

The link between ethnicity, ecological literacy, and childhood experience and what people value in urban nature

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Abstract

Cities around the world are focusing on improving the environment in neighborhoods by investing in urban parks. Parks serve a great need for people, but are often developed with a lack of understanding of the surrounding community and their preferences for nature. We created a survey and distributed it in diverse areas in the County of Los Angeles. This study demonstrates how factors such as ethnic background, knowledge of nature, and childhood environment have a significant influence on a person's preferences for nature. We also found evidence that socioeconomic status affects perceived barriers to accessing nature. In conclusion, urban parks are not "one-size-fits-all" but instead should be designed for the communities they serve.

Keywords: Diversity, Parks, Green Spaces, Culture, Nature, Cities, Urban planning

1. Introduction

The world is increasingly urban. One consequence is a lack of direct experiences of nature for the majority of the world's city-dwellers (Soga and Gaston 2016). Conservation organizations have consequently initiated major urban initiatives to introduce nature into cities (Natural Capital Project 2015, [The Nature Conservancy](#)) with the goal of ensuring that people learn to appreciate nature. But it is not just conservationists who promote urban parks. There is growing evidence that green space and parks can enhance cognitive function, improve mental health and physical health, and promote community cohesion (Hobbs and White 2016, Soga and Gaston 2016). For these reasons urban parks are seen as a public good for a city's population. Forms of urban nature vary widely—from restoring rivers such as the Los Angeles River, to installing bike paths in neighborhoods. Many cities throughout the world, including Los Angeles, are investing heavily in restoring natural areas or providing green space for their populations. The budget for the City of Los Angeles parks and recreation department has increased by 20% over the last five years, amounting to \$212 million for the 2015-2016 year (City of Los Angeles).

Urban parks and green spaces tend to be designed by professional city planners, with occasional input from environmental groups. However, rarely is the public consulted on how they value nature, though they are the users of parks. This is particularly important because previous studies have indicated that different ethnic groups value and use nature in different ways (Marvier and Wong 2012). If these cultural differences are not accounted for, then there is a risk that urban nature will not meet the needs of local communities. A related concern is that urban parks are often designed by powerful and wealthy sectors of the community, in disregard for what less affluent communities would like to see (Kreitner 2016).

We addressed these questions in Los Angeles, which is experiencing a renaissance of urban design, including a massive effort to restore 51 miles of the LA River, and plant trees and build parks throughout the city. Our survey overlaps with surveys used in several previous studies, but also included a few key new features. First we included questions that assessed “ecological literacy” and in doing so can relate that literacy to what type of nature is valued by people. We also provided photos of different forms of nature for respondents to select. Finally, we included questions about particular animal species to get a sense of how the public felt about wildlife, which is a component of many urban conservation projects. Because LA is one of the world's most diverse cities, it affords the opportunity to sample a rich diversity of cultures and ethnic groups. In particular, we chose different neighborhoods in LA to capture a wide range of socioeconomic status and ethnicity. Like several previous studies we surveyed visitors

in several different parks (Scopelliti et al 2016). However, we supplemented this sampling of park users with individuals at a Department of Motor Vehicles office who may or may not use parks. The contrast between these two groups lends insight into the bias introduced into studies that only sample park users.

To assess what form of nature people want in urban parks as well as how they enjoy that nature we designed a short, 33 question survey, that could be completed within 15 minutes. The survey was administered in two ways: 1) to people standing in line at a Department of Motor Vehicles (DMV) office in Lincoln Heights and 2) to people visiting five different urban parks. The DMV sample represents individuals who may or may not visit or use parks, whereas the “park samples” obviously selected individuals who use urban parks. The total sample sizes were 100 individuals for DMV, and 300 individuals spread among four [Office1] different urban parks. We chose a subset of parks to span a range of park types and neighborhoods with different socioeconomic characteristics.

2. Materials and Methods

2.1 Location Determination

Before selecting parks, we selected specific neighborhoods that would represent a range of cultural diversity, socioeconomic status, neighborhood density, and housing type. To look at these differences between neighborhoods in Los Angeles, we utilized maps online provided by the LA Times, Cali Parks.org, and the Cooper Center. In total, we selected five neighborhoods we found most suitable to reflect a range in the qualities listed above: Koreatown, Echo Park, Pasadena, South Pasadena, and Lincoln Heights. The key attributes of these neighborhoods are presented in Table 1. Photos of the parks we sampled are in Appendix 1A. Diversity, measured by the non-White population varied from 92.2% to 48.5% in these neighborhoods.

In Koreatown two parks were sampled due to low visitation to parks: Shatto Recreation Center and Park and MacArthur Park. The Shatto Recreation Center has the most amenities, including tennis courts, an outdoor gym, a blacktop basketball court, and a playground and grassy space for recreation, along with an indoor recreational area. MacArthur Park has a walking path that surrounds a pond as well as a turf field for games and a playground for younger children with a much smaller gym area outdoors than the one at Shatto Recreation Center. Echo Park Lake is a newly developed public park that often draws visitors from outside the immediate neighborhood. The park features a playground for younger children as well as a bike path that circles a large pond in the central portion of the park. The park also has paddleboats available for rent, and several large grassy areas that visitors frequent. In South Pasadena we sampled Garfield Park, which has a bike path, a playground, several open fields, several baseball fields, an outdoor gated pool recreational area, and a childrens’ museum. In

Pasadena, we sampled a park opposite the Rose Bowl, Arroyo Seco, which has large open fields and playground amenities.

2.2 Survey

The survey was utilized as a tool to collect public opinion on personal, cultural, and socioeconomic information; perceptions of access to and safety in parks; uses of parks; and preferences for characteristics and amenities in parks. The survey itself was comprised of 33 questions that address our research questions about the topics listed above. Our survey design included a mixture of multiple choice, scale choice, picture choice for variance, and was designed to be completed in a 10 to 15 minutes. To provide a sufficient sample size to conduct adequate statistics approximately 80 surveys were administered at each of five study locations for a total of 400 surveys. After obtaining 50 surveys from each location the survey was edited so that the photo question of the survey had all of the images for the question on a single page for ease of answering, as it was previously spread across four pages.

The surveys were administered over four weekend trips and four weekday trips. Potential participants were intercepted at random throughout the park regardless of the activities they were engaged in. The purpose of the survey was explained and with verbal consent the survey was then administered and answered anonymously, returned to the surveyor who then marked the location, date, and the person's gender. After the surveys were collected the information was aggregated into a single spreadsheet for each of the study locations.

2.3 Data analysis

We used chi-square tests in SPSS to calculate significance between variables such as ethnicity, education and literacy, economic status, and childhood environment. Some variables were calculated by summing together multiple survey questions (see Table 2). Additionally, many variables were ranked low, medium and high, yielding greater sample sizes in the data.

We incorporated spatial analysis techniques to illustrate our survey results geographically. Using ArcGIS, we imported a comma-separated value file (CSV) of the survey data and linked each participant's zip code with the zip code polygon layer from the Los Angeles County Data Portal. We used the dot density symbol type to display survey participants in each zip code, with dot colors differing by specified ethnicity.

3. Results

3.1 Geographic distribution of Participants

The spatial analysis of our data allows us to interpret results, identify patterns, and distinguish problems based on geography. When comparing the four maps of park survey participants, spatial patterns are visible. Visualizing dot density illustrates clustering groups, ethnicity patterns, and distances traveled for survey participants. Clustering around the park's location is most dense in Koreatown (Figure 1), followed by Echo Park (Figure 2), South Pasadena (Figure 3), and Pasadena (Figure 4) respectively. In Figure 1, the majority of participants surveyed at the two Koreatown park locations resided in relatively local zip codes compared to other survey locations. Similarly, Figure 1 shows Asian and Hispanic ethnicity clustering in the Koreatown parks.

3.2 Cultural factors

The effect of ethnicity on preference of park types was examined through two questions: what type of habitat and what types of wild animals did respondents prefer? The ethnicity groups that we examined were White, Hispanic, Asian, and African-American. For their habitat preference, respondents were asked to choose one photograph from four habitat types: a wild landscape, a lawn with trees and picnic tables, a flowering garden, and a lake (see Q. Photo). The Pearson Chi-Square test for the relationship between ethnicity and habitat preference was significant $P < 0.0001$ (Table 3). The White ethnicity group had an overwhelming preference of 65.10% respondents for wild habitat, while other ethnicities had much more diverse preferences. Among Hispanics, 35.30% of respondents preferred the wild habitat, and 30.30% preferred the picnic habitat. Asians did not have a strong preference for any of the habitat types, ranging from 20.40% to 28.60% of respondents for all the choices (Figure 8). It should be noted that there were only 26 respondents in the African-American ethnicity group.

To understand further the comfort levels of different ethnicity groups with increasingly wild habitats, a question asked what types of wild animals respondents desired to see in nature. The animals were grouped into attractive (songbird, deer), predator (hawk, coyote), human-associated (raccoon, pigeon), and creepy (snake, tarantula) (Table 4). The most popular wild animal group was attractive, with the percentage of people who desired to see wild animals ranging from 83.91% of White respondents to 59.80% of Hispanic respondents (Figure 9). The least popular wild animal group was creepy, with responses ranging from 33.48% of White respondents to 5.77% of African-American respondents wishing to see animals in this group. The attractive and creepy groups show that there are trends in nature preference that can transcend ethnicity.

Other factors that we wanted to compare against ethnicity for strength of relationship were childhood exposure to nature and socioeconomic backgrounds. The childhood

exposure to nature question asked respondents to choose what type of environment they grew up in. The responses were regrouped into three variables: much exposure to nature, some exposure to nature, and no exposure to nature (Table 2). The Pearson Chi-Square test for the relationship between childhood exposure to nature and habitat preference was significant <0.0001 (Table 5). The results showed a strong trend, where the more childhood exposure to nature a respondent had, the more likely they were to favor the wild habitat — 56% of the respondents with much childhood exposure to nature preferred the wild habitat, 45% of respondents with some childhood exposure preferred the wild habitat, while 27% of respondents without childhood exposure to nature preferred the wild habitat. People without childhood exposure to nature did not have a strong preference for any of the habitat types; their percentages for different habitats ranged from 23.08% to 26.92%. However, the respondents without childhood exposure to nature did have a higher than expected preference for the garden habitat. (Figure 10).

We created a series of questions that allowed us to assess ecological literacy and classical love of nature. Ecological literacy and classical love of nature were constructed from a combination of variables, created by ranking and summing multiple survey questions (see Table 2). The Pearson Chi-Square test was significant at less than 0.001. These results are based on 402 respondents. Among respondents with low ecological literacy, 11.5% exhibited a low classical love of nature, 63.5% exhibited a medium love of nature, and 25% a high love of nature. Medium ecological literacy resulted in 5.5% of respondents exhibiting a low classical love of nature, 50% medium love, and 44.5% high love of nature. Lastly, among those who scored high in ecological literacy, 2.6% exhibited low love of nature, 33.6% medium, and 63.8% high love of nature. See figure 6.

3.3 Socio-economic factors

Socioeconomic status, ranking a combination of responses from education and income, showed a similar trend to childhood exposure to nature. (Figure 11). The Pearson Chi-Square test for the relationship between socio-economic status and habitat preference was significant at 0.002 (Table 6). The results showed that 52% of high socio-economic status respondents preferred wild habitat, 42.53% of medium socio-economic status respondents preferred the wild, and 29.82% of low socio-economic status respondents preferred wild habitats (Figure 11). As socio-economic status falls, so does the preference for wild habitat types. Much like respondents without childhood exposure to nature, respondents with low socio-economic status did not have a dominating preference for a particular habitat type, but did have higher than expected preference for the garden habitat.

Respondents were asked to specify an obstacle that prevents them from enjoying nature. The obstacles included not having enough time, nature being too far, feeling unsafe and fearful, parks feeling too crowded, parks being too expensive, parks not fitting their interests, and other obstacles. A cross tabulation between socioeconomic status and perceptions of obstacles to enjoying nature was significant at 0.005 and is represented in a graph (Figure 5). The sample sizes for low, medium, and high socioeconomic status are 71, 175, and 95 respondents (Table 7). An overwhelming number of people at all socioeconomic levels said not having enough time was the main obstacle to interacting with nature with 45.1% of low socioeconomic status, 50.4% of medium socioeconomic status, and 75.8% of high socioeconomic status feeling pressed for time. Distance was the biggest obstacle for 16.9% of low, 16.6% of medium, and 9.5% of high socioeconomic status. The next largest obstacle was over-crowded parks, chosen by 11.3% of low, 17.4% of medium, and 7.4% of high socioeconomic status. A notably larger portion of people from low (9.9%) and medium (13.7%) socioeconomic status answered that parks were unsafe, compared to respondents of high socioeconomic status (4.2%). Only 4.3% of people in low and 2.3% of people in medium socioeconomic levels reported that it is too expensive to interact with nature. Similar percentages, 4.2% of low and 1.7% of medium socioeconomic status, said that they were not in nature. No one in the high socioeconomic status category answered that visiting nature is too expensive or that parks did not fit their interests. Other was an option if the respondent felt the available choices were not representative of barriers they perceive, and 8.5% of low, 4.6% of medium, and 3.2% of high socioeconomic status specified their own perceived obstacles. Across the board, people of low, medium, and high socioeconomic status do not have enough time to enjoy nature regardless of their economic differences. However, people of low and medium socioeconomic status report more obstacles to visiting parks related to distance, poor maintenance, and congestion than people of high status.

4. Discussion and Results

4.1 Ethnicity Influence

As with several previous studies, ethnicity can shape the type of nature people seek. For example, we found that Whites had a prominent preference for rugged, “pristine” habitat and preferred to see all animal types, leading to the conclusion that White respondents prefer a more wild, natural habitat.

In other studies, Hispanic and African-American respondents have shown a preference for group activities with family and friends in parks or nature. A majority of both these two ethnicities in our study preferred the picnic habitat and had the lowest preferences

for both creepy and predator animal groups. This leads to the conclusion that the Hispanic and African-American groups prefer a more human-oriented, socially-friendly habitat. However, the Asian group in our study did not strongly prefer the garden habitat as previous literature suggests.

It should also be noted that the lake habitat type was not as preferred as might be expected. In other settings lakes and water are strong favorites. The absence of a strong preference for the lake habitat might be due to the fact that this survey was conducted in Los Angeles County, where large bodies of water are rare. The preferences of respondents may favor habitat types most characteristic of their locations. Ethnicity should be a major factor in influencing the design of a park, which might mean in the multicultural region of Los Angeles that a park should have many different features to accommodate different preferences. But ethnicity should not be the only factor considered when deciding a park design.

4.2 Childhood exposure and socioeconomic status key

In this study, childhood exposure to nature and socio-economic status seemed to offer a clearer overall trend than ethnicity does for the preference of wild habitat.

Socioeconomic status is often closely tied with childhood exposure to nature. In the Los Angeles region in particular, there could be an overlap among respondents of high socioeconomic status and those who had much childhood exposure to nature because of the expansion of affluent suburbs away from the inner city. This leads to the question of whether the two factors combined could be a more profound influence than ethnicity, which previous literature has focused on. [Office3] When considering the design of a park, these factors should be considered as well, so that the parks can actually meet the needs of the community. Further studies should strive to understand whether different people of different ethnicities who came from the same childhood environment with the same socioeconomic status prefer the same type of habitat, or whether their culture would override their preference, and to what extent.

4.3 Strong correlation between love of nature and ecological literacy

We found a strong relationship between what people know about nature and how much people love nature. Respondents with higher ecological literacy scores reported a higher love of nature score. This brings us to question whether to love is to know, or to know is to love? We can see this further complicates the story. People think differently of nature and prefer different kinds of nature based on their ethnicity, socioeconomic status, and their childhood experiences, yet, simply knowing more about nature can greatly influence how much time you spend in nature, if you desire more nature in your neighborhoods, and whether you support projects such as restoration of the LA River.

4.4 Nature makes people happy

When we asked respondents to choose two sentiments that best describe how they feel in nature, more than 50 percent answered “happy.” This was not restricted to one ethnicity but was seen across the board. Nature makes us happy and we need it. Yet individual differences complicate this simple emotion and must be taken into consideration. Not everyone wants the same park or the same animals in parks. People have different childhood experiences that shape their definition of the natural world. People’s ethnicity, income, and education affect their views of the environment and create varying obstacles that prevent them from enjoying the outdoors. Thus, we know we need nature, it makes us happy, but we must look to support the needs of all individuals and avoid a ‘one park fits all’ model.

4.5 Obstacles

We found that people at lower socioeconomic levels experience more barriers to visiting parks related to greater distance, feeling unsafe, and overcrowding in parks. Overall, people are positively affected by nature, making it important to put effort and funding toward lowering barriers and creating equitable access to parks, especially if barriers can be easily eliminated by cleaning up existing parks and providing more lighting, which was desired by many respondents. Data such as ours on cultural preferences and desires of parks users can be used as a tool for creating quality park environments that communities will fully use and enjoy.

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References

Byrne, Jason. Wolch, Jennifer. “Nature, race, and parks: past research and future directions for geographic research.” *Sage Publications* (2009): Web. Nov. 2009

- Byrne, Jason. Wolch, Jennifer. Zhang, Jin. "Planning for environmental justice in an urban national park." *Journal of Environmental Planning and Management* 52.3 (2009): Web. Nov. 2015
- Floyd, M. F. et al. 1994. Race, class and leisure activity preferences: Marginality and ethnicity revisited. *Journal of Leisure Research* 26: 158-173.
- Gobster, P. H. 2002. Managing urban parks for a racially and ethnically diverse clientele, *Leisure Sciences* 24:143–159
- Kaplan, Stephen. "The restorative benefits of nature: Toward an integrative framework." *Journal of Environmental Psychology* 15 (1995): 169-82.
- Kaplan, R. and J. Talbot. 1988. Ethnicity and preference for natural settings: a review and recent findings. *Landscape and Urban Planning* 15: 107–117
- Loukaitou-Sideris, Anastasia. "Neighborhood Safety and Security Considerations and Their Effects on Walking". *Journal of Planning Literature* 20.3 (2006): Web Nov. 2015
- Mayor's Office of Long-Term Planning and Sustainability. PlaNYC: Progress Report 2008. New York City: Mayor's Office of Long-Term Planning and Sustainability, 2008. Print.
- Özgüner, H. 2011. Cultural Differences in Attitudes towards Urban Parks and Green Spaces, *Landscape Research* 36: 599-620.
- Toledo, V.M. 2001. Biodiversity and indigenous peoples. *Encyclopedia of Biodiversity* 3: 451-463.
- United States Government Printing Office "Hearing before the subcommittee on Water Resources and Environment of the committee on Transportation and Infrastructure House of Representatives One Hundred Eleventh Congress." United States Government Printing Office, 4 Feb. 2009. Web. 7 Dec. 2015.
- Wolch, Jennifer. Wilson, John P. Fedrenbach, Jed. "Parks and Park Funding in Los Angeles: An Equity-Mapping Analysis." *Original Articles* 26.1 (2005): Web. Nov. 2015

Figure Legend

Figure 1.



Figure 2.

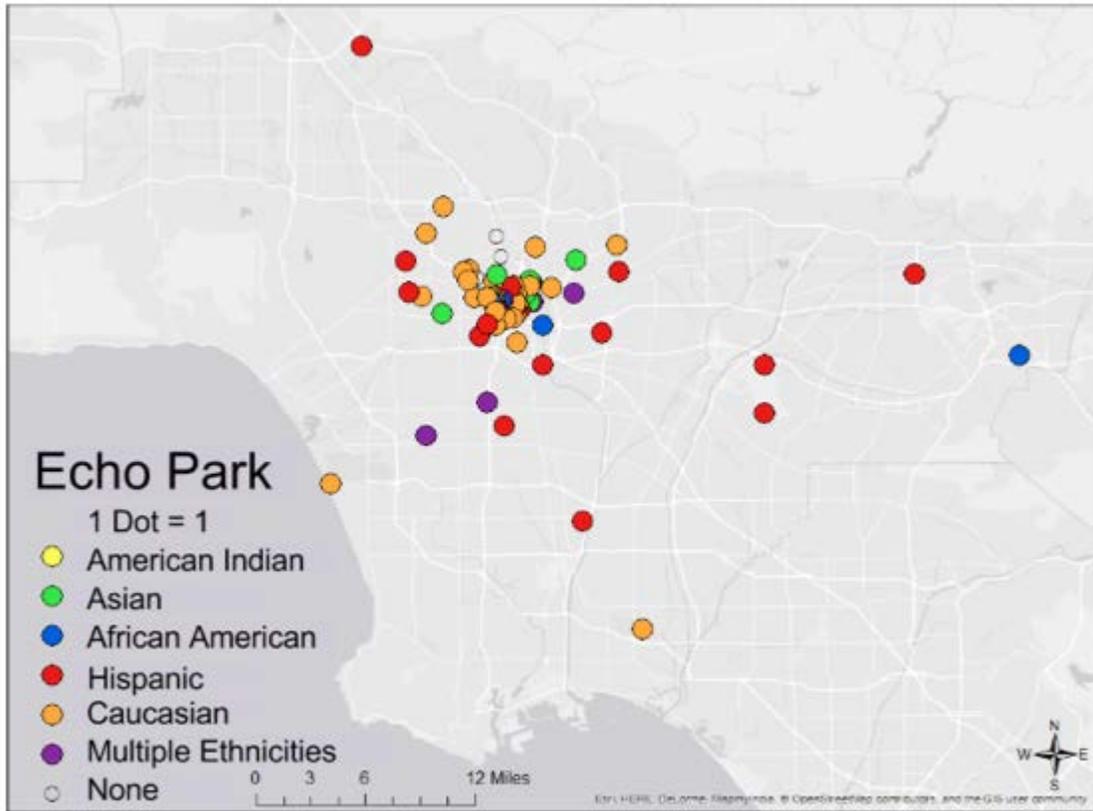


Figure 3.

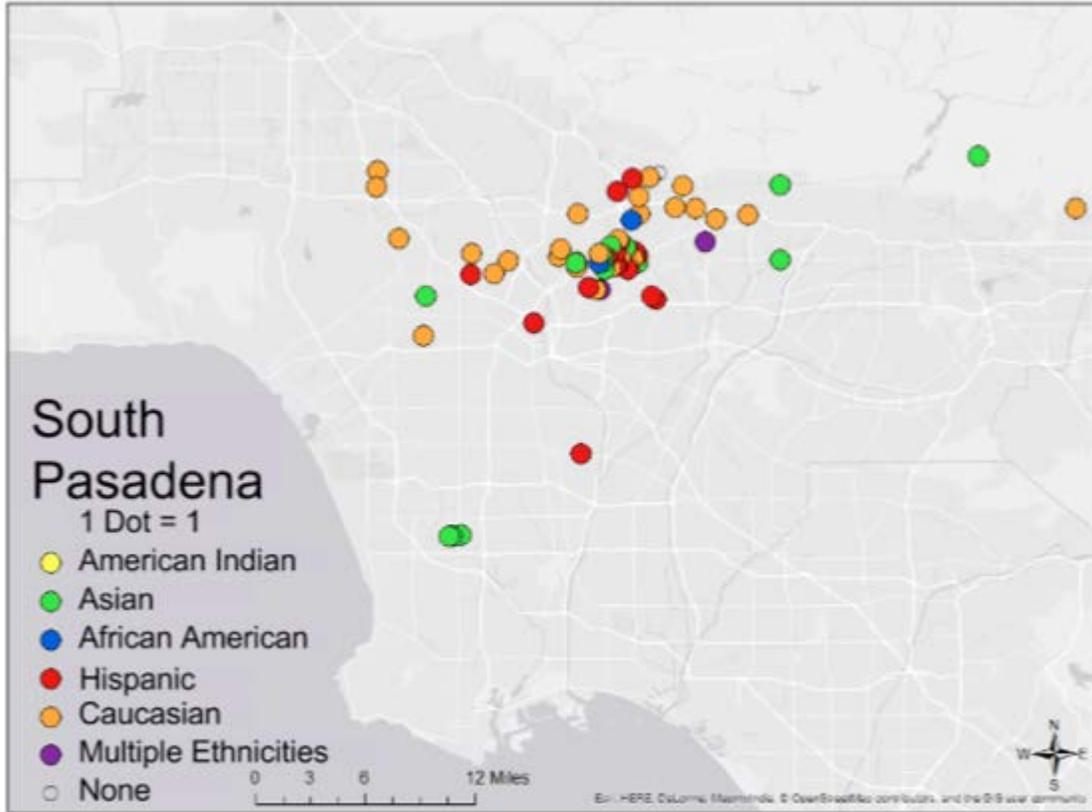


Figure 4.

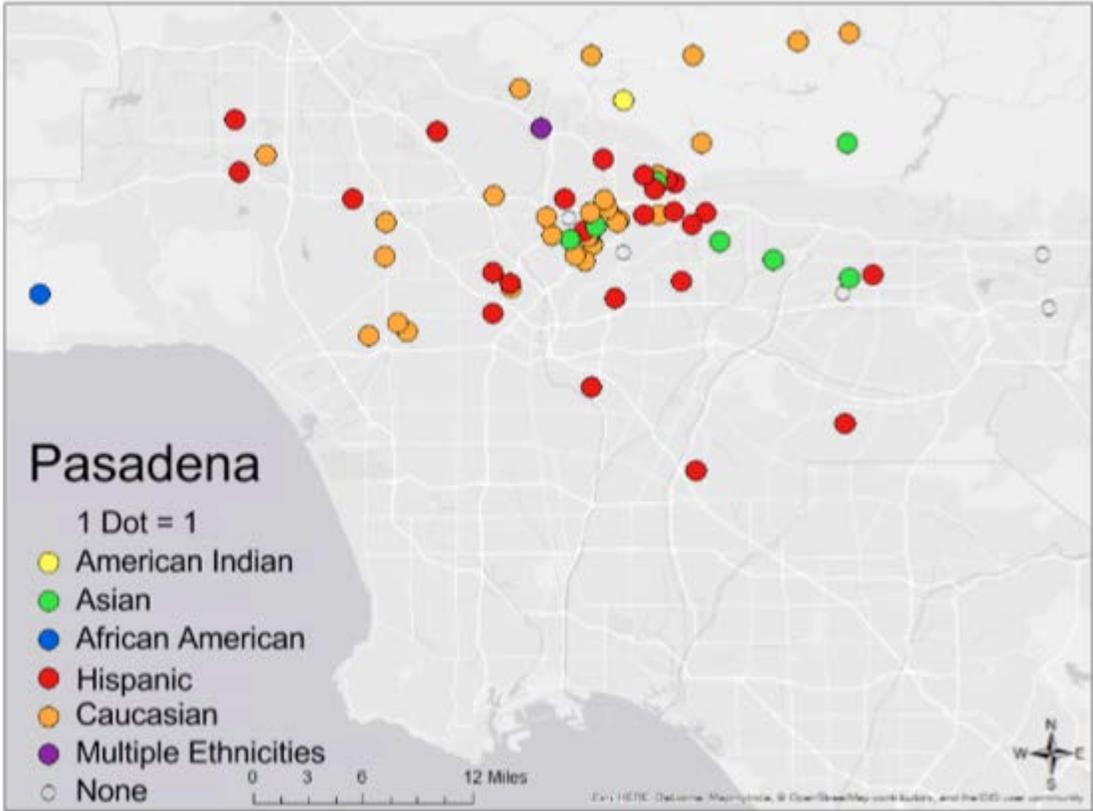


Figure 5.

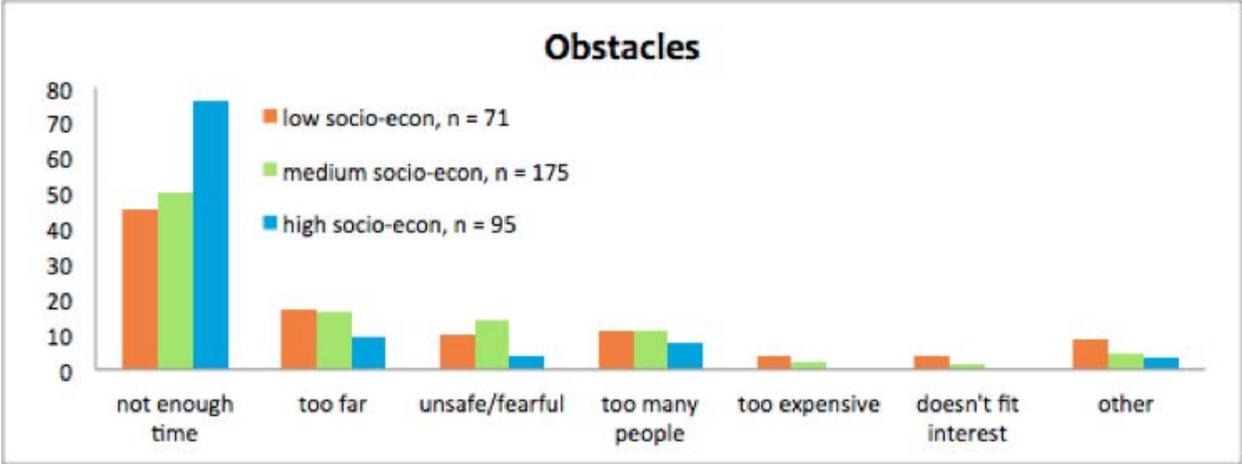


Figure 6.

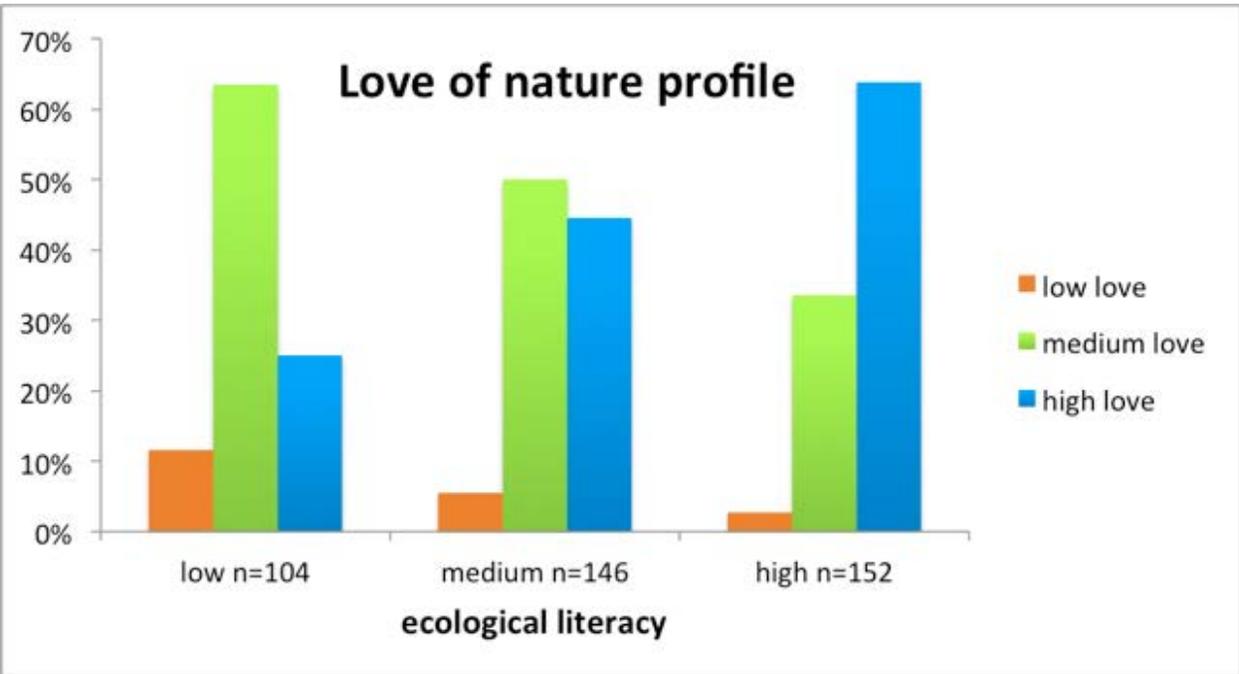


Figure 7.

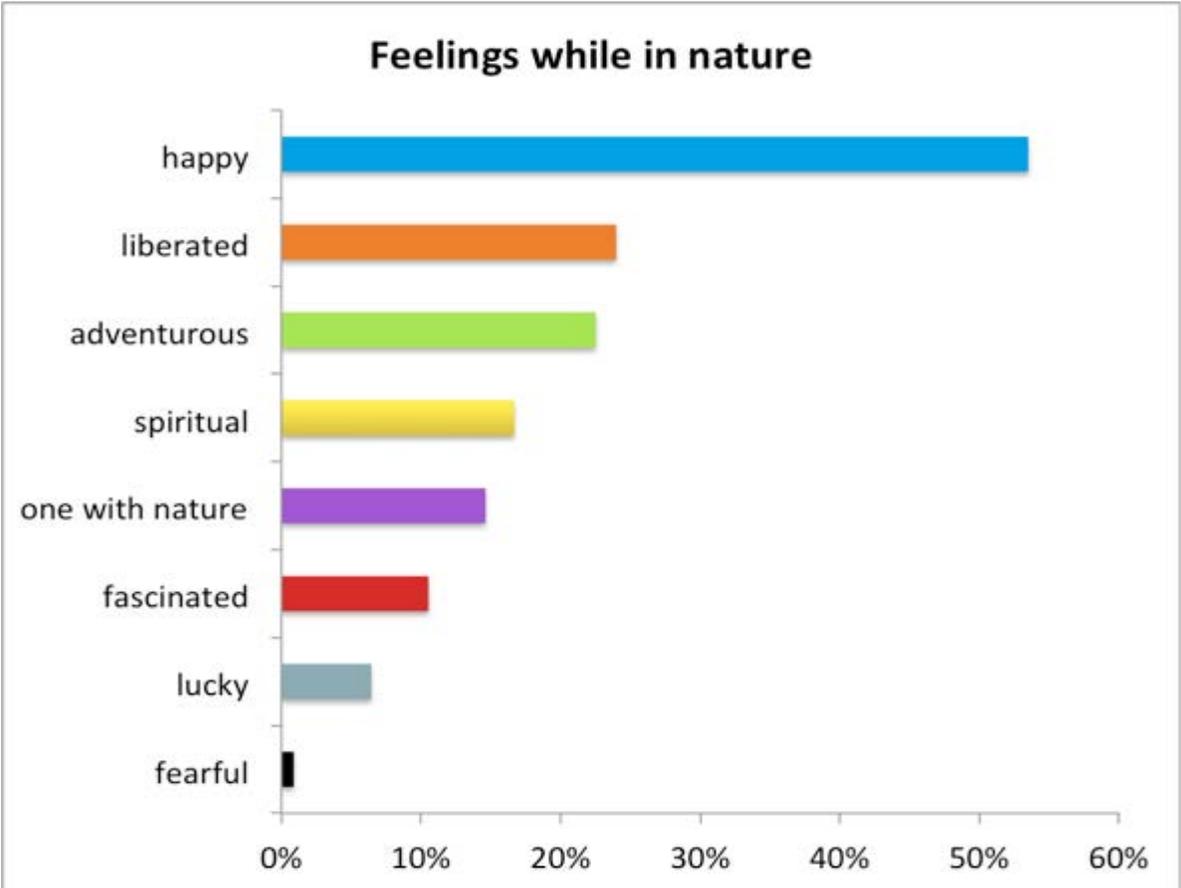


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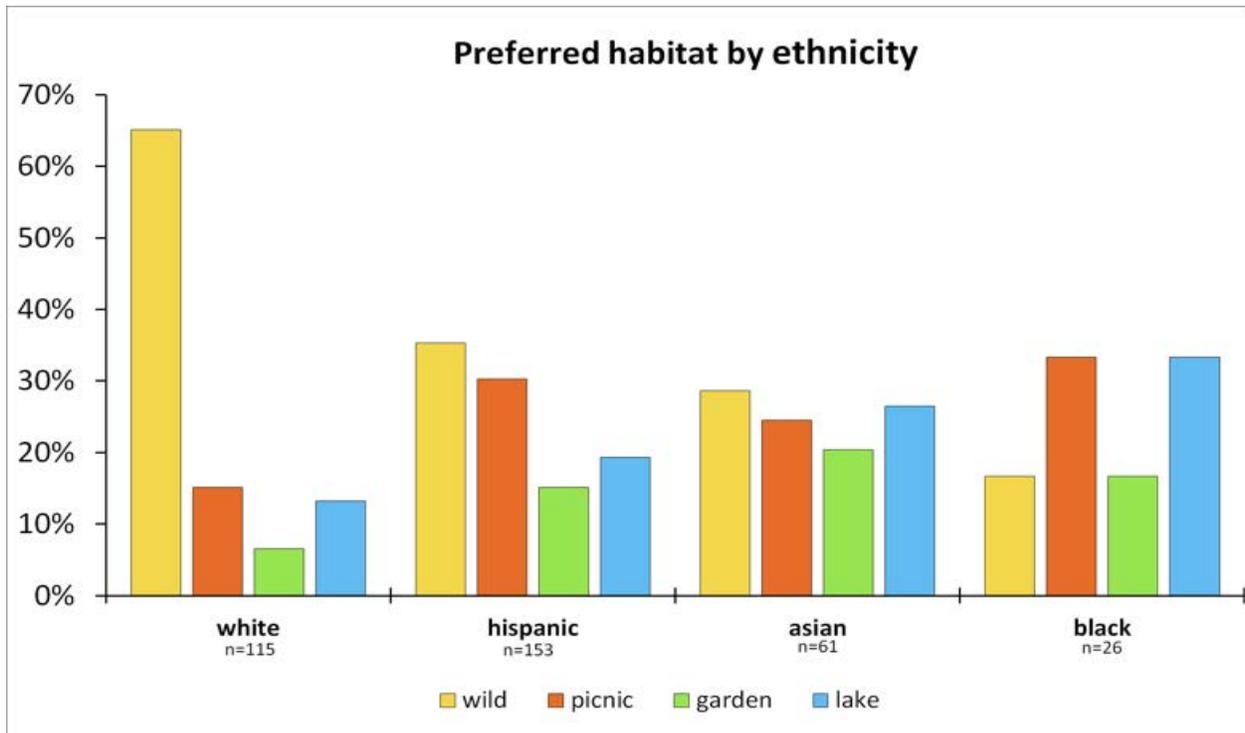


Figure. 9

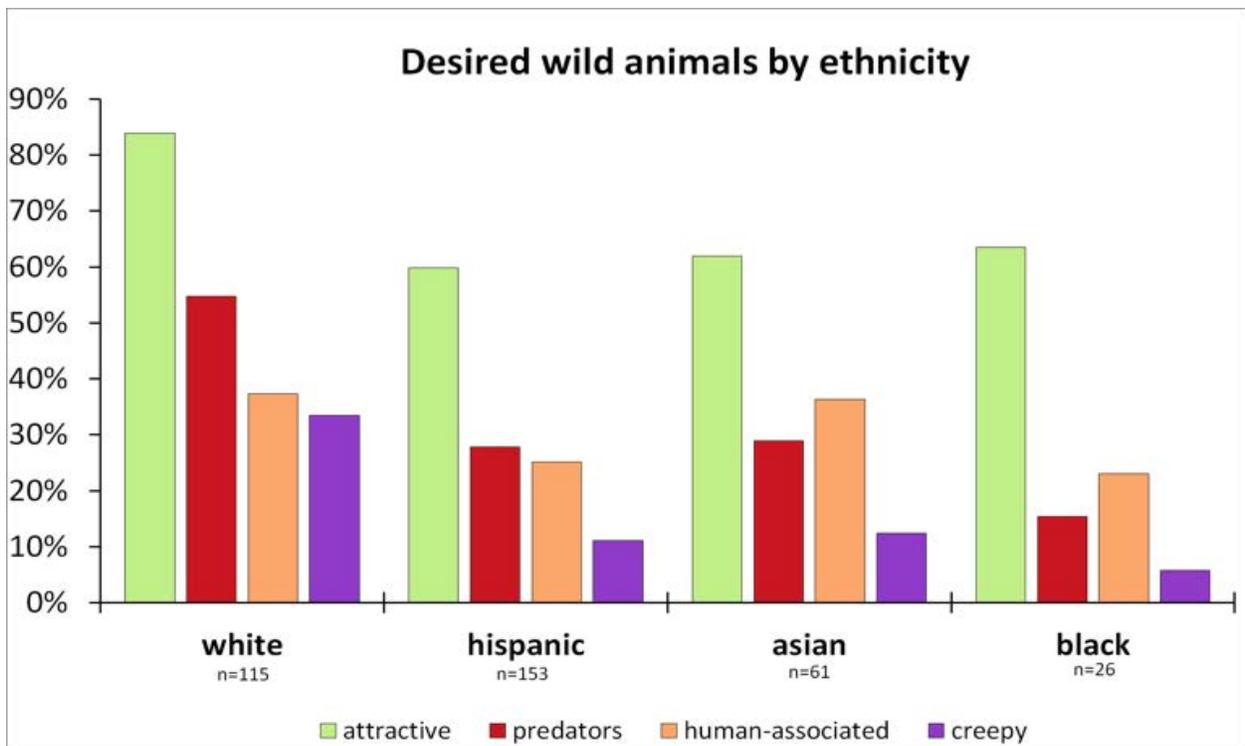


Figure 10.

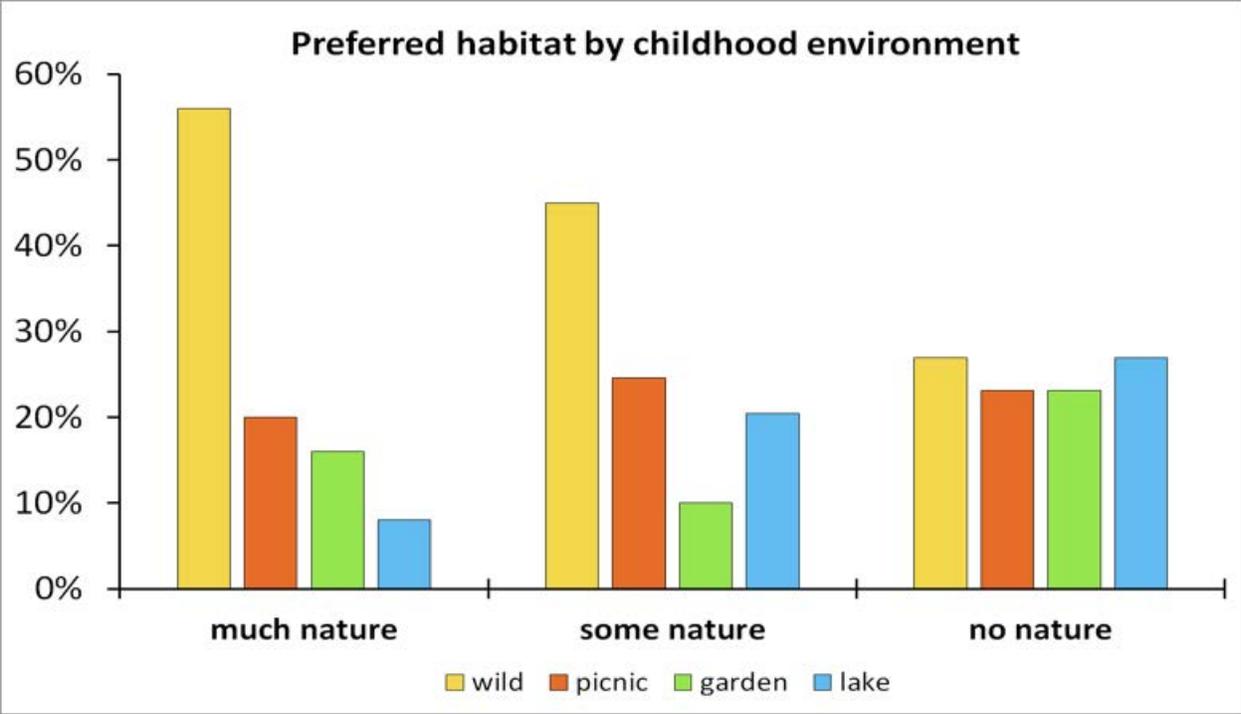


Figure 11.

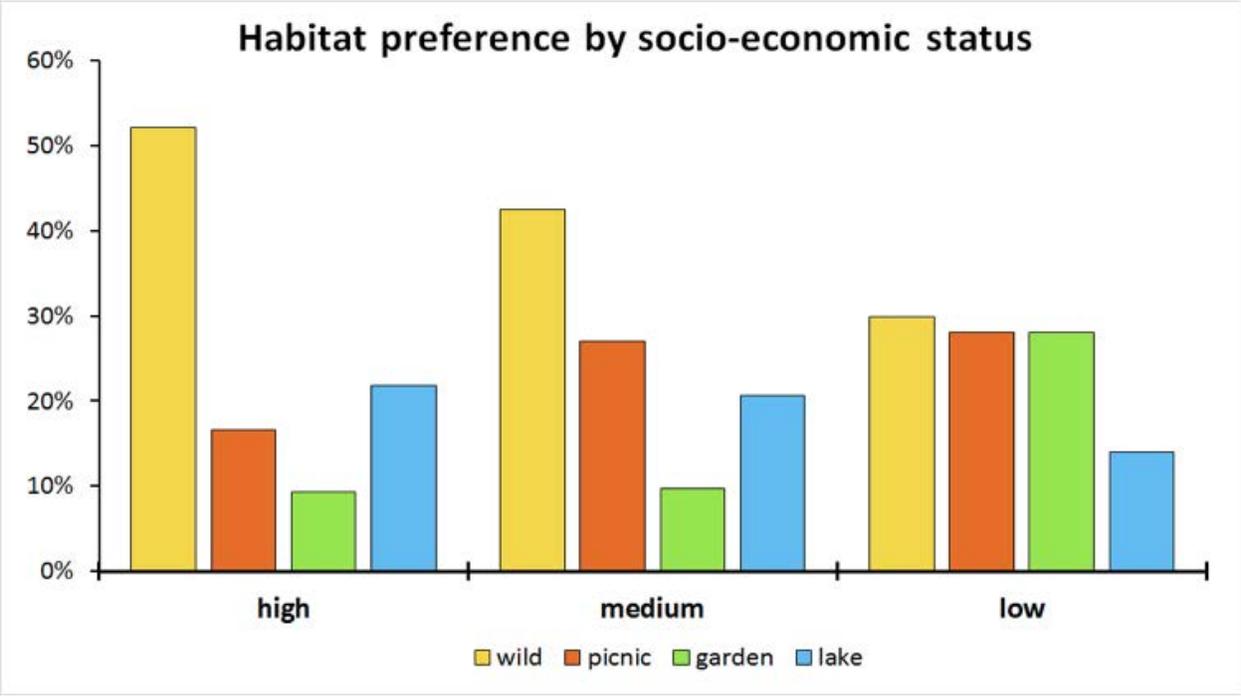


Table Legend

Table 1. Demographic information about population in study sites (Source: The LA Times)

Table 2. Combination variables with associated survey questions

Table 1.

Site	Median Income	% White	% Hispanic	% Asian	% Black	Median Education Level
Echo Park	31-60K	49.4%	26.0%	7.8%	5.2%	Bachelor's
Koreatown	0-30K	7.8%	42.9%	33.8%	13.0%	Associate's
Pasadena	31-60K	42.6%	39.7%	8.8%	5.9%	Bachelor's
S. Pasadena	61-100K	51.5%	22.1%	19.1%	2.9%	Bachelor's
Lincoln Heights	0-30K	8.9%	65.6%	12.2%	7.8%	Some College

Table 2.

Ecological Literacy	22	23	24	25; part one
Classical Love of Nature	9	13	14	25; part one
Socioeconomic	6	7		
Creepy animals	15; Tarantula	15; Snake		
Attractive animals	15; Songbird	15; Deer		
Predatorial animals	15; Hawk	15; Coyote		
Human associated animals	15; Pigeon	15; Raccoon		
Much Childhood Exposure to Nature	11; Farm or ranch	11; Other rural setting		
Some Childhood Exposure to Nature	11; City or town with parks or nature nearby	11; Suburbs		
No Childhood Exposure to Nature	11; A city or town without much nature or parks			

Table. 3

	Wild	Picnic	Garden	Lake
White	65.10%	15.10%	6.60%	13.20%
Hispanic	35.30%	30.30%	15.10%	19.30%
Asian	28.60%	24.50%	20.40%	26.50%
Black	16.70%	33.30%	16.70%	33.30%

$\chi^2 < 0.0001$ Pearson Chi-Square Test Significance: Habitat Preference by Ethnicity

Table. 4

	Attractive	Predator	Human- Associated	Creepy
White	83.91%	54.78%	37.39%	33.48%
Hispanic	59.80%	27.78%	25.16%	11.11%
Asian	61.98%	28.93%	36.36%	12.40%
Black	63.46%	15.38%	23.08%	5.77%

$\chi^2 = 0.002$ Pearson Chi-Square Test Significance: Wild Animal Preference by Ethnicity

Table. 5

	Wild	Picnic	Garden	Lake
Much Nature	56.00%	20.00%	16.00%	8.00%
Some Nature	45.00%	24.58%	10.00%	20.42%
No Nature	26.92%	23.08%	23.08%	26.92%

$\chi^2 < 0.001$ Pearson Chi-Square Test Significance: Habitat Preference by Childhood Exposure to Nature

Table. 6

	Wild	Picnic	Garden	Lake
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High	52.08%	16.67%	9.38%	21.88%
Medium	42.53%	27.01%	9.77%	20.69%
Low	29.82%	28.07%	28.07%	14.03%

$\chi^2=0.002$ Pearson Chi-Square Test Significance: Habitat Preference by Socio-Economic Status

Table. 7

	Not enough time	Too far	Unsafe/fearful	Too many people	Too expensive	Doesn't fit interest	Other
Low n = 71	45.1%	16.9%	9.9%	11.3%	4.2%	4.2%	8.5%
Medium n = 175	50.3%	16.6%	13.7%	10.9%	2.3%	1.7%	4.6%
High n = 95	75.8%	9.5%	4.2%	7.4%	0%	0%	3.2%

$\chi^2=0.005$ Pearson Chi-Square Test Significance: Obstacles by Socio-Economic Status