

Mind – Formative Evaluation Limelight

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February 2007

THIS IS NOT A DEFINITIVE FINAL REPORT

FORMATIVE evaluation studies like this one often:

- **are conducted quickly**, which may mean
 - small sample sizes
 - expedited analyses
 - brief reports
- **look at an earlier version** of the exhibit/program, which may mean
 - a focus on problems and solutions, rather than successes
 - a change in form or title of the final exhibit/program

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PURPOSE

Limelight is a Mind exhibit prototype that is designed to simulate the experience of being on stage to encourage visitors to reflect on how they react to cheers and jeers from an audience. Visitors step into a dark room, the size of a closet, automatically trigger bright lights to turn on, and are encouraged to speak into a microphone. Speaking into the microphone then triggers canned responses from a fake audience that applauds, boos, and otherwise 'reacts' to what was said, although the system actually does not know *what* is said. The lights and the canned responses simulate the sights and sounds of being on stage in a large auditorium in front of a large crowd.

This formative evaluation gauges:

- What visitors did in Limelight. More specifically,
 - Did visitors enter individually or in groups?
 - Do visitors prefer using the exhibit alone or with others? Why?
 - What did visitors see and hear inside the exhibit?
- How did visitors react to the exhibit? Specifically, how did the exhibit make them feel?
- What did visitors think was the point of the exhibit?
- Did visitors think the experience was worthwhile? In what way? Why not?

Figure 1. Limelight

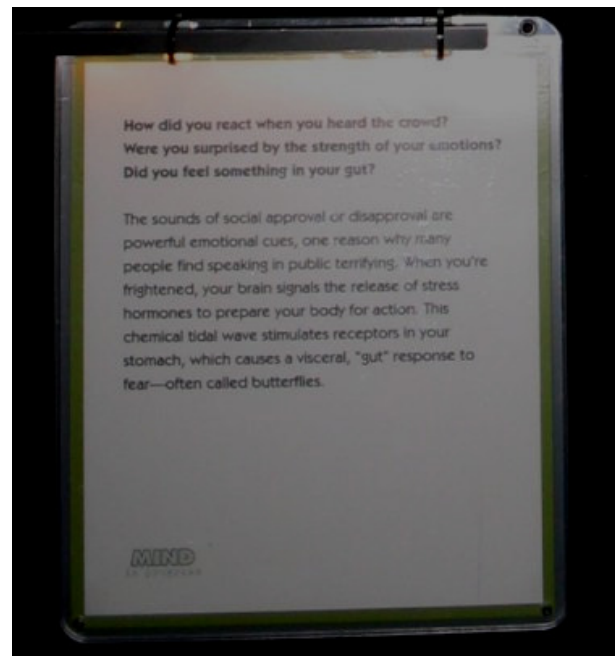
Entrance to Limelight



Inside the exhibit



The debrief near the exit



METHOD

An evaluator sat outside Limelight and selected every third visitor, 8-years old or older, who entered and stayed inside for at least 10 seconds. When the floor was very quiet, she chose every person, 8 or older, as separated by at least 10 minutes.

The evaluator noted how many other people the visitor entered with, if the light inside came on (indicating that they had triggered the audience responses), and if they interrupted others

already in the exhibit or if they were interrupted themselves. After observing a visitor, the evaluator approached that visitor for an interview. The interview questions are in Appendix A.

DATA

We collected data on Sunday, February 25 and Wednesday, February 28, 2007.

$N = 19$

Age Group	Count (out of 19)
Child	4
Teen	5
Adults	9
Seniors	1

Gender	Count (out of 19)
Female	10
Male	9

RESULTS

What did visitors do?

A majority (12/19 or 63%) of the visitors entered Limelight with someone else.

Size of the group entering together	Group Type	Count (out of 19)	Total Count (out of 19)
1 visitor	Individual child	1	7
	Individual teen	3	
	Individual adults	3	
2 visitors	Multigenerational	5	9
	Adult peer	4	
3 or more visitors	Multigenerational	3	3

Table 1 shows how visitors entered, alone or with someone else, and how they would have preferred to have used the exhibit, alone or with someone else.

Table 1. Preference for use

Actual Preferred	Entered Alone	Entered w/ Others	Total
Entered Alone	3	8	11
Entered w/ Others	1	2	3
Don't know (no preference)	3	2	5
Total	7	12	19

- Visitors who would rather try it alone thought it would be better alone because
 - The experience of being in the limelight would feel more authentic to being on stage (5/19).
 - Privacy is important for the experience (3/19).
 - Otherwise, other people would interfere with the controls (1/19).
- Visitors who felt that it would be better with other people thought
 - Having someone else hear you speak makes the experience less strange (2/19).
 - It's fun to listen to other people speaking into the microphone (1/19).
 - Young visitors may need help while inside the exhibit to understand what is happening (1/19).

All the visitors we interviewed reported hearing at least 2 different sounds. Visitors remembered hearing:

Sounds	Count (out of 19)
Boos	15
Laughter	11
Applause	11
Cheers	8
Others ('not welcoming sounds, screams, voices, "eww", whispers, hisses, bat sounds, crying, whistling')	1 each

Most visitors (18/19) spoke into the microphone. The one visitor who did not, had entered with someone else and listened while the other person used the microphone.

Twelve of the 19 visitors (63%) we interviewed entered the unoccupied exhibit. Eight of these 12 (67%) were interrupted while they were inside. That is; another person entered the exhibit while they were already inside.

- The other 5 (of the 8) did not feel that the interruption made any difference. Two of these visitors explained that this was because they knew the person who came in after they were already inside. For example,

Visitor13: About the same, if they are your friend. If not your friend, then it's kind of awkward.

- Three of these eight visitors thought the interruption made the exhibit experience worse. This is largely because it made them feel more self-conscious and less comfortable.

Visitor7: It ruined the entire experience [She says this in a joking manner to her friend who interrupted her in the exhibit. But then she further explains...] I did not feel as comfortable, could not be as expressive in speech. You are more self-conscious, can't muck around as much.

Visitor14: It made me nervous. You don't want to say something because people are outside. Didn't feel as comfortable saying things.

Visitor5: It heightened my anxiety that some was waiting outside for me to finish.

Seven of the 19 visitors (37%) entered while someone was already inside Limelight using the exhibit.

- Four of the 7 visitors said that they actually did not see what was going on while they were inside. These people, in fact, stepped out as soon as they realized that the exhibit was already occupied.
- The other three of the 7 visitors reported feeling more inclined to use the exhibit after seeing what happened inside. What they saw and heard piqued their interest.

How did visitors react to the cheers and jeers?

Table 2 summarizes how visitors perceived the size of the space. About half the visitors thought it felt like an auditorium or a similarly large space.

Table 2. Perception of the Size of Limelight

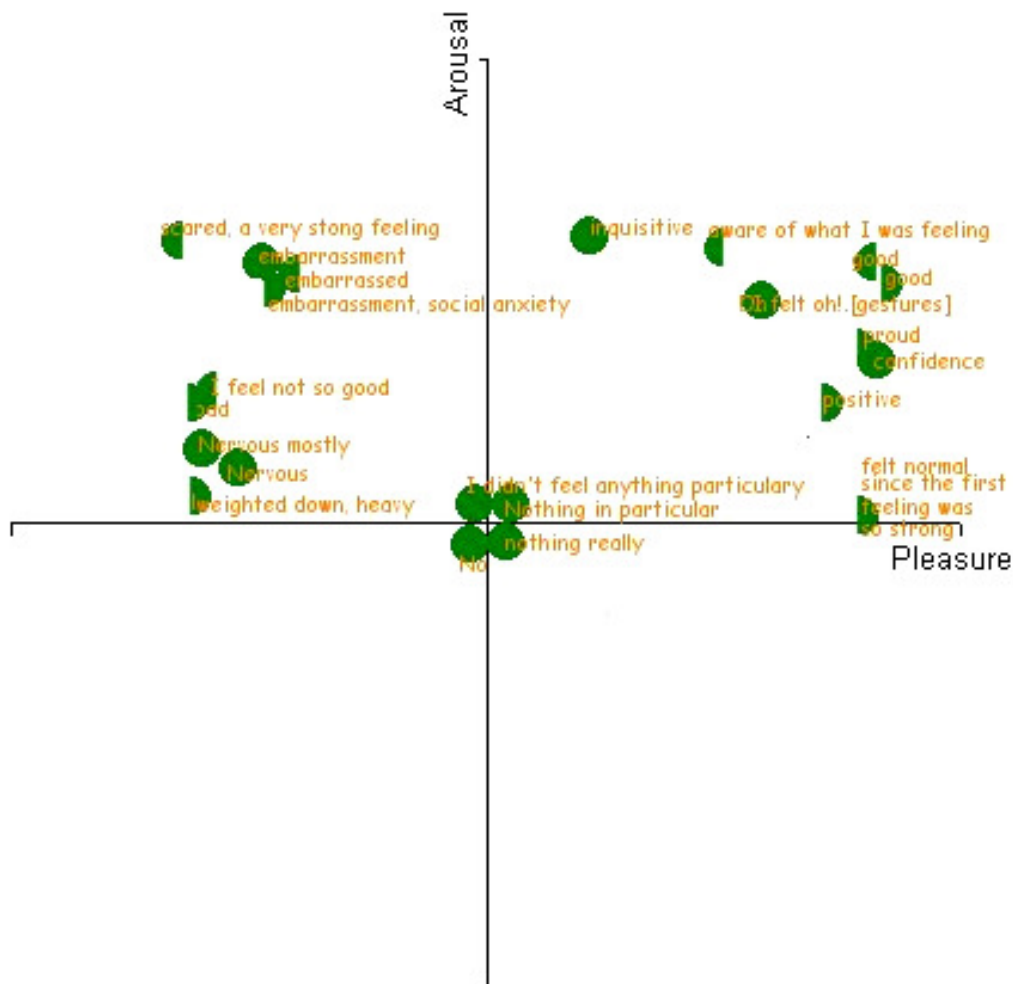
Size	Count (out of 19)
Large (auditorium)	10
Medium (large bedroom)	4
Small (closet)	5

We asked visitors how they felt while inside the exhibit and plotted their responses according to pleasure and arousal as shown in Figure 2. (Three of the 19 visitors could not articulate how they felt.) Four visitors reported feeling nothing. However, 6 other visitors felt both pleasant and unpleasant emotions in response to the different audience responses they heard, while the remaining 5 reported either a positive or a negative emotion. Note that a majority of the emotions fall in the upper half plane, indicating that visitors felt more excited than calm in the exhibit. In general the data shown in Figure 2 suggest that Limelight can elicit a range of excited emotions, both pleasant and unpleasant.¹

¹ We also asked visitors to tell us if their experience inside was pleasant, somewhat pleasant, neutral, somewhat unpleasant, or unpleasant, and if they felt excited, somewhat excited, neutral, somewhat calm, or calm. This was done as another way of measuring their emotional response inside the exhibit according to the two dimensions of pleasure and arousal. We then looked to see if there was a significant correlation in the pleasure and arousal ratings and the ratings derived by looking up the pleasure and arousal values for the words used in the Russell and Mehrabian (1977) study. We found a very weak correlation between visitors' self-reported pleasure and the derived pleasure ratings; *Kendall's tau* = .088, $p = .633 > .05$. And, we found a weak correlation between visitors' self-reported arousal and derived arousal ratings; *Kendall's tau* = .197, $p = .297 > .05$.

Given the weak correlation, we decided to consider the words visitors used instead of the pleasure and arousal ratings they gave. This is because we believe their verbal descriptions have more information. For example, visitors would describe how their emotions changed while inside the exhibit, which is difficult to capture with summary ratings. Also, we suspect that some visitors had difficulties parsing their emotions into these two dimensions.

Figure 2. How visitors felt inside as plotted according to pleasure and arousal. Green circles and semi-circles mark visitors' emotions on the pleasure and arousal plane. A semi-circle indicates part of all the emotions a visitor gave, whereas a full circle indicates all the emotions reported. Visitor's statements are in orange. Note that 6/16 visitors reported feeling a pleasant as well as an unpleasant emotion. The coordinates were roughly derived from a previous study by Russell and Mehrabian (1977) in which pleasure and arousal ratings were collected from about 300 subjects for 151 words denoting emotions. That is, we looked up the pleasure and arousal ratings from the Russell and Mehrabian study for words that visitors used to describe how they felt inside Limelight. In cases where they did not use any of the 151 words, we chose the closest approximation.



We suspected that visitors' reactions may differ depending on much visitors like being in front of a crowd in general. However, we found a weak correlation between their self-reports on how

much they (dis)like being in front of a crowd and their derived arousal rating²; *Kendall's tau* = .388, $p = .072 > .05$. And, we found a very weak correlation between their self-reports on how much they like or dislike being in front of a crowd to their derived³ pleasure rating; *Kendall's tau* = .117, $p = .564 > .05$. It is not clear what these results mean. It may possibly indicate that Limelight can elicit an emotional reaction from visitors regardless of how much they like being in front of a crowd. It may also indicate problems using these measures to assess emotions and/or comfort with public speaking.

What did visitors think was the point of the exhibit?

Visitors thought that the point of the exhibit was

- To show them how their emotions are influenced by how others respond to them (9/19)
- To provide visitors the experience of being in front of a large audience (8/19)
- To show people that how people react to them depends on the way they speak (1/19)
- One visitor did not know what the point was.

Was the exhibit experience worthwhile?

Most visitors thought their experience inside Limelight was a worthwhile experience.

	Count (out of 19)
Worthwhile	10
Somewhat Worthwhile	4
Neutral	4
Somewhat Not Worthwhile	0
Not Worthwhile	1

Visitors thought the experience was *worthwhile* or *somewhat worthwhile* because

- it simulates being on stage without the risks (6/19)

² Their derived arousal ratings were obtained by finding the corresponding arousal rating for each visitor's word according to the Russell and Mehrabian (1977) study. Note that when a visitor reported that they *like* or *dislike* being in front of a crowd, we considered that high excitement; *somewhat like* and *somewhat dislike* were considered medium excitement, and *does not affect me* is considered low excitement.

³ Their derived pleasure ratings were obtained by finding the corresponding arousal rating for each visitor's word according to the Russell and Mehrabian (1977) study.

- it made them think about the connection between their emotions and peoples' reactions (4/19)
- the sounds (i.e., feedback) inside the exhibit were engaging (3/19)
- it was the only place you can be alone in the museum (1/19)

Alternatively, visitors thought that the experience was not as worthwhile because

- The exhibit did not evoke any strong emotions or reactions (3/19)
- There was not enough things to physically manipulate or control (1/19)
- They didn't see the point of the exhibit (1/19)
- The audience simulation did not feel real (1/19)

Visitors made suggestions for making the experience more worthwhile to them:

- Make the audience seem more real by adding a video of crowd reactions (4/14). For example,
 - Visitor2: Show a video so that we can see the people, see their reactions, see them throwing tomatoes at us.
 - Visitor9: Have a screen to see the crowd so you can feel like you're in front of the crowd.
- Otherwise, make the simulation more convincing (3/14) with the following:
 - Visitor7: Perhaps have a podium to step up on, to be asked to say something about yourself, to be asked to sing,
 - Visitor12: Program to make it respond more appropriately to what you say. Like when you say hello, it doesn't make sense for it to boo you.
 - Visitor18: Have an incline or decline before you walked to simulate going on stage. The incline especially would be like coming out onto the audience. Have some cloth curtains, corridors to the stage.
- Clearly explain what the exhibit is about (2/14)
- Add a door to provide more privacy (2/14).
- Clearly indicate that the exhibit is occupied (1/14)
- Have more than one to shorten the waiting time (1/14)
- Allow only one person in at a time (1/14)
- Allow more than one person in at a time (1/14)
- Raise the height of the microphone for adults (1/14)
- Have combinations of positive and negative sounds in a reaction (1/14). That is;

Visitor11: Mix different reactions. So mix the yays and the boos. That way people would know how it feels to be just booed, just yayed, and the combination of booing and yaying. It's better to have all combinations.

SUMMARY

The findings suggest that **we should find better ways of encouraging visitors to use the exhibit individually**. 12/19 of the visitors we observed entered the exhibit with someone else. However, when asked, a small majority (11/19) said that they preferred to have used the exhibit alone⁴ because being alone would better resemble being on stage and because privacy was important to their exhibit experience. Although there is currently a sign outside the prototype instructing visitors to enter one at a time, this sign is not completely effective. This may be because the sign is small, is obscured when crowded, and/or is too high for the younger children.

We recommend that the next iteration **more clearly indicate when the exhibit is occupied**. We found that 7 out of 19 (37%) visitors we observed entered the exhibit when someone else was already in Limelight. And, a few (3/8) of the visitors, who were interrupted, reported feeling uncomfortable and self-conscious when someone else stepped inside. However, **we do not think it is necessary to physically bar people from stepping in when Limelight is occupied**. In a majority of cases (5/8), visitors were not bothered by the interruption because they knew the person who was stepping in. Alternatively, none of the people who stepped in while the exhibit was occupied were put off by what they saw or heard.

Twelve out of 16 (75%) of the visitors we interviewed reported having some kind of emotional reaction to the cheers and jeers of the simulated audience. However, one quarter of the visitors reported not feeling much of anything. This may be because some visitors are used to being in front of crowds.⁵ Alternatively, the exhibit may not provide a convincing enough experience.⁶ As one person explained:

Visitor8: I knew that it wasn't real. Because I know I'm not really on a stage and there isn't an audience out there.

⁴ 5/19 did not give a preference, and 3/19 visitors preferred to use the exhibit with someone else.

⁵ However, we could not find any correlation between comfort in front of a crowd and how pleasant or how arousing the exhibit experience was.

⁶ We note that about half (9/19) of the visitors reported that they did not feel that they were standing inside a large auditorium

We may want to **invest additional effort into making the stage experience more believable**. Encouraging visitors to 'step on stage' alone and discouraging interruptions may help in this regard.

About half of the people interviewed thought that Limelight showed how their emotions can be influenced by how others respond to them. However, 8/19 (42%) thought the exhibit was meant to simulate being in front of a crowd on stage. That is, their focus remained on the experience and not on the emotions that accompanied that experience. In addition to the voice that prompts people to reflect on their emotions, we may also want to **experiment with other way of facilitating self-reflection**, for example by allowing visitors to talk or write about their feelings from their time in the Limelight.

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APPENDIX A

Observations

Observe and interview individuals. Pick every 3rd person who enters and stays for more than 10 seconds. Do not observe/interview anyone under 8.

Note anything of interest. In particular:

1. Time visitor entered _____
2. How many other people were in there concurrently _____
3. Did the lights go on? YES NO
4. Time visitor exited _____
5. Expression on face while coming out
6. Other observations

Questions

1. Can you tell me what happened inside the exhibit?
 - a. Can you remember what sounds you heard?
 - b. Did you talk into the microphone inside the exhibit? It's okay if you didn't. YES NO
- [If they were the first inside]
- c. Did anyone come into the exhibit after you were already inside? YES NO

[If YES]

- i. Did that make your experience...

Better	Worse	About the same
--------	-------	----------------

 ... compared to if no one had come in?

[If they came in after the experience had already started for someone else inside]

- d. Was someone already in the exhibit when you went inside? YES NO

[If YES]

- i. Did knowing what would happen inside the exhibit make you want to try it for yourself less or more than if you had not known? Or did it not make a difference?
- More Less No Difference
2. How large did the space *feel to* you? This is not necessarily how large you know it is looking from the outside, but how it felt. [pause] So, did it feel like a large auditorium, a large bedroom, a small closet ...
3. Did you use the exhibit alone or with other people? ALONE W/ OTHERS
- a. Would you have preferred to use it alone or with other people? ALONE W/ OTHERS
- b. Why's that?
4. Can you describe how you felt inside the exhibit? [What emotions did you feel?]
5. So...would you say it felt
- | | | | | |
|------------|---------------------|---------|-------------------|----------|
| Unpleasant | Somewhat Unpleasant | Neutral | Somewhat Pleasant | Pleasant |
|------------|---------------------|---------|-------------------|----------|
6. Would you say you felt
- | | | | | |
|------|---------------|---------|------------------|---------|
| Calm | Somewhat Calm | Neutral | Somewhat Excited | Excited |
|------|---------------|---------|------------------|---------|
7. In general, do you
- | | | | | |
|---|--|--------------------------------------|---|--|
| like being in front of a large crowd | somewhat like being in front of a large crowd | large crowds don't affect you | somewhat dislike being in front of a large crowd | dislike being in front of a large crowd |
|---|--|--------------------------------------|---|--|
8. What do you think the point of the exhibit? Did it even have a point?
9. Overall, did you find your experience in that exhibit ...
- | | | | | |
|----------------|-------------------------|---------|---------------------|------------|
| Not Worthwhile | Somewhat Not Worthwhile | Neutral | Somewhat Worthwhile | Worthwhile |
|----------------|-------------------------|---------|---------------------|------------|
10. What made it _____ for you?
11. Is there anything we can do to make the experience more worthwhile for you?