

AGE AND GENDER DIFFERENCES IN THE BEHAVIOURAL RESPONSE TO DISCRETE ENVIRONMENTAL STIMULI

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Abstract:

The relevance of landscape perception gains significance in understanding human behavior from an evolutionary perspective. Differences in the response to landscapes can either be caused by differences in the evaluated landscapes or by differences in the people evaluating. Lyons (1983) found that landscape preferences differed according to age and gender. Similar findings by Balling & Falk (1982), Gibson (1979) and Heft (1988) strengthen this point. The presented study, however focuses not on changes in the response to whole landscapes, but to discrete stimuli. In an experimental setting four stimuli, water, plants, animals and prospect refuge qualities were manipulated and the behavioral response of 4.050 persons was videotaped and coded. Results and impacts of this survey are discussed.

Introduction:

Evidence from evolutionary psychology suggests that environments which satisfy human biological needs evoke well-being and a feeling of safety. These emotional responses positively influence individuals' duration of stay within such environments (Orians & Heerwagen 1992; Schäfer, Atzwanger, Wallner, & Grammer 1999). To test the heuristic model of evolutionary psychology within the field of customer behavior, four elements of the savannah theory were selected (Orians & Heerwagen 1992). These four elements - prospect refuge, phytophilia, hydrophilia, and zoophilia - elicit strong responses and are easy to manipulate in experimental settings (e.g. Kuo, Bacaicoa, & Sullivan 1998). The prospect refuge quality allows for viewing the surroundings without being seen and therefore increases the feeling of safety (Ruddell & Hammitt 1987; Fisher & Nasar 1992; Schäfer, Atzwanger, Wallner, & Grammer, 1999). The affinity to plants is called phytophilia. Evidently, plants positively affect well-being, reduce stress and stimulate cognitive activity (Ulrich et al. 1991; Kuo, Bacaicoa, & Sullivan 1998). Hydrophilia is defined as the preference for water as a visible feature (Herzog 1985). Water as part of an environment increases well-being, activates social and exploratory behavior (Pitt 1989). Zoophilia, the affinity to animals, has been described similarly (e.g. Orians & Heerwagen 1992). The duration of stay, interaction rates and explorative behavior are relied upon as relevant parameters for well-being, because both behavioral parameters are increased by the emotion-motivation mechanism when a place is experienced positively (Mehrabian &

Russell, 1974; Zimbardo & Weber, 1994). These parameters have been applied in different contexts in empirical studies (e.g. Schäfer, Atzwanger, Wallner, & Grammer, 1999). Duration of stay is a relevant variable, because people tend to avoid places experienced as unpleasant and longer duration of stay correlates with feelings of security and well-being (Gates & Rohe, 1987). Interaction rates and explorative behavior were attributed to well-being by Weisfeld (1999). Pitt (1989) investigated the effect of waterscapes on social behavior and observed larger group sizes and higher affiliation among river recreationists than among other outdoor recreationists. In their 1998 study, Kuo, Bacaicoa and Sullivan concluded that environments with nature-like features motivate social behavior.

Individual Differences

Lyons (1983) found that landscape preferences differed according to age and gender, with older people expressing lower preference ratings in all categories compared to younger people, and females preferring more vegetation than males. However, no theories were offered as to why or how this might occur. Differences in landscape perception and preference according to age have been found in several other studies. Gibson (1979) and Heft (1988) found that there is a perceptual difference that varies with age, with children interpreting the landscape and terrain in terms of functions, and adults tending to interpret the landscape terrain in terms of forms. At age eight children select the savanna landscape as their preferred place to live in and to visit. By age 15 this changes such that savanna landscape, deciduous forest, and coniferous forest are liked equally well (Balling & Falk, 1982). Relph (1981), in his analysis of the psychological experience of space, explained that “all places and landscapes are individually experienced, for we alone see them through the lens of our attitudes, experiences, and intentions, and from our own unique circumstances (p.36)”. While evolutionary theory acknowledges that the ‘lens’ of human experience is set within a framework of evolutionary developments and species-specific perceptual constraints, the idea that individual differences and unique contextual circumstances might influence habitat tastes is certainly not precluded. Even more to the contrary, theory and research in the area of group differences is fully essential, as it is an important way to learn about the subtleties of aesthetics and evolved strategies. Because a suitable habitat must provide resources for carrying out many different activities over varying time frames, evaluation of habitats is a complex process for organisms (Orians, 1980). The current status of a landscape is important, but the organism must also evaluate future states. Being sensitive to predictive mechanisms and learned information about an environment that relate to one’s current and future goals would be advantageous. It might be hypothesized, for example, that aesthetic preferences will differ between men and women due to sexual differences in habitat use over evolutionary time. Differences in evolved psychologies should cause differences in drive state, thereby influencing affect.

Methodology

The control setting of phase one consisted of wooden benches, wooden pillars and a vending machine. For the experimental settings partitions (prospect refuge), ornamental plants (phytophilia), fountains (hydrophilia), artificial birds (zoophilia) were added. These four environmental items were used in different combinations in order to test combinations of stimuli against the control setting and against each other. Data was gathered by observing (videotaping) the individuals’ behavior. During three months, 312 hours, approximately 250.000 persons, were recorded on

videotapes. The recreational area (4.2 x 2.1 meters) plus part of the surrounding environment (8.9 x 6.2 meters) were monitored by a digital video camera. The camera was positioned 4 meters above the experimental setting. The data has been processed digitally by the capturing and targeting software COM-Meter (Moll 2001). Additionally, the data was coded and then analyzed using SPSS.

Hypotheses

The study tested two sets of hypotheses. The first set investigated the role of age and gender on peoples response to refuge values of the environment. The second set of hypothesis focused on explorative behavior. Men and women are expected to show different intensity of explorative behavior depending on given environmental items.

Response to Refuge Values

To test the behavioral response to refuge qualities of the experimental environment we used two partitions which provided visual protection against passersby. We expected a higher duration of stay and higher rates of interaction and exploration and we expected these effects to be different according to age and gender.

Firstly we hypothesized that children would response stronger to refuge qualities as children need more protection than adults.

The duration of stay of two age groups, four to fifteen years and sixteen years to forty-four years was measured in each two settings, one with partitions and one without partitions. The sample size was 178. In the control group the duration of stay dropped 23 percent from 314.7 sec to 242.32 sec (effect size $d = 0.2$) when the partitions were not on site. In the group aged four to fifteen the duration of stay dropped 48 percent from 309.9 sec to 161.05 sec (effect size $d = 0.52$) when the refuge qualities of the environment were removed. It seems the positive emotional response to environmental items that provide refuge qualities is stronger in children than in adults.

A similar finding would have been expected for elderly people, but unfortunately the sample size for this age group was to small.

But we also expected a gender difference for the response to refuge qualities with men preferring higher prospect values and women preferring higher refuge values in an environment. Accordingly the duration of stay of women should be more reduced when the refuge qualities of the environment are lowered than the men's duration of stay. In our sample ($N = 198$) we measured a reduction of 25 percent (from 257.9 sec to 193.3 sec) in women and only a reduction of 19 percent (from 288.07 to 231.83) in men. The effect size dropped from 0.2 (women) to 0.16 (men). Data suggests that women respond stronger to refuge qualities of an environment.

Finally we hypothesized that interactions between child and mother/father would be more sensitive against reduced refuge qualities than interactions between adults. We measured the duration of body contacts with children and the body contacts between adults in two settings ($N = 294$). The duration of interaction with children was reduced by 22 percent (from 32.15 sec to 24.96 sec) when the partitions were removed. The duration interaction between adults, which was naturally smaller to begin with, was not reduced at all (from 6.28 sec to 6.82 sec). This result shows that caring interactions between child and parent are more dependent on refuge qualities than social interactions between adults.

Responses to water-, plant-, and animal stimuli

The given set of observational data which included more than 4000 persons could not confirm any literature based hypotheses on the influence of age or gender in the response to water-, plant- and animal- stimuli concerning duration of stay or rate of interaction. There are, however, some findings on explorative behavior which should be addressed.

In the first step a control setting without above mentioned stimuli was tested against an experimental setting with water-, plant- and animal- stimuli. The percentage of persons who showed explorative behavior (i.e. touched some item of the recreation area) more than doubled from 0.38 percent to 0.9 percent.

The second step was to detect which of the environmental stimuli caused the increase. One at a time each stimuli was removed and the reduction of in exploration rate was recorded against the environment containing all stimuli which was used as control setting for this phase of the study. When the plant stimuli were removed the exploration rate dropped from 0.9 percent to 0.58 percent. When the water stimuli were removed the exploration rate was reduced to 0.59 percent and when the animal stimuli were removed the exploration rate was reduced to 0.41 percent. Most of the explorations were people touching the animal stimuli and water stimuli. Therefore the reduction of the exploration rate if one of these stimuli is missing is not very surprising. The reduction caused by the removal of the plant stimuli was quite unexpected.

When we controlled against gender effects we realized that the response to the removal of the plant stimuli in the exploration rate was entirely caused by the males. While the female's exploration rate is virtually the same in the control group with all stimuli and the experimental group with the plant stimuli missing the male's exploration rate is responsible for the reduction of the samples reduction from 0.9 to 0.58 percent (sum chi² = 33.84; df: 4; sign = 0.001).

Conclusion

This study set out to investigate age and gender differences in the behavioral response to environmental stimuli. The findings show that the evaluation of prospect refuge qualities of an environment are greatly influenced by age and gender. It seems that in the habitats where our ancestors evolved individuals which were less able to defend themselves needed to prefer places with higher refuge values than others. The very obvious idea that also parent/child interaction takes place preferably in an environment with high refuge values could be tested and confirmed. It is surprising that the refuge value of a crowded place like a shopping mall can be so easily raised by means of a partition. The influence of age and gender of the behavioral response to water-, plants- and animal stimuli could not be thoroughly investigated in the chosen experimental setting. However, the data on the influence of plants on the explorative behavior of male humans shows that patient observing is still a way to dig up surprising clues that might lead to more questions and more theories.

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