

Ames Chairs

Post-Redesign Evaluation

Adam Klinger and Nina Hido
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THIS IS A POST-REDESIGN EVALUATION REPORT

After an exhibit has been renovated, redesigned, or refurbished in preparation for the Exploratorium's move from the Palace of Fine Arts to Pier 15, an interview and observation study is conducted. The purpose of the study is to identify any major issues that would require immediate attention prior to the move. This collection of redesign evaluations will serve as a baseline of information for the Exploratorium's new exhibit set at Pier 15.

Post-redesign studies like this one **are conducted quickly**, which may mean:

- small sample sizes
- expedited analyses
- brief reports

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Study Goals

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General goals:

- To confirm that visitors are able to access and use the exhibit
- To confirm that visitors can build a basic understanding of the exhibit's content
- To uncover visitors' frustrations and confusions
- To understand whether visitors move on from an exhibit for intrinsic or extrinsic reasons

Exhibit Description

This exhibit allows visitors to view perspective in two ways. Looking through front viewing holes, they see three identical chairs made out of separate wire threads. Each set of threads makes an identical image in the eye. Viewing from the top, it appears that the threads don't form chairs, but an intricate maze of thread.



Methods

Uncued observations and interviews were conducted. A researcher randomly selected visitors who crossed an imaginary line on the floor that stopped facing the exhibit with two feet planted and either looked at or touched the exhibit for approximately 15 or more seconds.

Uncued visitors do not know they are part of the study until after they finish using the exhibit so their behavior can be considered representative of normal use patterns. This means that some of the visitors in this study may have used the exhibit only briefly.

Visitors were approached after they left the exhibit and asked if they would be willing to participate in a 7-question interview about their experience at the exhibit.

Demographics

Gender	Count (N=12)
M	7
F	5

English as a Second Language?	Count (N=12)
N	12
Y	0

Estimated Age	Count (N=12)
8-12	1
13-17	3
18-29	2
30s	1
40s	1
50s	1
60+	3

Visitor Group Composition	Count (N=12)
Adults-only	4
Adults with children	2
Adults w/ teens	3
Adults w/ teens and children	3

Findings

Holding Time

This is the time the visitor spent using or otherwise engaged with this exhibit. The amount of time a visitor spends at an exhibit is influenced by many factors and can indicate level of engagement or interest, but not as a measure on its own.

Time at exhibit	mm:ss (N=12)
Mean	0:34
Median	0:29
Minimum	0:18
Maximum	1:10

Visitor Behaviors

Visitors were observed as they used various parts of the exhibit.

Look through left (realistic) eyepiece?	Count (N=12)
Yes	12
No	0

Look through center (single-plane) eyepiece?	Count (N=12)
Yes	11
No	1

Look through right (deconstructed) eyepiece?	Count (N=12)
Yes	11
No	1

Visitor Interest

Visitors were asked about their interest in the exhibit and why they rated from “not interesting” to “very interesting” (1 – 7).

Interest Level	Count (N=12)
High Interest (6-7)	7
Moderate Interest (4-5)	3
Low Interest (1-3)	2

Visitor responses:

H	The third instance (right eye hole)...I'm a math teacher...So my hypothesis is that all that is required would be a connection between any two of the lines. The fact that the third instance works is counterintuitive until you look at it. The string is blocking the light along the same path. It could be fun to create the extremes to get the same phenomenon using the shortest or longest possible strings.
H	It talks about the constellations; I didn't realize how our mind uses what's familiar to see what's going on. I like how it applies it to a larger topic (the chairs to the constellations).
H	Interest in the perspective.
H	It wasn't surprising, I was expecting to see what I saw.
H	The strings matched up with the shapes and made a chair.
H	It was interesting because the sticks are in different positions but you still see the same shape, interesting how your eyes work like that.
H	The illusion. Your able to put to separate images together to make a new image.
M	I liked that it was effective in showing the principle, is different from what you see in the eyehole to on top. It was a quick experience though.
M	It was cool because when you look at it from different angles it just looks like strings, but then it looks like a chair.
M	Pretty cool with the strings, how they look like an object from one way.
L	It was just kind of blah, I wasn't taken aback.
L	Wasn't that interactive but still cool to look at.

Visitor Frustration or Confusion

Visitors were asked to tell us if there was anything confusing or frustrating, what the source of the frustration was, and whether or not it made them want to leave the exhibit and move on to another one.

Source of visitor frustration or confusion*	Count	# that wanted to move on
Nothing Frustrating or Confusing	12	0

*Totals may add up to more than N = 12 because visitors gave more than one response.

Visitor Understanding

Visitors were asked what they think the exhibit was about with the goal to determine whether or not they have a basic understanding of the concepts presented and to identify possible areas of misunderstanding. We acknowledge that this study has a small sample size and that these findings illustrate trends and may not be representative.

It appears that visitors DO have a basic understanding of concepts presented.	X
It appears that visitors DO NOT have a basic understanding of concepts presented.	

Visitor responses:

- Perception, visual system/what your retina "chooses" to see - interesting that it's a "choice."
- Perspective.
- More than one way to make a chair.
- Talking about how the eye constructs things, takes information in and constructs the best image, also perspective.
- Optical illusion.
- Don't know.
- Different angles, how things look different from different angles and distances.
- When you look at something from a certain way it changes the perspective, I need to read more about it though.
- Optical illusions.
- Perspective, can have several meanings; can be how we perceive depth or your point of view, for example from the side you see disorder but through the eye piece you see total order.
- That our eyes can trick us, its mind-blowing stuff.
- Illusions.

Visitor Reasoning for Leaving the Exhibit

The goal of this question is to explore how open or closed-ended the exhibit seems to be for the visitor. Visitors tend to leave exhibits for intrinsic reasons, such as feeling bored, or finished with the experience, or for extrinsic reasons, like having to go to lunch or being distracted by another exhibit. Leaving for intrinsic reasons could suggest a more close-ended exhibit experience.

Reasons for moving on to the next exhibit	Count (N=12)
Extrinsic	7
Intrinsic	5

Visitor responses:

Extrinsic	Wanted to see if you would show me how it works in (outer)space.
Extrinsic	Move on to see more of other things.
Extrinsic	Saw the other chairs.
Extrinsic	Because I wanted to see another exhibit.
Extrinsic	I am still interested/thinking about it, but I got a text from my family wondering where I was.
Extrinsic	Something else caught my eye.
Extrinsic	My granddaughter.
Intrinsic	I felt like I got what I was going to get out of it.
Intrinsic	Wasn't very engaging, you look at it, see it, then move on.
Intrinsic	Looked through the whole thing, realized what it was then moved on to the next exhibit.
Intrinsic	Looked through all 3 holes and above.
Intrinsic	Fact that there was nothing else to do.

Conclusions

Based on this small sample, we conclude that the redesigned exhibit does not require immediate remediation. This evaluation did not identify sufficient impediments to visitor use, engagement or basic understanding.

APPENDIX: Redesigned Graphic Panels

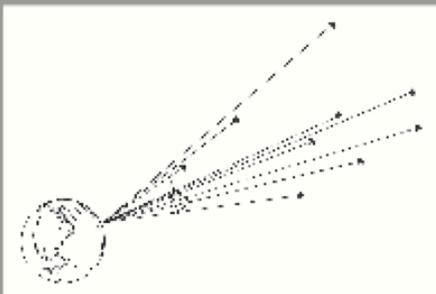
Ames chairs

- Look through the three white peepholes above. What do you see?
- Now look through the side or top of the box.

What's going on?

You know from looking through the top of the box that only one of the three objects is actually a chair. But all three objects produce the same image on the retina of your eye. Your visual system chooses to see the most likely object that would produce such an image—a chair.

This exhibit was made in the 1940s by Adelbert Ames, an artist and psychologist who invented many ingenious demonstrations showing that what we see often depends on what we expect to see.



Constellations are an example of the perspective illusion you see in this exhibit. The patterns we see from our vantage point on earth—such as Orion the Hunter—would look totally different in another solar system.

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