

Visitors' Preconceptions about Thinking and Feeling

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Mind and Learning - Front-End Evaluation

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PURPOSE

The Mind and Learning team was interested in exploring "Thinking and Feeling" as a theme that unifies the first set of exhibits and programs for the new Mind and Learning section being planned at the Exploratorium. The team suspected that visitors may hold a false dichotomy between the processes: thinking and feeling, in which case one of the foci of the new section would be to elucidate the connection between thinking and feeling.

This front-end study was conducted to gauge visitors' preconceptions about thinking and feeling. Specifically, this study was conducted to determine

1. what visitors think about when they hear the words 'thinking' and 'feeling',
2. if, and to what extent, they believe that thinking and feeling are different and similar,
3. and what visitors believe 'thinking' and 'feeling' entail.

Findings from this study may be used to inform the design of exhibits and programs for the new section.

METHODS

Visitors were recruited on the mezzanine of the Exploratorium, between the Sound/Hearing and the Electricity/Magnetism sections and between the Traits of Life and the Sound/Hearing sections. From past experiences, we've found that the mezzanine provides a more reflective area to conduct interviews about the nature of the mind.

Visitors, ages 13 and over, were recruited systematically either as individuals or as pairs.

Each visitor or visitor pair was asked 4 questions:

1. What comes to mind when you hear the word 'thinking'?
2. What come to mind when you hear the word 'feeling'?
3. In your opinion, is there a difference between thinking and feeling? What do you think that difference is?
4. In your opinion, are thinking and feeling similar in any way? How so?

This was then followed by a sorting task in which visitors were given words (Table 1) printed on post-it notes and asked to place each word in one of 4 categories:

Feeling – more to do with feeling than with thinking

Thinking – more to do with thinking than feeling

Both Feeling and Thinking (Equally) – both thinking and feeling, equally

Neither – nothing to do with either feeling or thinking

Visitors were encouraged to explain their placement, although due to the length of this interview, visitors would sometimes lapse into silence. In these cases, the interviewer would prompt the visitor after the sorting task to explain why they placed certain words: *Art, Consciousness, Creative, Decision-Making, Intelligence, Knowing, Men, Problem-Solving, Science, Women, and Words*, where they did.

Before the interviews, the Mind and Learning Team reviewed the list to make sure that the words to be sorted represented concepts that they wanted to explore under 'Thinking and Feeling.'

Table 1. Word configuration before sorting. Note that the post-its were always placed in the same configuration and then presented to visitors for sorting.

Walking	Reason	Machine
Decision-Making	Dark	Human
Men	Light	Art
Women	Consciousness	Science
Intelligence	Pictures	Mind
Creative	Numbers	Body
Child	Words	Knowing
Adult	Dancing	Coffee
Problem-Solving	Intuition	Comedy
Beauty	Logical	Memory

Data Collected

In total, 34 interviews were conducted between 5/28/02 and 6/13/02 during the afternoons.

Date	Day
May 28	Tuesday
June 2	Sunday
June 6	Thursday
June 11	Thursday
June 12	Wednesday
June 13	Thursday

The visitors interviewed were mostly adults

Adult	27 (79%)
Teen	7 (21%)

Most interviews were conducted with individual visitors

Individual	25 (74%)
Pair	9 (26%)

RESULTS

In the following, the interviewed group (i.e., the individual in an one-on-one interview or the pair in a group interview) is the unit of analysis.

What is thinking and what is feeling?

Thinking

When visitors were asked what came to mind when they hear the word 'thinking,' visitors mentioned:

Brain	20 (59%)
Mind	6 (18%)
School, education	6 (18%)
Ideas, thought	5 (15%)

Feeling

When visitors were asked what came to mind when they hear the word 'feeling,' visitors answered:

Senses, Touch, Skin	20 (59%)
Emotions	14 (41%)

Note that 'feeling' is not only associated with emotions but also with tactile sensation.

Differences

Most visitors (94% of 34) believed that there is a difference between thinking and feeling. Table 2 lists the differences visitors described.

Table 2. The difference between thinking and feeling

Thinking		Feeling
Involves the head	vs	Involves the heart
Thought	vs	Sentiment
Intellect	vs	Emotions
Is intentional	vs	Is not intentional (it just happens)
Is an action or a process	vs	Is a state-of-being
Involves figuring something out	vs	Is simply knowing (or intuition)
Is rational or logical	vs	Is an instinct
Is a (conscious) process	vs	Is a reaction
Is controlled	vs	Is not controlled
Is not biased	vs	Is personal and biased
Is based on facts	vs	Is based on (personal) experience

Similarities

Most visitors (82% of 34) also believed that there is some connection between thinking and feeling, although few could articulate the nature of the connection. The following lists the similarities or the connections they believe exist between thinking and feeling.

- Affects one another
- Both use the brain
- Thinking causes feelings
- Feelings lead to thinking
- Both needed to help find solutions
- They're the same thing
- We're aware of them

What involves thinking and feeling, and to what extent?

The results of the sorting task are shown in Figure 1. The chart shows the percentage of visitors who believed that the concept involved *Thinking* and the percentage of visitors who believed that the concept involved *Feeling*. Note that if a visitor sorted the concept as *Both* thinking and feeling, that count was divided equally between *Feeling* and *Thinking* (i.e. counted as 1/2 *Feeling* and 1/2 *Thinking*). The percentages are calculated from the total number of visitor groups who sorted the concept in *Feeling*, *Thinking*, or *Both*; it does not include those visitors who placed it under the *Neither* category. See Table 3.

Figure 1. Percentage of visitors who sorted the words into the *Thinking* and into the *Feeling* categories. Note that the above table does not include data for *coffee*, a word that a large majority of visitors believed belonged in neither *Thinking* nor *Feeling*.

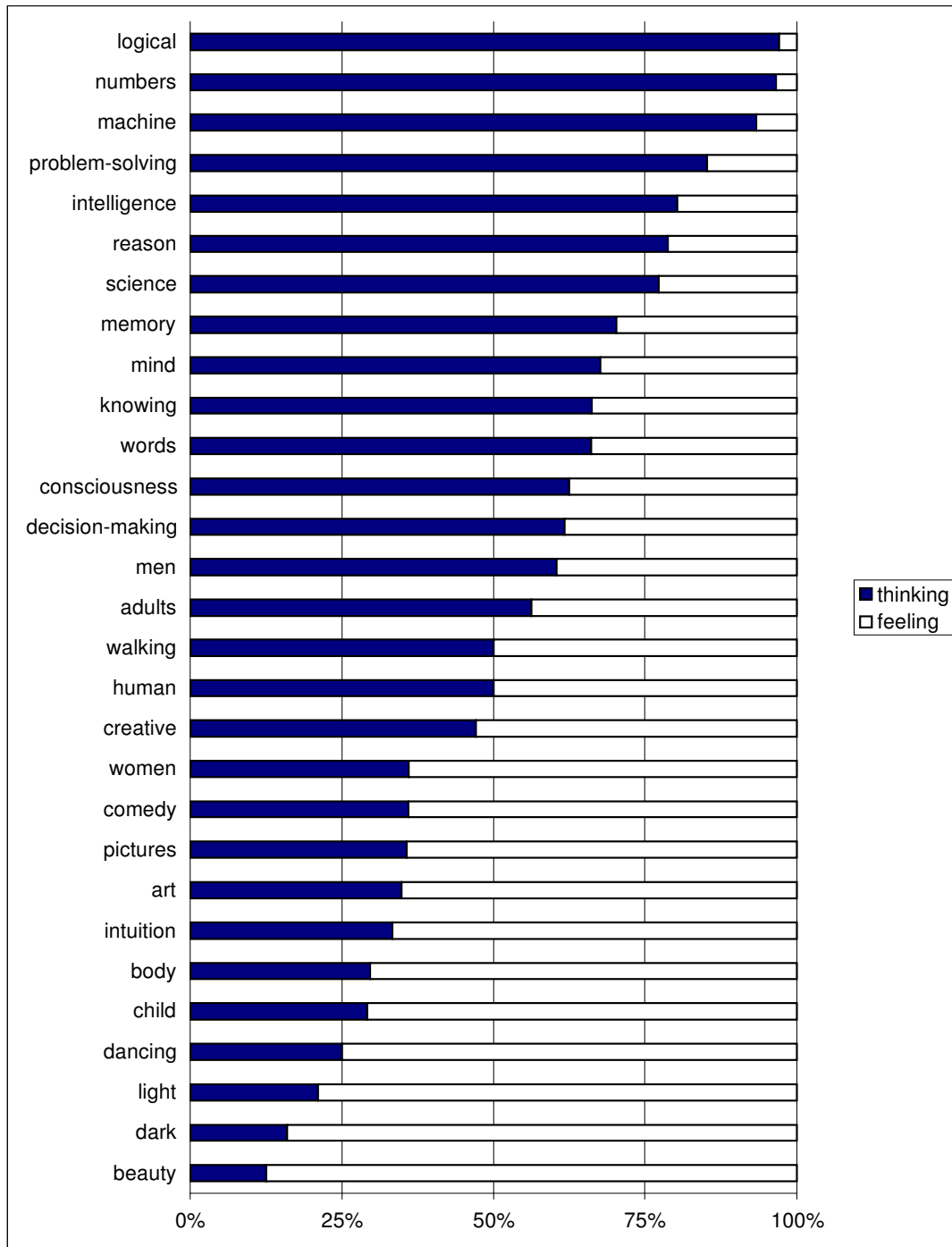


Table 3. Tally for each of the 4 categories

	<i>Feeling</i>	<i>Both</i>	<i>Thinking</i>	<i>Neither</i>
Adults	2	17	5	10
Art	12	19	2	1
Beauty	22	5	1	5
Body	12	14	1	7
Child	11	12	1	10
Coffee	7	2	0	25
Comedy	13	15	4	2
Consciousness	5	14	13	2
Creative	5	26	3	0
Dancing	15	15	0	4
Dark	16	5	1	12
Decision	4	18	12	0
Human	0	29	0	5
Intelligence	0	13	20	1
Intuition	15	14	4	1
Knowing	3	17	14	0
Light	13	4	2	14
Logical	0	2	32	0
Machine	1	0	14	19
Memory	1	17	14	2
Men	2	15	7	10
Mind	0	22	12	0
Numbers	1	0	28	5
Pictures	11	14	3	6
Problem	1	8	25	0
Reason	2	10	21	1
Science	1	13	19	1
Walking	8	8	8	10
Women	7	18	0	9
Words	3	15	13	3

Visitors' Comments

The following are some of the explanations visitors gave during the sorting task. They are provided here to give a sense for some of the rationale behind visitors' categorization but are not meant to be an exhaustive listing.

	<i>Feeling</i>	<i>Both</i>	<i>Thinking</i>
Adults		You do both	Opposite of a child
Art	A lot of artists have emotions when they do their drawings and things. They feel.	Artists feel to paint picture, but think how to do it	Freedom of thinking enables one to do art
Beauty	Yourself and what you see give a good or bad feeling	It's determined both by what society makes you think as well as by feelings.	What you think beauty is, it's all in your mind
Body	You feel your feelings with the body	Western medicine is thinking, eastern is more about feeling, so I'll go with both	The body knows what is going on from your brain
Child	Kids feel a lot - decide actions with their feelings		
Comedy	It's an emotion if its funny It makes you happy	Think about it to understand it and get a feeling from it	
Consciousness	If you're unconscious, you're not feeling anything, no emotions. Something apart from our physical being	Don't feel or think about it, it just is, you just are You think and feel when you're conscious.	It's awareness, being aware, and doesn't require feeling. I pictured being awake, having the brain on, and thinking.
Creative	A lot of your creative ability comes from feeling. Less from your logical process, and more from you're sensory process.	You think and feel. Feelings tell you what you want. You can't be creative only on a feeling basis, even though some people think that's how it works. Like they'll take drugs because they think it makes them more creative and then they make something, and come back to it later, and it doesn't make any sense,	You think when you are being creative

	<i>Feeling</i>	<i>Both</i>	<i>Thinking</i>
		it's not anything.	
Dancing	More of an artistic action	In an earlier time, with steps, you might have had to think about it. But It's fun, so it's feeling.	
Dark	Some people are scared of the dark		
Decision-Making	The bottom line is that people make decisions based on how they feel, if they're open to it. Thinking comes into play, but the actual decision usually comes down to, "How does it feel?"	Thinking because it's logical and deductive, but instinct often guides them as well. Use your brain to make decisions but also how you feel about what you want	I try to make decisions by removing emotions as much as possible, by thinking and not being reactive
Human		[Thinking and feeling] defines human beings	
Intelli-gence		Both emotionally and mentally intelligent. There are a lot of different forms of intelligence. It takes both sides.	You think with your intelligence
Intuition	An inner feeling	Comes from within, but you think about it. Getting a sense of things from experience and from just how you feel.	You follow what you think
Knowing	You feel something is right - to feel with conviction	You think what's right, feel it through your body Knowing someone is more associated with feeling. Knowing how to repair a car, for example, is more thinking.	Knowing how to do something requires thought. Because it's all about having information, experience, education.
Light	Makes you feel things		Think more during the day
Logical			[There's] scientific reasons behind it
Memory		Both thoughts and feelings evoke memory.	You remember a memory and think about it
Men	I think as opposed to	People are surely both.	Men tend towards thinking

	<i>Feeling</i>	<i>Both</i>	<i>Thinking</i>
	children, life has more depth at that point for men and women, and feeling dominates them more than thinking.		more; more logically, less emotionally I think on the whole, women have more equipment to make them more in touch with their feelings. I teach art and talk to my students about how the mind works, and you know they just found that women have equal transfer of electrodes whereas in men, they only go one way. So that has something to do with it. Also, men pride themselves on their thinking, you know?
Mind		Does thinking and feeling	
Numbers	You take them in, you don't think in numbers.		More logical
Pictures		Feeling side, but then you need your brain to interpret the picture.	
Problem-Solving		Think through problems, but can be emotional about it too	It's about logic and deduction. Evaluating a situation with what knowledge you have. I thought of math.
Reason		There is an emotional aspect to it	You use your brain to reason
Science		Need to use both-academic rationale and feeling about what's going on	You use your mind More about reasoning and deduction. Scientists can't really get away with "This is so because I have a gut feeling about it..." As Richard Feynman said, "Science is what we do to avoid fooling ourselves. It's based on repeatability, on objective, logical processes.

	<i>Feeling</i>	<i>Both</i>	<i>Thinking</i>
Walking	Endorphins make you feel good after	When you learn to walk, you think about it, but then it becomes feeling.	Brain tells you what to do
Women	That's how traditionally they're supposed to be.	Both [men and women are] thinking and feeling all the time.	
Words	The way you feel is how you choose the words you use daily.	Inspire emotion, but you must think them first You can read a newspaper, you can read poetry.	Thoughts are said in words when talking They're a higher brain function.

SUMMARY

Most visitors believe that there is a difference between thinking and feeling. Thinking tends to be associated with a more logical, rational and intentional processes while feeling is more closely associated with an intuitive, sensory reaction or a state-of-being. Although most visitors believe there is a difference, they also believe that thinking and feeling are connected in some way. How they are connected is not well understood or at least not well-articulated by the visitors interviewed.

From the sorting task, we've found that visitors believe that human beings are both thinking and feeling creatures. In general, we are not more one than the other. However, some visitors believe that there is a difference between the genders; men are more thinking, and women are more feeling. A few visitors believe we start out being more 'feeling' and grow up to be more 'thinking' beings.

Visitors believe that activities such as science and art involve some degree of feeling and thinking. However, visitors believe that science requires more thinking and art requires more feeling. In addition, visitors realize that traditionally 'cognitive' activities such as decision-making and knowing require both feeling and thinking. Alternatively, visitors claim that a concept such as *intuition*, long associated with feeling, can have a 'thinking' aspect since intuition is based on thinking about our past experiences.

In summary, although visitors believe there is a difference between feeling and thinking, they also believe that both come into play in people and in activities, even those which we previously considered purely 'cognitive' or purely 'intuitive'.

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APPENDIX – INTERVIEW QUESTIONS

1. What comes to mind when you hear the word ‘thinking’? [What words come to mind?]
2. What come to mind when you hear the word ‘feeling’? [What words come to mind?]
3. In your opinion, is there a difference between thinking and feeling? *YES / NO*

What do you think that difference is?
4. In your opinion, are thinking and feeling similar in any way? *YES / NO*

How so?

BOARD

Can we try something?

Here are some words written on post-its. I would like you to place each post-it where you think it belongs <use sorting board>. So, if you believe a post-it has more to do with feeling, just stick it on the feeling side. And if you believe a post-it has more to do with thinking, just stick it on the thinking side. If you think it involves both thinking and feeling equally then put it in the middle. If you believe it has nothing to do with either feeling or thinking, you can hand it to me.

There is no right or wrong answer.

Can you tell me why you placed _____ here <point> under _____?

[probe for: *Art, Consciousness, Creative, Decision-Making, Intelligence, Knowing, Men, Problem-Solving, Science, Women, and Words.*]