

Rack Your Brain on the Mind Online Interactive Kiosk

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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

Mind – Formative Rack Your Brain on the Mind Online Interactive Kiosk

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PURPOSE

Rack Your Brain is a multimedia interactive activity based on a psychological experiment conducted by Kahneman and Tversky on judgment and availability: the ease by which something is brought to mind

In *Rack Your Brain*, visitors are randomly assigned to one of 2 conditions; they are asked to give either 3 or 12 reasons for liking something of their choosing; the interactive suggests some topics for their consideration (e.g. school, work). While listing their reasons, visitors are not aware that there are 2 conditions; that some visitors are asked to give 3 reasons while others are asked to give 12. After giving their reasons, visitors rate how they like the item that they just gave reasons for liking. In the original experiment, the researchers found that subjects who were asked to give 3 reasons rated their item higher (i.e., they liked the item more) than subjects who were asked to give 12 reasons. In *Rack Your Brain*, visitors can see the two groups' (3 or 12 reasons) ratings on the *Debrief* page and go on to read what these results might say about the human mind on the *About the Human Mind* page.

This formative evaluation looks at

- What did visitors do in *Rack Your Brain*, particularly what pages did they visit?
- Did they find the activity interesting?
- What visitors thought the activity was about, or what, if anything, did it show them?
- What did they find confusing?

METHOD

Rack Your Brain was one of four activities that were available for visitors to use on the Mind Online Interactive Kiosk (MOIK). (The others were *Random Patterns*, *Emotional Expressions*, and *Life Changing Dreams*.) The first page showed all four activities, and visitors could select among the four. (See Figure 1.)

The MOIK was placed in the Philosopher's Corner in the Mind Section. An evaluator sat close to the MOIK and observed which activity a visitor used and noted the demographic

information for that visitor. If the visitor chose either *Rack Your Brain* or *Emotional Expressions*¹, the evaluator would approach that visitor² after s/he had finished using the MOIK to ask for an interview. The interview questions can be found in the appendix of this report.

Figure 1. Mind Online Interactive Kiosk (MOIK) in the Philosopher's Corner



¹ We had planned to collect interview data for a formative study on Emotional Expressions. However, we only managed to interview 2 visitors for that activity. Those results are not included in this report.

² We only approached visitors 8-years old or older.

In addition, the MOIK logged click stream data that we coordinated with our observations to determine which activities each visitor chose and how long s/he spent on each page of each activity.

DATA COLLECTED

We collected data on Saturday, May 20, 2006 and Memorial Day, May 29, 2006.

Observations

- $N = 21$. This includes visitors who did not use *Rack Your Brain*.

Age Group	Count (out of 21)
Adult	13
Teen	4
Child	3
Under 8	1

Gender	Count (out of 21)
Female	10
Male	11

Group Type	Count (out of 21)
Adult peer group	5
Multigenerational group	14
Individual adults	1
Individual teen	1

Interviews

- $N = 12$. This includes ONLY the visitors who were interviewed for *Rack Your Brain*.

Age Group	Count (out of 12)
Adult	8
Teen	2
Child	2

Gender	Count (out of 12)
Female	6
Male	6

Group Type	Count (out of 12)
Adult peer group	3
Multigenerational group	8
Individual adults	1

RESULTS

What visitors did

Table 1 lists the number of visitors we observed who tried each of the four activities that were offered.

Table 1. Activities Visitors Tried

Activity	Number of Visitors (out of 21)
Rack Your Brain	18
Emotional Expressions	6
Life-Changing Dream	5
Random Patterns	12

We asked visitors why they chose *Rack Your Brain*. They answered

- Something about the link looked interesting (2 out of 12)
 - Visitor1: I just wanted to try Rack Your Brain. The title intrigued me.
 - Visitor8: I thought it was going to be a challenge, to find out how my mind works.
- The activity was already on the screen (2 out of 12)
 - Visitor6: It was already on, and I was also attracted by the PC. I guess I didn't realize that there were other activities.
 - Visitor10: It was already on there - I think I picked start over rather than main menu.

However, most (7 out of 12) visitors gave no reason for choosing *Rack Your Brain*. Visitors may simply be picking *Rack Your Brain* because it's the first item, appearing in the upper left, of the four choices.

Table 2 shows the number of visits for each page of each activity. This information is represented again in Figure 2. For *Rack Your Brain*, note that a majority of the visitors went through the entire sequence of pages, from Start, where they chose which item to list reasons for liking, all the way to the *About the Human Mind* page.

Table 2. Media Pages for Each Activity

Media Page	Number of Visits
KioskHomePage	17
LifeChangingDream	5
MixandMatchEmotions	
Start	8
More	3
RackYourBrain	
Start	14
EnterReasons	16
Rate	15
Debrief (shows the 2 groups' ratings)	15
About Human Mind (explains what the experiment is meant to show)	10
RandomBlocks	12

Figure 2. Pages Visited and Visitors' Paths. A box represents a page. The brightness of a box indicates the number of visits that page received. The thickness of a line between 2 boxes indicates the number of times visitors jumped between those 2 pages.

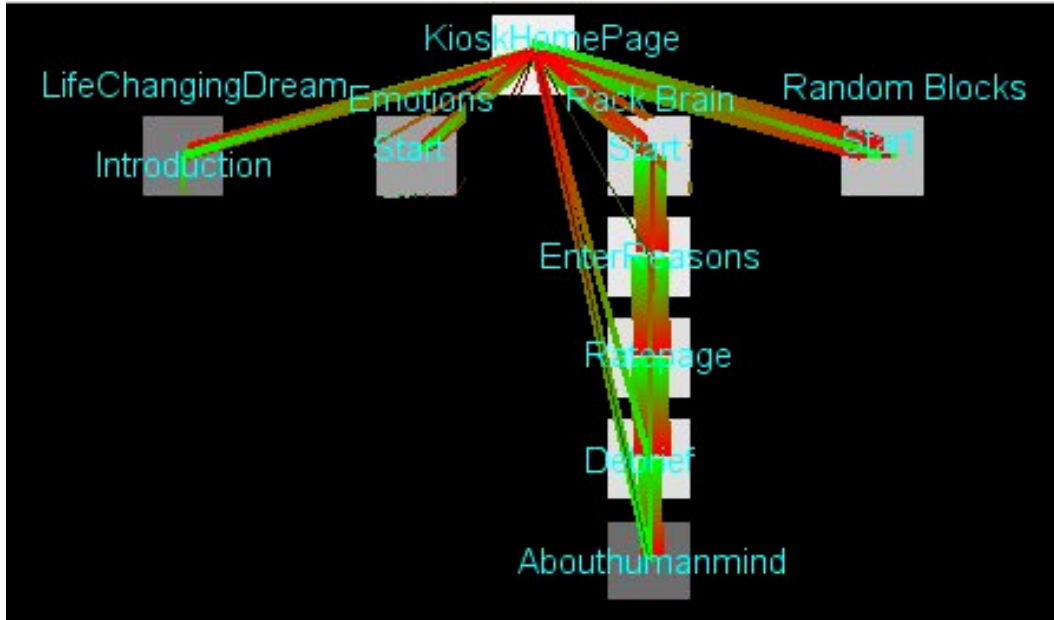


Table 3 shows the holding times for each *Rack Your Brain* page. These data show that visitors spent the greatest percentage of their time considering and entering their reasons, and the least amount of time rating how much they liked the item after giving these reasons.

Table 3. Holding Time For Each Page

Media Page	Count (out of 21 visitors)	Median dwell time	Max dwell time	Average dwell time
RackYourBrain				
Start	14	4.5	19	4
Enter Reasons	16	82.5	216	94
Rate	15	11	118	16
Debrief (shows each group's mean rating)	15	26	56	30
About Human Mind (explains what the results reveal about the human mind)	10	20	77	27

In fact, 10 of the 12 visitors we interviewed typed in all their reasons. (Table 4 shows the number of visitors who were asked to list 3 reasons and the number asked to list 12.) The two who did not complete their list, were asked to give 12 reasons but could not come up with all 12. Nonetheless, they did type in as many as came to mind.

Table 4. Condition Groups

Condition Group	Count (out of 12)
List 3 reasons	7
List 12 reasons	5

This suggests that visitors take the time to deliberate on the reasons they give. But, it is not clear how much thought they give to the likeability rating that they give.

Visitor Interest

On average, visitors who stopped and looked at *Rack Your Brain* thought the activity was *Neutral* (neither interesting nor not interesting) to *Somewhat Interesting*.

Interest Rating	Count (out of 12)
Interesting	0
Somewhat interesting	6
Neutral	2
Somewhat not interesting	3
Not interesting	1

Visitors found the activity interesting because

- They could compare their answers to other answers. However, it is not clear what some visitors thought they were comparing (3/12).

Visitor1: Just the comparison of how it was about even for the people who listed 3 as those who listed 12.

Visitor7: Just the comparison to a random sample group.

Visitor11: M: I kinda liked being able to compare my answer to others. And that we're responding on the easiest answers, it's cool seeing where I stand. It's also interesting that all of our brains work the same, but it wasn't earth shattering.

- They found it challenging to thinking up the reasons (1/12).
- They were interested figuring out what the activity was about (1/12).

Alternatively, other visitors thought the activity was *not* interesting because

- They did not understand what it was about (3/12).
- The results weren't interesting (1/12).
- There was too much to read (1/12).

Comprehension

What visitors thought the activity was trying to show

We suspected that the relationship between availability and judgment may be difficult for visitors to grasp in this activity and sought to gauge what visitors thought the activity was supposed to show.

When asked, visitors said they thought the activity

- didn't have a point (5/12).
- demonstrates something about the human mind and research. Yet, these same visitors did not give any further details (4/12). It is, therefore, not clear if these visitors understood the point of the activity.
- shows that listing 12 or listing 3 reasons is somehow different (2/12). One of these visitors seemed to describe availability:
 - Visitor1: I'm guessing that by listing 12, I started to repeat things, and by listing only 3, you just get it out - exactly what's the most important to you.
- is supposed to analyze the specific reasons a visitor entered (2/12). This is not what *Rack Your Brain* does, and visitors were surprised and disappointed.
 - Visitor8: It didn't explain how my responses fit in to what other people said
 - Visitor7: I thought it was going to give me a profile rather than just say how many answers I put down.
- shows that listing 12 is similar to listing 3 reasons (1/12).

We also asked visitors what the activity reminded them of to gauge what, if anything, they associated the activity with in their own lives. Visitors mentioned:

- Taking tests (3/12)
- The specific item they chose to give reasons for liking (e.g. work, school) (2/12)
- Computers (1/12)
- Half (6/12) of the visitors said that it did not remind them of anything.

No one mentioned any examples of availability, the cognitive concept that the experience was intended to demonstrate.

Finally, we asked if they discovered anything about themselves through the activity. Visitors answered:

- It's hard to list so many reasons (2/12)
- My reasons are different from my companion's (1/12)

Most (8/12) visitors felt that they did not discover anything new about themselves.

Points of Confusion

The above data suggest that few visitors grasped the concept of availability and its relationship to judgment. To try to identify what may be problematic with the current activity, we looked in particular at 3 parts of *Rack Your Brain*:

- the instructions for what to do,
- the *Debrief* page, where visitors could look at the summary likeability rating for visitors who were asked to give 3 reasons versus 12 reasons, and
- the *About the Human Mind* page, which explains the purpose of the experiment and what it reveals about the human mind.

Instructions for what to do.

Most visitors knew what to do in *Rack Your Brain*. However, two people mentioned navigation issues:

Visitor6: Once we were done there was a little box to hit to get to the explanation screen. I didn't see that the first time.

Visitor8: In the main menu - I didn't know what the selections were for.

As reported earlier, visitors spent time thinking and entering their reasons; they tried to come up with all 3 or all 12.

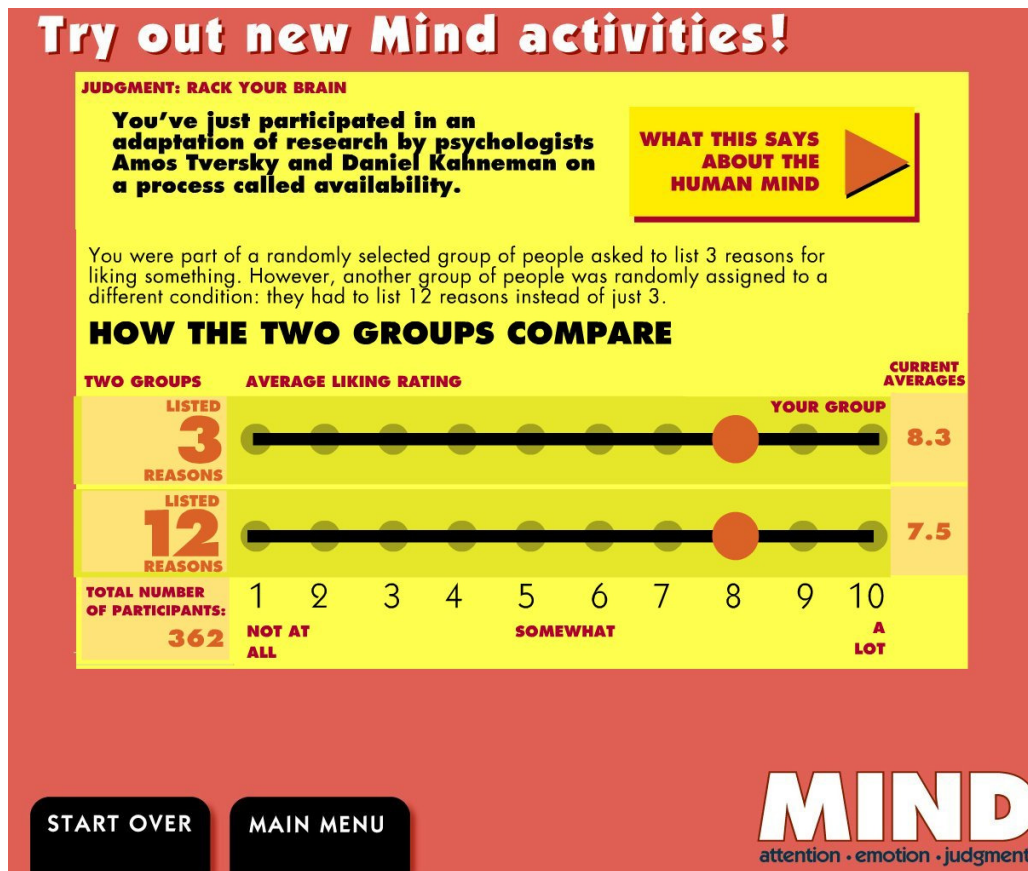
Debrief Page - Interpreting the Results.

All 12 visitors whom we interviewed reached the *Debrief* page (Figure 3). However, a majority (7 /12) of the visitors could not or did not try to make sense of the information on this screen. For example,

Visitor7: It looked like too much to understand.

Visitor8: I don't know what they're saying. Who are the two groups anyway?

Figure 3. Debrief Page for Rack Your Brain on MOIK



Three visitors understood that there were 2 different groups. However, to them, the results indicated that the 2 groups are similar, contrary to the original experiment's findings.

Visitor1: It shows that 3 and 12 are about even...when you list 12 you have to list more, but not necessarily get any more information, or list anything important.

Visitor6: I don't know. There wasn't very much variation between the groups that put 3 reasons (my son was one of those) and the people who put 12 (like me). Just not very much statistical variation.

Visitor11: It's kinda interesting that 12 had almost no difference.

Otherwise, 2 (out of 12) visitors understood that this screen somehow showed other people's results, but they were not sure how.

When we further asked what was confusing about this page, visitors explained:

- There was too much information on the page (4 visitors)
- They had trouble seeing the connection between the reasons they gave and the results shown (3 visitors)

Visitor4: It's not clear what THESE results had to do with what I did. I only did one part - but it talks about another group. Who are they?

Visitor6: It would be clearer if it said "Respondents who answered 3" rather than just "listed 3 reasons"

Visitor8: I don't understand this at all. We just couldn't figure it out - what it was saying or why it looked like that, what it did with our data.

About the Human Mind Page – Explaining what the experiment was meant to show about the mind

8/12 visitors reached the final page (Figure 4) that explained the purpose of the experiment and what it should show about to the human mind. However, only 2 visitors took the time to read the text. These 2 visitors said that they had some difficulty with the page:

Visitor6: I was able to understand it, but didn't really get what it was saying until the 2nd paragraph. This would work better if the conclusion is up at the top and very obvious, to have the big idea up there. Then explain it after.

Visitor11: I didn't understand what they were saying - I understood the convenience they talk about in the top half - but don't understand how it applies to THIS other screen (results screen).

Figure 4. About the Human Mind Page for Rack Your Brain on the MOIK

Try out new Mind activities!

JUDGMENT: RACK YOUR BRAIN

WHAT'S GOING ON?

Availability refers to the ease with which you can bring something to mind. For example, if asked for your mother's name, you'd bring it to mind quickly—it would be highly available. But your kindergarten teacher's name would probably not be as available, so you might have to struggle to recall it. We often use availability as an indicator of commonness. If asked to name a kind of dessert, "chocolate cake" might be a highly available answer—and indeed, you're more likely to see it on restaurant menus than other desserts.

Here, it might seem that people giving 12 reasons for liking something would like it more than people giving 3—they gave more reasons, right? But 3 reasons come to mind easily, whereas reasons 10, 11, and 12 may be hard to come up with. Without being aware of it, that feeling of reduced availability can affect the liking judgment: "Hmmm. Those reasons were tough to think of. I may not like X as much as I thought."

GO BACK

START OVER **MAIN MENU**

MIND
attention · emotion · judgment

Suggestions for Improvement

Visitors gave the following suggestions for improving the current version of *Rack Your Brain*.

- In general
 - Visitor8: Too hard for kids. Too wordy... What it [the point] is. I'm attracted to it saying it's about my mind. So I thought I'd suspend disbelief and follow the instructions, but it never got clearer than that.
 - Visitor4: Maybe less lengthy explanations. Pictures or better charts might help too.
 - Visitor7: I guess it should say "Please read carefully" or maybe "Ask the detail-oriented people to explain it to you."
- More specifically
 - Orientation

Visitor7: The very first screen didn't set out the point of the activity very well. That would be helpful.

– *Debrief Page*

Visitor6: It would be clearer if it said "Respondents who answered 3" rather than just "listed 3 reasons" This is really the challenge of technical writing - to help people get into the meaning quickly. It took me a moment to focus on what it meant, which I find to be true at lots of exhibits here. Good technical writing needs really good diagrams and punched up text.

– *About the Human Mind Page*

Visitor6: I was able to understand it, but didn't really get what it was saying until the 2nd paragraph. This would work better if the conclusion is up at the top and very obvious, to have the big idea up there. Then explain it after

SUMMARY

Although visitors conscientiously followed the instructions for *Rack Your Brain*, thinking about and listing their reasons, they, nonetheless, had trouble connecting what they did with the concept that the experiment was intended to show. In fact, it was not clear if *anyone* understood availability and how that affects judgment.

There may be several reasons for this:

- Because visitors spent the majority of their time (and possibly mental effort) coming up with reasons for liking something, some visitors, consequently, expected the subsequent pages to refer back to the reasons they gave (e.g. why they like their work). That is, they expected to see the *reasons* they gave for liking something and not their *rating* for liking that something, and they expected the subsequent pages to interpret the reasons they typed not the ratings they chose.
- Some visitors did not seem to know that there were two groups and that they were assigned to one of the two groups that were being compared. These visitors were, therefore, confused by the *Debrief* page and all subsequent pages.
- The *Debrief* page was hard for some visitors to interpret because of the above two sources of confusion. In addition, one visitor mentioned that there was too much information on the page.
- There was no clear difference for the data collected for the 2 groups. Thus, the data did not support the conclusion.
- By the time visitors got to the *About the Human Mind* page, most of them did not bother to read it in any detail. Some of these visitors complained that it looked too 'wordy.' Of the two visitors who did read the page in detail, both had difficulties understanding the explanation.

These challenges reflect issues that arise for any exhibit that tries to adapt a psychology experiment for visitors on our floor. Broadly, these issues are:

- How can we collect ‘good’ data (i.e., thoughtful responses and on-task behavior)?
- How can we help visitors interpret their individual and collective responses? That is, how do we help visitors
 - connect their individual input to the larger group’s data,
 - realize that the exhibit, in fact, randomly assigned different visitors to different groups with different experiences, and
 - compare and interpret data across different groups.
- What do we do if the data does not support the original findings of the experiment we are adapting?
- Finally, how do we connect a very concrete experience to a more general explanation of the workings of mind?

The current version of *Rack Your Brain* seems to address the first issue well but needs to revisit the other issues. Evaluation of future iterations of *Rack Your Brain* and similar exhibits will look specifically at these challenges to assess approaches and identify helpful guidelines for development.

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APPENDIX A

1. Which activities did you try?

Rack Your Brain	How are Emotional Expressions Built	Tell Us about a Life-Changing Dream	Random Patterns
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2. Can you describe what you did in that activity?

3. Is there any reason why you chose that activity to try?

[Pick one to talk about/ cycle between Rack Your Brain and Emotional Expressions]

Questions for Rack your Brain

So, thinking only about that one activity...

4. How interesting would you say that was? Would you say that was ...

Uninteresting	Somewhat Uninteresting	Neutral	Somewhat Interesting	Interesting
1	2	3	4	5

5. What made it _____ for you?

6. Was there anything confusing about that activity? [Anything else? Anything else that was confusing?]

7. What do you think was the point of the activity? Does it even have a point?

8. Did the activity remind you of anything in your own life? **YES** **NO**

a. *[if YES]* What does it remind you of?

9. Did you find out anything new about yourself from doing this activity? What?

Again thinking only about this one activity. Do you remember:

10. How many reasons did it ask you to come up with?

11. Did you type in all those reasons? **YES** **NO**
- a. [If NO] Did you think them in your head instead? **YES** **NO**
- b. How many reasons did you think of in your head?
12. Did you get to this screen? [Show screenshot of Debrief Page] **YES**
NO
- a. What, if anything, did this show you?
- b. [If Something] Was that interesting for you? How so?/Why not?
- c. We think this screen can be a little confusing and we're trying to improve it. Was there anything confusing about this screen for you?
13. Did you get to this screen? [Show text page] **YES** **NO**
- [If YES]
- a. Did you get a chance to read it? **YES** **NO**
- b. We're trying to make this better. Was there anything that was confusing about what this was trying to say?
14. Do you have any suggestions for improving this particular activity?