

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

# **EVALUATING TRANSPORT AND ENVIRONMENTAL VARIABLES AFFECTING PLAYGROUND USAGE AND THE IMPACT OF CULTURAL DIFFERENCES**

***Gila Albert\****

*Faculty of Technology Management, Holon Institute of Technology, Israel*

***Hala Abo-Kalla***

*Faculty of Industrial Engineering and Management, Economics Area,  
Technion – Israel Institute of Technology, Israel*

***Mira Baron***

*Faculty of Industrial Engineering and Management, Dept. of Economics,  
Technion – Israel Institute of Technology, Israel*

*\* Corresponding author, [gilaa@hit.ac.il](mailto:gilaa@hit.ac.il)*

## **ABSTRACT**

The objective of this paper is to evaluate the transport and environmental variables affecting individual usage of playgrounds, with a focus on cultural differences. The paper is based on a survey, which was carried out in Haifa, the third largest city in Israel. The results indicate significant differences between Jewish and Arab populations regarding frequency of playground visits and the extent of playground satisfaction. Differences were also obtained concerning the impact of transport and environmental variables. All of these parameters were found to be more significant among the Jewish population, as this population seems to be more aware of these

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

variables. An analysis of the transport variables shows that the Jewish population considers factors such as playground accessibility, distance to other activities, trip chaining, and parking availability as significantly more essential, compared to the Arab population. The perceived air pollution variable was found to negatively affect frequency of playground visits (only among the Jewish community), as well as the self-satisfaction variable among both communities. Noise was found to adversely affect both the frequency of visits and self-satisfaction in both populations.

**Keywords:** *Playgrounds, transport and environmental variables, cultural differences*

## **INTRODUCTION**

Urban open spaces are a key element, which affects the quality of any urban environment. These spaces are considered as scarce valuable resources, but are often negatively affected by new infrastructure (Walker, 2004; Han and Sagi, 2005). In Israel, over the past years, urban open spaces have been slowly disappearing. For example, in the center of Israel each residence has an access to only 9.5 sq<sup>2</sup> meters of urban open space, compared to the global standard of 22.5 sq<sup>2</sup> meters (Israeli Ministry of Environmental Protection).

Playgrounds, as a type of open space, are commonly planned for children and are considered as local public areas. These spaces provide a variety of economic, environmental, health, and social benefits to the public (Dunnett et al., 2002; Williams and Green, 2001). In Israel, urban playgrounds are classified in several ways, in accordance with their various features, e.g., size, public transportation accessibility, etc. (Raz et al., 2000).

Playgrounds play an important role in children's development by challenging and engaging physical, social and mental capabilities. Nowadays, mainly due to social and technological trends, children tend to spend less time at playgrounds. Therefore, playgrounds' maintenance, quality, design and planning deserves increased focus and these tasks should be undertaken with more caution, in order to attract both children and their attendants (Miles, 2008; Taylor et al., 2006; Booth et al., 2005;

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

Turner, 2004; van Loon and Tuter, 2001). Different communities tend to differently favor the playgrounds they visit. As a result, identifying the parameters that affect individuals' choice of playgrounds may greatly help in maintaining the value of these spaces. Playground utilization involves human interaction, and various populations may possess different preferences when it comes to the usage of playgrounds.

Traditional variables, such as socio-economic characteristics and playground features, are usually taken into consideration (see Kline and Wichelns, 1998 and the references there). Iamtrakul et al. (2004) found that individual preferences towards the environment also affect playgrounds' utilization. Sallis et al. (1997) reported on a study carried out to examine factors used in parents' decisions about the selection of play spaces for their children. The study was conducted by interviewing the parents (primarily mothers) of 178 Mexican American and 122 Caucasian children. The results showed that factors differ somewhat according to either ethnicity or socio-economic status. The most important factors were safety and availability of toilets, drinking water, lighting, and shade. Mexican American parents rated a few items significantly higher than the Caucasian parents, e.g., lighted at night, organized activities, play supplies, and drinking water. Caucasian parents rated other items significantly higher than the Mexican American parents, e.g., distance from home, cost of admission, and child's friends who go there. In another study, Veitch et al. (2006) explored the perceptions of 78 parents from low, mid and high socio-economic areas in Melbourne, Australia. Using an ecological model interview with parents revealed that safety and social factors emerged as key social themes, while facilities at parks and playgrounds, and urban design factors emerged as important physical environment themes.

This paper is based on a survey and aims to evaluate the transport and environmental variables affecting individual usage of playgrounds, with a focus on cultural differences. To the best of our knowledge, these factors have not been specifically addressed in this manner in prior studies. Our hypothesis is that similar to the common variables which were found to differ among cultures in numerous studies, the impact of transport and environmental variables may also vary among cultures.

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

The paper is organized as follows: The following section describes the study method. Then the results are presented and analyzed. Finally, the results and their generalization are discussed, followed by conclusions.

## **METHODOLOGY**

The study method included two main elements. The first was the selection of the study playgrounds. The second was the questionnaire, which was specially designed for the study in order to identify the impact of transport and environmental factors, as well as the influence of cultural differences on playground usage (e.g., frequency of visits, on-site time), and individuals' satisfaction level about specific playgrounds.

The study was carried out in Haifa, the third largest city in Israel. The majority of the population in Haifa is Jewish; approximately 10% of the population is Arab. Fourteen playgrounds in the city's municipal jurisdiction were selected, based on characteristics, such as the neighborhood's socio-economic classification, the playground's distance from main roads and intersections, and playground features (e.g. size, maintenance). In order to better probe the impact of cultural differences, we did not include mixed neighborhoods in the study. Twelve of the selected playgrounds were chosen in Jewish residential neighborhoods, and two of the selected playgrounds were chosen in Arab residential neighborhoods.

Table 1 presents the division of study playgrounds according to the chosen criteria. The National Bureau of Statistic rates all districts according to their socio-economic characteristics on a scale of 1-1,419, where a lower rating corresponds to a lower socio-economic situation. We include three levels of classification: a rating of 1-499 represents a low socio-economic level; a rating of 500-999 represents a medium socio-economic level; and a rating of 1,000-1,419 represents a high socio-economic level. As is shown in the table, in Jewish districts four selected playgrounds represent each of the socio-economic levels.

The city's local council has classified the city playgrounds into categories according to the condition of playground features, size and maintenance; three of these categories indicate "good condition" (e.g., underwent renovations over the past two years). As is shown in the table in Jewish districts, seven playgrounds were categorized as being in "good condition", while the other seven were classified as

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

being in "bad condition". Access to a playground from a main road or intersection was also taken into consideration; a playground located near a main road or intersection, not surrounded by a fence, and with unsafe access is classified as "not secure". As is shown in the table, seven of the selected playgrounds in Jewish districts were categorized as "secure" in this regard, while the other seven were classified as "not secure". Since we were able to locate only a few playgrounds in exclusive Arabs districts, the two playgrounds were selected according to the stated criteria, as is shown in Table 1.

A questionnaire, based on revealed and stated preferences methods, was designed and distributed to adults (parents or family members) present in these playgrounds, with their children, during the afternoons. The questionnaire included 48 items regarding various factors: playground usage (specifically on-site time and frequency of playground visits), level of satisfaction from the playground, travel patterns to and from the playground, the perceived level of noise and air pollution in the playground, and general preferences regarding playgrounds. Traditional variables were also taken into consideration, such as *socio-economic characteristics* and *playground features*. In addition, ecological statistics regarding the *levels of noise and air pollution* in the selected playgrounds were also compiled and compared to the perceived levels reported by the respondents. Since two out of the selected playground are located in Arabic residential districts, the questionnaire was translated into Arabic using the "back-to-back" translation method.

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

ALBERT, Gila; ABO-KALLA, Halal; BARON, Mira

Playground	Socio-economic level			Distance from main road		Playground's condition	
	low	med	high	not secure	secure	good	bad
Jewish districts							
No. 1	x				x		x
No. 2	x			x		x	
No. 3	x				x	x	
No. 4	x			x			x
No. 5		x		x		x	
No. 6		x		x			x
No. 7		x			x	x	
No. 8		x			x		x
No. 9			x		x	x	
No. 10			x		x		x
No. 11			x	x			x
No. 12			x	x		x	
Arab districts							
No. 13	x				x		x
No. 14		x		x		x	

**Table 1.** Division of study playgrounds according to criteria

## RESULTS

Approximately 20 questionnaires were collected in each playground by interviewing adults (parents or family members) present in these playgrounds with their children. A total of 284 completed questionnaires served as the data base for the analysis.

### Socio-economic Characteristics

The socio-economic variables of the respondents specify significant differences between Jewish and Arab sample populations. Among the Jews, 79% of the respondents were female, whereas only 62% among the Arabs were female. This may indicate that while women usually tend to accompany their children to the

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

playground, the percent of men doing this among the Arab population is relatively high. This may be because Arabic males work less, and therefore have more time for other activities, or it may result from cultural reasons.

Other socio-economic variables that were found to be significantly different were the number of children (under the age of 17) per household (higher for the Arabic respondents), and the income level (higher for the Jewish respondents). These findings are in line with the National Bureau of Statistics data.

## **Environmental Variables**

Ecological statistics regarding the level of noise and air pollution in the selected playgrounds were compiled based on data received from the Haifa District Municipal Association for the Environment (HDMAE). These statistics were compared to perceived data reported by the respondents, as presented in Table 2.

HDMAE has set up and is operating an advanced Air Quality Monitoring Network. Data regarding the ambient air concentrations of the pollutants is collected every 30 minutes from the monitoring stations in various locations; the Air Quality Index (AQI) is calculated accordingly. AQI was developed by the HDMAE in accordance with the method currently used in the USA and Europe. The AQI rating varies between plus 100 to minus 200, where a higher rating reflects better air quality. Only negative values reflect deviations from the norm.

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

Playground	AQI	Respondents asserted that the air in the playground is polluted	Noise (in dB(A))	Respondents asserted that the noise in the playground is an annoying variable
Jewish districts				
No. 1	56	43%	64	0%
No. 2	56	26%	67	16%
No. 3	57	75%	68	41%
No. 4	56	27%	65	7%
No. 5	66	37%	71	26%
No. 6	57	73%	72	50%
No. 7	58	38%	65	5%
No. 8	60	23%	64	5%
No. 9	57	29%	65	5%
No. 10	50	64%	70	18%
No. 11	58	5%	67	0%
No. 12	57	40%	67	0%
Arab districts				
No. 13	66	19%	73	47%
No. 14	66	32%	68	63%

Table 2. Noise and air pollution in selected playgrounds

The data compiled from HDMAE indicated that, on average, the air quality - during the period when the questionnaires were collected in the areas where all the selected playgrounds are located – coincides with acceptable norm levels. However, 42% of the Jewish respondents reported that they thought the air in the playground's area was polluted, compared to only 27% of the Arab respondents. One explanation for this difference may be that the Jewish community is more aware of environmental issues, and therefore perceived the level of air quality as being worse.



*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

Noise regulations in Israel define a maximal acceptable noise level within a specified time period, measured from an open living room window, where the noise source is stationary, thus, vehicles, construction equipment, etc. are not included. For example, an acceptable day time noise level for over one hour but under three hours is up to 60 dB(A). Consequently, this value may serve as an underestimation, as regards acceptable noise levels at playgrounds. The Ministry of Environmental Protection recommends that the level of outside noise should not exceed 70 dB(A).

The data compiled from HDMAE indicated that, on average, the noise levels during the period when the questionnaires were collected in the areas where all the selected playgrounds are located - were within norm values. Based on the questionnaires, noise was found not to be an annoying variable. No correlation was found to exist between the measured values and the percent of respondents who indicated that noise was an annoying variable.

## **Transport Variables**

The influence of transport variables on both sample populations is presented in Table 3. As can be seen, it indicates that there are differences between Jewish and Arab populations, as follows:

- Mode of transport to/from playground - 95% of the Arab sample population stated that their usual mode of travel to and from the playground is on foot, compared to only 86% of the Jewish sample population.
- Trip chaining – more than 90% of the Arab sample population reported that their trip to the playground is a home-based trip, compared to less than 78% of the Jewish sample population. The Jewish population views playground accessibility, closeness to other activities, and parking availability as being significantly more essential, compared to the Arab population.

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

An explanation for these differences is most likely based on cultural differences; i.e., general attitudes towards the role of playgrounds, travel patterns, car availability, and socio-economic characteristics.

Variable	Jews			Arabs		
		Importance			Importance	
Parking availability near playground	High	No Opinion	Low	High	No Opinion	Low
	37%	3%	60%	23%	10%	67%
Nearby activities	46%	5%	49%	11%	9%	80%
Origin of trip to playground		Home	Other		Home	Other
		78%	22%		95%	5%
Destination of trip from playground		85%	15%		90%	10%
Mode of travel to/from playground		Walking	Other		Walking	Other
		87%	13%		95%	5%

Table 3. The impact of transport variables

### **Frequency of Playground Visits**

Figure 1 presents the frequency of playgrounds visits for the two sample populations. As can be seen, approximately one-third of both sample populations visit the playground two to three times per week. However, while a negligible percent of the Jewish sample population visits a playground more than once a day, 28% percent of the Arab sample population does so.

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira

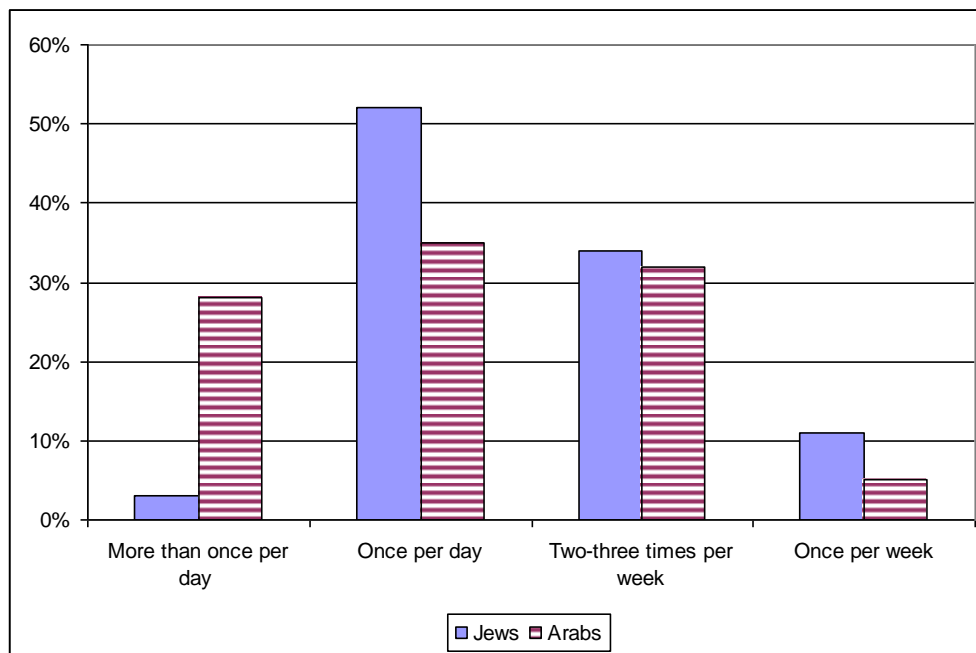


Figure 1. Frequency of playground visits

To gain more insight and a better understanding of the variables affecting this pattern of playground's usage, the Ordered Probit model was used in the analysis and was found to best predict a playground's visit frequency. Table 4 presents the estimation results.

Parameter	Jews		Arabs	
	Estimated value	Sig.	Estimated value	Sig.
Income	-0.20	0.00	0.56	0.00
No. of children	0.21	0.00	0.10	0.00
Trip chaining	0.25	0.01	1.32	0.00
Distance from home	-0.11	0.01	-	-
Access from road	0.18	0.04	-	-
Noise	-0.15	0.04	-0.13	0.00
Air pollution	-0.21	0.00	-	-

Table 4. Ordered Probit estimation results for a playground's visit frequency

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

These results show that some socio-economic variables are significant in the model. The results indicate that the number of children per household has a positive impact on a playground's visit frequency in both sample populations. As the number of children per household increase, there is a general tendency to visit playground more often, most likely since playgrounds are perceived as a cheap alternative to other types of children's activities. This becomes more important as the number of children per household increases in both populations. The impact of income is significant, but has an inverse effect on the populations: among Jews income is negatively related to frequency of playground visits; i.e., as income increases they tend to prefer other, more costly, children's activities (e.g. computers, movies, etc.). Among Arabs, income is positively related to frequency of playground visits. An explanation for this may be found in the differences in income levels, reported previously (higher for the Jewish respondents); a higher income in the Arab population does not necessarily imply that household members can afford other activities for their children and, possibly due to cultural concerns, they do not favor them.

Some of the transport and environmental variables are also significant in the model. Proximity to household location is significant only for the Jewish sample population: distance from the household location to the playground and the frequency of playground visits are negatively correlated. Access from a main road or intersection to a playground is also significant, but only for the Jewish population: the more the access is perceived as "secure", the more the frequency of playground visits increases. Trip chaining also has a positive impact on the frequency of playground visits in both sample populations, most likely since it is perceived as convenient to integrate a playground visit with other activities that can be done with children. Noise is found to be an annoying variable for both populations as having a negative effect on frequency of playground visits. It is important to note that air pollution was found to be significant only for the Jewish population, and has a negative impact on frequency of playground visits. These results are in line with the result reported earlier - that the Jewish population might be more aware of environmental and transport variables.

It should be noted that no differences were found for on-site time distribution. Both sample populations spent an average of one hour in each playground visit.

## Playground Satisfaction

Figure 2 presents playground satisfaction for the two sample populations. As can be seen, differences regarding the extent of satisfaction between the two populations are notable. The Jewish population stated that they are more satisfied with playgrounds, as compared to the Arab population.

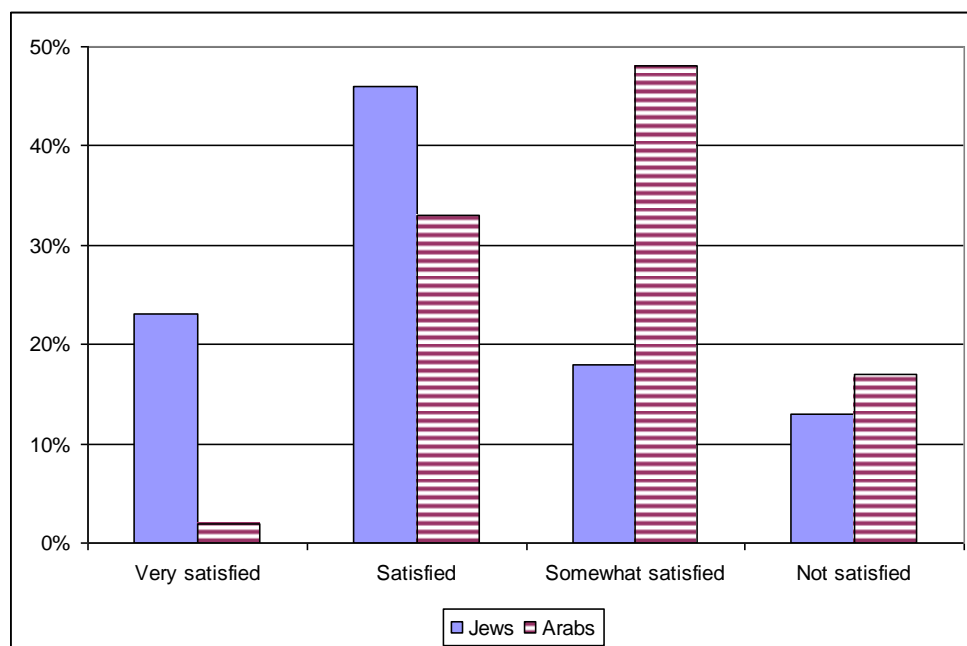


Figure 2. Playground Satisfaction

To gain more insight and a better understanding into the variables affecting the extent of playground satisfaction, the Binary Logit model was used in the analysis and was found to best predict a playground satisfaction. Accordingly, "very satisfied" and "satisfied" were incorporated into one category, while "somewhat satisfied" and "not satisfied" were incorporated into another category. Table 5 presents the estimation results.

The results show that income is significant in the model, but only for the Jewish population. As income increases, the extent of playground satisfaction also increases. One explanation for this finding might be that income is positively

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

Parameter	Jews		Arabs	
	Estimated value	Sig.	Estimated value	Sig.
Income	0.28	0.00	-	-
Playground's condition	1.7	0.00	0.42	0.00
Distance from home	-0.89	0.04	-0.24	0.00
Access from road	0.54	0.00	-	-
Noise	-0.98	0.02	-0.85	0.00
Air pollution	-0.54	0.02	-0.09	0.02

**Table 5.** Binary Logit estimation results for playground satisfaction

correlated with the quality of household surroundings. Therefore, as income increases, the level of satisfaction from the nearest sites increases as well. Playground's condition is significant for both populations and this result seems plausible: the better a playground's condition is perceived, the more the extent of satisfaction will increase.

Some of the transport and environmental variables are also significant in the model. Proximity of the household location to the playground is significant for both populations, and has a positive impact on playground satisfaction: distance from the household location to the playground, and the extent of satisfaction are negatively correlated. Access from a main road or intersection to a playground is also significant, but only for the Jewish population: the more the access is perceived as "secure", the more the extent of playground satisfaction increases. Noise is found to be an annoying variable for both populations, and has a negative effect on playground satisfaction. Air pollution was also found to be significant for both populations, and has a negative impact on playground satisfaction. However, this impact is much more intensive for the Jewish sample population.

## **DISCUSSION AND CONCLUSIONS**

This paper aims to evaluate the transport and environmental variables affecting the usage of playgrounds, with a focus on cultural differences. Whilst some traditional variables, such as socio-economic characteristics and playground features were also taken into consideration and found significant, the transport and environmental variables were also found noteworthy. To the best to our knowledge, these variables have not been previously investigated in prior analyses of playgrounds' usage and utilization. It is worth noting that their impact may vary among different populations and be affected by cultural differences.

The results indicate significant differences between Jewish and Arab populations, as regards frequency of playground visits and the extent of playground satisfaction. Almost two-thirds of the Arab sample population visits a playground at least once a day, compared to 55% of the Jewish sample population. However, the level of self-satisfaction from a playground is significantly higher for the Jewish sample population. These results seem plausible, as previous studies (e.g. Sallis et al.; 1997) confirm that different communities differently favor playgrounds and their characteristics.

A reasonable explanation for these patterns most likely can be found in socio-economic and cultural differences. A typical Arab household in Haifa has more children under the age of 17 and a lower level of income, compared to a typical Jewish household in Haifa. Playgrounds are easily accessed on foot, no entrance fees are levied, making playgrounds as an attractive option for spending time with children, even though the level of satisfaction from the playground is low compared to the Jewish population. The Jewish population may prefer indoor activities for their children, and it seems that they tend to incorporate recreation at playgrounds together with other activities that can be done outside with their children, even though the level of satisfaction from playgrounds is higher compared to the Arab population. The Jewish population views proximity of playground to other activities as significantly more important compared to the Arab population. While Arabs' visits to playgrounds are primarily (95% of the Arab sample population) home-based trips made on foot, these percentages are significantly lower for Jews.

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

*ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira*

Differences are also obtained concerning the impact of transport and environmental variables. All of these parameters were found to be more intensive among the Jewish population, as Jews seem to be more aware of them. Analysis of the transport variables shows that the Jewish population considers playground accessibility, distance to other activities, trip chaining, and parking availability as significantly more essential, compared to the Arab population. Analysis of the environmental variables shows that most of the respondents (especially the Jewish population) believe that the level of air pollution is high. However, the ecological data shows that only in one of the selected playgrounds was the air quality actually worse than the norm. The perceived air pollution factor was found to negatively affect the frequency of playground visits (only among the Jewish community), and as regards the self-satisfaction factor, for both communities. Noise was found to be an annoying variable, but it was not above the norm in many of the selected playgrounds, and adversely affected the frequency of visits and self-satisfaction in both populations.

There is no doubt that playgrounds play an important role in child development. However, not much attention is provided in the literature on the variables that may cause a playground to be considered more attractive. This becomes even more important today since children tend to play less time at playgrounds. In countries like Israel, where the weather usually enables outdoor activities all year round, much more emphasis on the policy side should be given to playgrounds. In addition to characteristics such as playground features that are already known as an important variable and were not evaluated in this study, other variables should be addressed by policy makers. For example, playgrounds accessibility, distance from main road or intersection, nearby activities, the possibility to chain activities, and the importance of these variables to different population should also be taken into consideration.

To generalize the study results, larger samples should be engaged and the analysis should be treated with more caution, due to the bias of stated preferences data. In addition, the study results are drawn based only on respondents currently present in playgrounds; therefore, the study does not reflect the entire population.



*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira

## REFERENCES

Booth, K., Pinkston, M. and Poston, W. (2005). Obesity and the Built Environment *Journal of the American Dietetic Association*, Volume 105, Issue 5, pp. 110-117.

Dunnett, N., Swanwick, C. and Woolley, H. (2002). Improving Urban Parks, Play Areas and Green Spaces. Department of Landscape, University of Sheffield, UK.

Haifa District Municipal Association for the Environment (HDMAE). Available at <http://www.envihaifa.org.il/eng/index.asp>

Han, I., Sagi, Y. (2005). Preserving Open Spaces: Decision Analysis, the State Authority, Annual Report for 2005, *Deshe Institute – The Image of the State of Israel*, pp. 9-14. (In Hebrew).

Iamtrakul, P., Teknomo, K. and Hokao, K. (2005). Public Park Valuation Using Travel Cost Method. *Proceedings of Eastern Asia Society Transportation Studies*, Vol.5, 2005, pp. 1249-1264.

Israeli Ministry of Environmental Protection. Available at <http://www.sviva.gov.il/bin/en.jsp?enPage=HomePage>

Kline, J and Wichelns, D. (1998). Measuring heterogeneous preferences for preserving farmland and open space *Ecological Economics*, Volume 26, Issue 2, pp. 211-224

Miles, R. (2008). Neighborhood Disorder, Perceived Safety, and Readiness to Encourage Use of Local Playgrounds, *American Journal of Preventive Medicine*, 34(4), pp. 275-281.

National Bureau of Statistics. Available at [http://www1.cbs.gov.il/reader/cw\\_usr\\_view\\_Folder?ID=141](http://www1.cbs.gov.il/reader/cw_usr_view_Folder?ID=141)

Raz, E., Ein-Dor, D., Ben-Ari, E. (2002). Urban Open Areas, Measures and Planning Guidelines, *Mankind, Nature and Law*, 2002. (In Hebrew).

*Evaluating transport and environmental variables affecting playground usage and the impact of cultural differences: A case study in Israel*

ALBERT, Gila; ABO-KALLA, Hala; BARON, Mira

Sallis, J., McKenzie, T., Elder, J., Broyles, S. and Nader, P. (1997). Factors Parents Use in Selecting Play Spaces for Young Children. *Pediatrics & adolescent medicine*, 151(4), pp. 414-417.

Taylor, W.C., Poston, W., Jones, L. and Kraft, M. (2006). Environmental Justice: Obesity, Physical Activity, and Healthy Eating. *Journal of Physical Activity and Health*, Vol. 3, Sup I.

Turner, M.A. (2004). Urban Parks as Partners in Youth Development. Beyond Recreation, The Urban Institute, The Wallace foundation, pp.1-8.

Van Loon A. and Tutert, E. (2001). Road Safety for Children: An Accident Analyses for Better Road Conditions for Children in the Netherlands. *Proceedings of the Canadian Multidisciplinary Road*.

Veitch, J., Bagley, S., Ball, K. and Salmon, J. (2006) Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & Place, Volume 12, Issue 4, , pp. 383-393*

Walker C. (2004). Understanding Park Usership, Beyond Recreation, The Urban Institute, The Wallace Foundation, pp.1-12.

Williams, K. and Green, S. (2001) Literature Review of Public Space and Local Environments for the Cross Cutting Review. Department for Transport, Oxford Centre for Sustainable Development, Oxford Brookes University, UK.