.2
Picking vegetables	40.4	42.6	16.9	30.1	48.8	21.1	42.5	37.0	20.5	34.3	44.2	21.5
Watering plants	7.4	41.2	**51.5**	8.9	37.8	**53.3**	5.5	30.7	**63.8**	7.2	39.8	**53.0**
Earth element												
Playing with soil	25.0	64.0	11.0	26.0	63.0	10.9	14.2	74.0	11.8	15.5	71.3	13.2
Playing with mud	75.0	22.8	2.2	63.0	31.7	5.3	75.6	22.1	2.4	71.3	27.1	1.6
Collecting sea shell	50.0	44.9	5.1	41.1	51.2	7.7	37.0	44.9	18.1	39.4	52.6	8.0
Water activities												
Bathing at beach	5.1	86.7	8.1	11.8	82.5	5.7	7.9	84.2	7.8	6.4	86.5	7.2
Bathing in the river	38.2	53.6	8.1	39.4	47.2	13.4	33.9	58.3	7.8	37.8	55.4	6.8
Activities with animals												
Fishing	51.5	38.2	10.3	22.8	57.7	19.5	56.7	28.3	14.9	34.3	52.2	13.6
Catching butterflies	77.9	16.2	5.8	71.1	25.6	3.2	66.1	26.0	7.9	67.3	29.1	3.6
Catching dragonflies	48.5	39.7	11.7	26.4	60.2	13.4	63.0	26.0	11	35.9	54.2	10.0
Catching insects	48.5	35.3	16.2	49.6	37.8	12.6	44.1	34.6	21.2	35.5	45.4	19.2
Catching fish	55.1	35.3	10.3	30.1	43.5	26.4	54.3	30	15.7	39.8	41.8	18.4
Catching tadpoles	73.5	34.6	3.7	61.8	31.7	6.5	66.1	26.8	7.0	55.4	40.7	4.0
Catching prawn	77.9	22.8	5.1	54.5	33.3	12.2	78.7	14.9	6.2	64.5	26.7	8.8
Playing with pet	15.4	16.9	67.6	15.4	23.5	61	21.3	20.5	58.3	19.5	21.2	59.3
Catching bird	75.7	16.9	7.4	59.8	32.5	7.8	68.5	25.2	6.3	67.7	25.5	6.8

Legend: UK= Urban Kedah, RK= Rural Kedah, UPP, Urban Penang, RPP= Rural Penang, NV= never, OC= occasionally, FR= frequent

b. Indirect experiences with nature

Table 2 indicates that most of the children had either occasionally or frequently observed the natural elements. These finding show that the children frequently observed natural elements that are available in their surroundings. The most common activities that half of the children in all four locations did frequently are observing animals, followed by observing birds and observing plants. Regarding visits to organized natural places, more than 70% of the children in all four locations had visited the zoo occasionally. A similar trend can be seen between urban areas for visiting aquaria centres in both states. Just under two thirds (63.3%) of children from Urban Kedah and more than two thirds (71.6%) of children from Urban Penang occasionally visited an aquaria centre. The urban children had more opportunities than had the rural children to visit aquaria centres because aquaria centres are located in big cities.

Table 2. Percentage of Frequencies for Indirect Experiences with Nature

Activities	Percentage (%)											
	UK (n=136)			RK (n=246)			UPP (n=127)			RPP (n=251)		
	NV	OC	FR	NV	OC	FR	NV	OC	FR	NV	OC	FR
Observing natural elements												
Observing plants	19.1	36.1	44.9	16.7	35.7	47.5	19.7	34.7	45.7	23.1	33.8	43
Observing animals	7.4	32.3	60.3	8.9	28.9	62.2	10.2	26.8	63	8.8	39.4	51.8
Observing birds	17.6	33	49.3	13	30.9	56.1	15	30.7	54.4	13.9	40.2	45.8
Observing insects	31.6	27.9	40.5	22.4	42.3	35.4	30.7	24.4	44.8	27.5	40.2	32.2
Observing fish	14.0	45.6	40.4	13	45.9	41	17.3	41.7	40.9	17.9	42.2	40.9
Observing tadpoles	52.2	35.3	12.5	43.1	45.1	11.8	47.2	37.8	14.9	48.6	42.2	9.2
Visits to organized natural places												
Visiting zoo	8.8	82.4	8.8	20.7	72.0	7.3	8.7	82.6	8.6	11.2	82.1	6.8
Visiting aquaria centre	29.4	63.3	7.3	45.9	49.2	4.9	18.9	71.6	9.4	38.6	57.4	4.0
Visiting botanical garden	31.6	58.1	10.3	29.7	58.1	12.2	33.9	51.9	14.2	25.9	66.9	7.2
Vicarious activities												
Watching nature programmes on television	9.6	41.9	48.5	18.3	37.8	43.9	16.5	30.0	53.5	17.1	38.2	44.6
Reading books about nature	18.4	55.9	25.7	18.3	50.8	30.9	23.6	41.7	34.6	16.7	60.2	23.1
Collecting nature pictures	41.2	41.9	16.9	47.6	40.7	11.8	45.7	32.2	22.0	51.0	36.3	12.8

c. Non-nature experiences

As shown in Table 3, the most common activities that the children in all four locations were frequently involved in for non-nature experiences are playing football, cycling, and playing badminton. About half of the children for all four locations either occasionally or frequently played at the playground.

Table 3. Percentage of frequencies for non-nature experiences

Activities	Percentage %											
	UK (n=136)			RK (n=246)			UPP (n=127)			RPP (n=251)		
	NV	OC	FR	NV	OC	FR	NV	OC	FR	NV	OC	FR
Playing football	17.6	36.8	45.6	20.7	30.9	48.4	21.3	30	48.8	21.1	29.4	49.4
Cycling	7.4	31.6	61	5.3	24.8	69.9	7.1	28.4	64.6	6.4	16.8	76.9
Playing badminton	1.5	44.9	53.7	4.1	45.1	50.8	5.5	33.8	60.6	4.4	41.4	54.2
Playground	2.9	56.6	40.5	12.2	47.6	40.3	5.5	30	54.3	5.2	49	45.8
Takraw	61.0	27.2	11.8	44.7	30.1	25.2	55.1	22	22.9	47.8	27.1	25.1
Handball	36.0	42.7	21.3	39.0	41	19.9	32.2	38.8	29.1	31.1	44.6	24.3
Netball	55.1	27.9	16.9	42.7	41.1	16.3	40.2	35.4	24.4	46.2	41.8	12
Volleyball	44.9	38.2	16.9	37.8	48.8	13.4	53.5	23.6	22.9	49.8	39	11.2
Video Game	11.8	32.3	55.8	7.3	33.4	59.4	9.4	23.6	66.9	5.6	31.8	62.5

Differences of experiences with nature between urban and rural children

a. Direct experiences with nature

As shown in Table 4, there is a statistically significant difference at $p < 0.05$ level for direct experiences with nature for four location groups with $F(3, 760) = 2.80$, $p = 0.04$. Even though

the result is statistically significant, the actual difference between the group is small calculated by eta squared (eta squared=0.01). Based on Figure 1, Rural Kedah has the highest mean score (M=2.32, SD=0.52) while Urban Kedah has the lowest mean score (M=2.12, SD=0.58). Post-hoc comparisons test was conducted to identify which group differ significantly from one another. Post- hoc comparisons using Tukey HSD test as presented in Table 5 shows that the mean score for Urban Kedah is significantly different with Rural Kedah, but not with Urban Penang and Rural Penang.

Table 4. ANOVA results for direct experiences with nature across locations

Location		Sum of Squares	df	Mean Square	F	Sig
Urban versus rural	Between Groups	2.322	3	0.774	2.797	0.039
	Within Groups	209.242	756	0.277		
	Total	211.564	759			

Table 5. Results for post-hoc Tukey's test (Direct experiences with nature and locations)

(I) location1	(J) location1	Mean difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower bound	Upper bound
UK	RK	-.15644*	.05622	.028	-.3012	-.0117
	UPP	-.06136	.06492	.780	-.2285	.1058
	RPP	-.10443	.05602	.244	-.2487	.0398

b. Indirect experiences with nature

Finding from Table 6 indicates that there is a statistically significant difference at $p< 0.05$ level of indirect experiences between the location groups with $F (3, 760) = 2.63$, $p=0.49$. However, the magnitude of differences in mean score between the groups is small (eta squared=0.01). As shown in Figure 1, Urban Penang has the highest mean score (M=2.81, SD=0.78) while Rural Penang has the lowest mean score (M=2.61, SD=0.63). Post-hoc least significant difference (LSD) test as shown in Table 7 revealed that there is a significant difference in mean scores for indirect experiences with nature between Urban Penang and Rural Penang, but not with Urban Kedah and Rural Kedah.

Table 6. ANOVA Results for indirect experiences with nature across locations

Location		Sum of squares	df	Mean square	F	Sig
Urban versus rural	Between groups	3.840	3	1.280	2.628	.049
	Within groups	368.255	756	.487		
	Total	372.095	759			

Table 7. Results for post-hoc LSD test (Indirect experiences with nature and locations)

(I) location1	(J) location1	Mean difference (I-J)	Std. error	Sig.	95% Confidence Interval	
					Lower bound	Upper bound
UP	UK	.04811	.08612	.577	-.1210	.2172
	RK	.08713	.07627	.254	-.0626	.2368
	RPP	.19284*	.07600	.011	-.0436	.3420
RPP	UK	-.14473	.07431	.052	-.2906	.0012
	RK	-.10571	.06262	.092	-.2286	.0172
	UPP	-.19284*	.07600	.011	-.3420	-.0436

c. Non-nature experiences with nature

As shown in Table 8, there is no significant difference for non-nature experiences between locations groups F (3, 760) = 1.24, p=0.29. The mean scores of non-nature experiences for all four locations did not differ significantly from each other even though Urban Penang has higher mean score (M= 3.05, SD= 0.83) and Urban Kedah has the lowest mean score (M= 2.88, SD= 0.72) (see Figure 1).

Table 8. ANOVA Results for Non-nature Experiences across Locations

Location		Sum of squares	df	Mean square	F	Sig
Urban versus rural	Between groups	1.985	3	.662	1.240	.294
	Within groups	403.382	756	.534		
	Total	405.367	759			

Discussion

In general, this study revealed that both urban and rural children still play in the outdoor environment, but they are more involved with non-nature experiences, followed by indirect experiences and direct experiences. This findings indicate that the current trend of nature experience is children have more indirect experiences with nature compared to direct experiences. Children obtain nature experiences mostly through observation, vicarious learning activities and visits to organized natural places than doing hands-on activities with plants, animals, earth elements and water elements. Meanwhile, when the children were in the outdoor environment, they involved more with activities such as cycling, playing football, and playing badminton.

As for direct experiences with nature, this study found that rural children have more direct experiences as compared to urban children for both states. Rural children were found to do more activities with nature such as climbing trees, catching butterflies, and fishing. This indicates that the availability of and accessibility to greater amount of nature at home and surrounding areas in rural areas give opporunities for rural children to be explorative and so more willing to participate in that kind of activity. This again can be explained by the fact that nature is more accessible in rural areas, hence, children in rural areas have more experiences with nature (Hinds & Sparks, 2008; Shamsuddin & Said, 2008). Nevertheless, further analysis using post-hoc tests indicated that mean scores for direct experiences with nature between children in Urban Kedah and Rural Kedah that were significantly differ from each other. Meanwhile, mean scores of direct experiences with nature for children in Urban Penang and Rural Penang were not significantly differ with each other. These findings suggest that in Penang, rural and urban children have the same opportunities to access the nature with rural children have slightly more direct experiences with nature. As Penang has higher level of urbanization and have smaller size of land, the types of nature that available in urban and rural areas are similar. Hence, both urban and rural children in Penang have same opportunities in experiencing nature. In contrast, for children in Kedah, rural children have more opportunities to access nature compared to children from urban areas. As Kedah has lower urbanization level, rural areas are more dominant in Kedah and the differences of nature characters between urban and rural areas are apparent. In Kedah, rural areas have greater amount of nature within children's accessibility that include plants and trees in home yard and neighbourhood areas, nearby bushes, nearby forests, paddy field, nearby orchard, and river. Meanwhile, nature within children's accessibility in urban areas in Kedah is only

available in form of plants and trees at home and neighbourhood area. These findings suggest that it is not the differences between rural and urban areas that influence how children have direct experiences with nature, but rather the most important factor is having nearby nature within places and spaces where the children live, learn, and play in their daily life. Nearby nature within children's places and spaces that include home, neighbourhood areas, playground, and schools are important in providing the opportunities for the children to have direct experiences with nature. Greater amount of nearby nature can increase children's independent mobility, and this allows them to be more explorative and engage with nature.

Regarding indirect experiences, findings showed that urban children in both states have higher level of indirect experiences with nature as compared to rural children. There was also a statistically significant difference of indirect experiences between four locations with a small magnitude of differences. A possible explanation for this findings might be related to urban parents who might be more educated and frequently watched nature programmes. This also can be explained by the fact that the natural places such as zoo or aquaria centre are located in urban areas. Thus, urban children have more chances to visit to these places. Meanwhile, for non-nature experiences, there is no significant difference of non-nature experiences mean scores by locations. As non-nature experiences are more related to sports activities or hobbies such as play football, cycling, and play badminton, thus, the surrounding does not play an important factor to effects this type of activities. However, findings for non-nature experiences is important as it indicates that the children still play in the outdoor environment where the nature exist.

Conclusion

In conclusion, direct experiences among both urban and rural children are declining; hence it is crucial to reconnect both urban and rural children with nature. Even though rural and urban location do influence the frequency of children having direct experiences with nature with rural children have slightly more direct experiences with nature as compared to urban children, but rather what is more important is nearby nature within the places and spaces where the children live, play, and learn. The places and spaces include home yard, neighbourhood areas, playground, and schools. Accessibility to and availability of nature within these places and spaces that make a significant difference on how frequent children have direct experiences with nature and this applies in both urban or rural areas. Therefore, the adults who are the practitioners in various fields including built environment, environmental education, and also parents need to play an important role to reconnect both urban and rural children with nature within these places and spaces. Nature should be repositioned in the home yard, neighbourhood areas, playground, and schools. Reconnect the children with nature will further contribute to government's priority in ensuring Malaysians especially children to enjoy a high quality of life corresponding with Malaysia's aspiration to become a sustainably developed nation. Most importantly, it is important to reconnect both urban and rural children with nature to ensure the development of future generations who care for the environment and for nature. In addition, future research should investigate the effects of both direct and indirect experiences on children's connectedness to nature and attitude towards nature to see whether indirect experiences have similar contribution as direct experiences on children's relationship with nature. Future reseach also need to compare the effects of both experiences on children's developmental needs. It is important to fill the gap as direct experiences among children are declining and children obtain most nature experiences through indirect experiences.

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