

Project Overview

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Project Title:

Pathways: From the Lab to the Neighborhood
An Interactive Living Exhibit for

Advancing STEM Engagement with Urban Systems in Science Museums

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This PATHWAYS project is designed to develop a model for integrating the emerging science of urban systems into exhibits in urban science museums. This model is being piloted through the development of the *City Science* exhibit at the EcoTarium in Worcester, MA. The project will study how exposure to exhibits focusing on urban biodiversity, land use change, and urban heat islands influences visitors' neighborhood design decisions.

Project team members

EcoTarium Staff: Shana Hawrychak, Alice Promisel, Eric Zago, Don Biehl, Don Ricklin. Evaluation consultant: Jacqueline DeLisi, from Education Development Center (EDC) Curriculum: Patricia Amarillas (Loyola Marymount University) Graduate students: Jane Buxton and Benedita Silva Pinto (University of Massachusetts-Amherst); Will Collier, Marissa Gallant, and Kelsey Shields. (Clark University) Undergraduates research assistants: Alex Merriam and Alexandra Knopf (Clark University), Caroline Fay (University of Massachusetts- Amherst), Jeremy Marshall (Clark University)



Exhibit Overview

Opening fall 2016

A permanent exhibit exploring the science all around us, from infrastructure engineering to changing landscapes to urban adaptations.. The exhibit, will blend living and natural history collections with interactives in seven thematic areas. Partnering with the researchers of the ULTRA-Ex project allowed us to infuse current biology and social science research into interactives exploring:

- Urban biodiversity ("Best Nest," formerly "City Bird Scientist"),
- Land use/Land cover ("Turtle's Eye View")
- Urban heat islands ("City Hot Zones")
- Urban design ("Magnetic Neighborhood")



Best Nest



Turtle's Eye View



City Hot Zones



Magnetic Neighborhood

Magnetic Neighborhood: Testing an Exhibit Prototype as a Potential Evaluation Tool



What is "Magnetic Neighborhood"?

An interactive where visitors build their "ideal neighborhood" on a cookie tray using magnets of various urban features: housing, business, municipal facilities, transportation. The size of the trays are deliberately small, which prototyping revealed was most effective at sparking group discussions about cost- benefit analysis and about personal and civic values.

Goals:

- to serve as a stand-alone interactive, exploring personal values in urban planning;
- to foster visitor participation in social science research; and
- to test the interactive as a potential embedded evaluation tool.



Making a Neighborhood



Magnet with Top Code



Reading the Neighborhood

Phase II Testing (2015): Top Code Reader

- Question 1: Can top codes be used to automate the collecting analyzing of data to capture larger sample sizes?
- Question 2: Will visitors opt to "answer questions for science" via a computer interface?
- Question 3: Are visitors interested in comparing their neighborhood to others' neighborhoods?

Using an open-source product, we added top-codes to the magnets. After building their neighborhood, visitors inserted their tray into a reader, which they operated via a touch screen.

Successes:

- Adding top codes did not interfere with visitors' use or understanding of the interactive.
- Visitors loved seeing their tray on screen.
- Visitors were willing to answer questions about which exhibits they had visited before photographing their tray.
- Visitors did want to compare their neighborhood with the neighborhoods of others in their group/family.
- A sub-set of visitors willing to answer additional "questions for science", after photographing their trays.

Challenges:

- The open-source top code reader was very unreliable, with very inconsistent errors, so this system could not do reliable back-end data analysis of the trays. (They are being hand-analyzed.)
- The majority of visitors recorded only visiting one exhibit before magnetic neighborhood. However, comparison with data from concurrent observation of visitor behavior indicates that this is an artifact of poor question structure or user interface, not an accurate report of behavior.



Magnetic Neighborhood Screen Shots

Magnetic Neighborhood Phase I Testing (2014): Paper Passports

Question:

Do visitors exposed to urban ecology interactives design greener neighborhoods than those without such exposure?

Set-up:

Interactive prototypes; three on urban environmental topics, plus Magnetic Neighborhood were set up around the museum. Shaped punches on passports recorded which visitors had visited which interactives before Magnetic Neighborhood. Visitors who started at Magnetic Neighborhood served as controls. At Magnetic Neighborhood, visitor's trays were numbered and photographed, visitors were interviewed, and their passports were collected and marked with the matching number.

Success:

Yes, the magnetic neighborhoods could serve as an evaluation tool, when combined with other sources of data (passports, interviews).

Indications are that magnet trays could capture differences in neighborhood designs (e.g. amount and diversity of green space, connectivity of green space), and with sufficient sample size, could capture correlations, if they exist.

Challenges:

- Very labor-intensive to run the passport process and to hand-analyze each visitor's neighborhood; which leads to:
- Small sample sizes.

Parallel University Study

"Understanding Urban Greening and Tree Canopy as part of an "Ideal Neighborhood""

by Jane Buxton and Robert Ryan, PhD
UMass Amherst



Research question:

Will urban greening help offset lower preference for higher density?

- Photo preference survey used 24 photos of residential and mixed use neighborhoods in Massachusetts and Rhode Island.
- Some photos were manipulated to incorporate more greening.
- Survey also contained 2 short answer questions regarding why some photos were more or less preferred.
- N = 130 surveys completed in 2015 at the EcoTarium, "Earth Day" celebration and at Worcester "Spring Festival" adjacent to City Hall.

Results:

- Lower density photos rated higher than higher density photos
- Greened photos were preferred over non-greened photos
- Results indicate a tension between higher density and what people want. Density matters a lot in an ideal neighborhood.
- Results indicate the ability of trees to ameliorate that tension up to a point, as shown with the manipulated photos.
- We can increase people's acceptance of density by neighborhood greening.
- If planning for higher residential densities is going to work, people will need to choose those settings, even if they have the means to choose lower density settings.



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