

Evaluation Brief EB18  
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== DRAFT ==

## A Funny Thing Happened on the *Trail of Time*

### Introduction

The *Trail of Time* is a serious, National Science Foundation-funded project. It's designed to help visitors to the South Rim of the Grand Canyon appreciate the incredibly vast amount of time it took to form the Canyon's rocks, and the considerably less-vast time it took to cut the Canyon. To design a *Trail* that effectively communicates those ideas, the *Trail of Time* evaluation team has tested a series of prototype versions of the *Trail*, both off site (in the Second City) and at the Canyon's edge.

As members of the formative evaluation team observed and talked with visitors, we saw and heard many things that made us smile, giggle, chuckle, or guffaw. (We also saw things that made us cry, but then we just redesigned the prototype.) After a long day of data collection, our funny stories were shared with other members of the team over drinks or dinner. This brief assembles the funniest stories from four years of data collection for readers to enjoy and ponder.

When funny stories are also true, they reflect on both the people who did the funny things and the people who find them funny. We can study these stories to learn about both visitors and ourselves. However, explaining a joke often ruins it, so we set up each story as best we can rather than explaining it at its conclusion. We analyze broader patterns at the end of the brief.

### Looking at the Canyon

Almost all the visitors we talked with or overheard during formative evaluation expressed awe, wonder, or spiritual feelings about their experience of the Grand Canyon. Although visitors clearly were impressed by the immense size of the Canyon, they had difficulty finding comparisons that gave it meaning. As visitors struggled to describe what they saw and felt, their attempts varied from the mundane....

*It's one of the Seven Wonders of the World, much bigger than Niagara Falls!*

...to the creative.

*You expect to see this much rock up in the air, not down below.*

However, some visitors just gave up, like the man who called his relatives by cell phone to tell them,

*Words can't describe it!*

### Walking the *Trail*

One of the major challenges of the formative evaluation has been to help visitors understand what *Trail of Time* is, and why someone put so many numbered markers along the edge of the Grand Canyon. The visitors we observed worked hard to figure out prototype versions of the *Trail*, and they did and said some funny things along their journey to understanding.

For instance, when visitors noticed the numbers along the *Trail*, they enjoyed using those numbers on their hikes. During the first-stage formative evaluation in 2004, when the prototype trail was located much closer to the road, some visitors used dates along the *Trail* to remember where their cars were parked. When we encountered visitors we had interviewed earlier on the way back from their hike, they told us things like,

*We only made it out to 980 million years, and then we had to turn back.*

On a more serious note, Park staff told us that a rescue team used the numbered markers to describe the precise location of a visitor who had fallen over the edge.

Inspired by all those numbered markers, some visitors tried to think ahead in time, guessing how the time markers might relate to their destination. A boy walking in from the 2-billion-year end of the Trail told his dad,

*I think when we are at 0 million years, that's when we will be at the visitors' center.*

They kept walking fast, so we're not sure how they felt when they reached time zero a hundred meters before they got to the Yavapai Museum.

As interpretation of the *Trail* improved, visitors had an easier time figuring out what the numbers were doing. They began to interact with the *Trail* in ways both playful and funny to others in their group. For instance, along the prototype *Million Year Trail*, children playfully paced off the markers, found their birthdays, recited the times as they stepped from marker to marker, and celebrated when they reached their goal of 1 million years. Here's an exchange within one family along the beginning of the *Trail*:

Child: *"We're waiting at 22 years ago."*

Mom: *"It'll take a few years to catch up to you."*

Mom (catches up): *"My, how you've grown!"*

Just past the *Million Year Trail*'s first time transition, a grandmother looking for her birthday ran out of single digit years. She had to locate her birthday between the 60 and 70 year markers, and she smiled when she realized,

*I'm right in here!*

A boy in another group started playing the birthday game a bit too far down the *Trail*. He was looking for his birthday at about 10,000 years before the present. His sibling used the opportunity to joke about their mother's age:

*I guess she really is 10,000 years old.*

Some visitors were inspired by the yellow color of the prototype *Million Year Trail* markers and the yellow dots along the *Deep Time Trail*. This color reminded some of another trail, followed by a little girl from Kansas. We heard a 4-year-old girl say the following as she walked along the *Trail of Time*.

Near years 3 and 4, she recited: *Follow the yellow trail. Follow the yellow trail.*

At 70 MY: *Remember, follow these steps.*

Starting at 200 million years, she sang, *Follow the steps! Follow the steps! Follow the steps!* for about 50 million years.

Of course, the color yellow has other meanings, too. One mother told us she was afraid for her young sons' safety. When she first saw yellow dots marking the prototype *Trail*, she tried to convince her boys it was a safety line that they should not cross.

Once visitors realized the name and purpose of the *Million Year Trail*, they often joked about its expected length.

*If they're really making us walk to a million, we'll be walking to California.*

*We're having to walk a million years to get to the restrooms.*

These visitors often expressed relief when they noticed that the scale changed along the trail, so that their last few steps covered 100,000 years each. One respondent joked,

*It felt like I walked a million steps yesterday.*

Then he noticed the *Trail's* changing scale.

*I'm glad I don't have to walk a million steps today!*

Another respondent jokingly accused us of “cheating,” but said that was OK, because there was “no frigging way” he was going to walk a million steps.

As visitors started thinking about the millions of years that passed along the *Trail of Time*, they sometimes expressed their thoughts in amusing ways. One 8-year-old boy said,

*Wow! A lot has passed in this world.*

Based on seeing a few circles with numbers and perhaps a sign or two, visitors came up with some pretty creative answers to their questions about what these numbers were, and why they were there. Although many visitors got the basic idea...

### *A step in our time means some time in the past*

...their search for deeper meaning sometimes led them astray. Most often visitors attached too much meaning to the precise location of each marker. Some respondents thought each and every marker must relate to something seen in the Canyon at that point. Others thought the numbers had something to do with the elevation of the *Trail* at that point, or how deep the Canyon had been carved at that time. Yet other respondents assumed the Canyon had been filled with water in the past and guessed the markers showed where the water level was in the past. Getting close to a correct answer, some respondents guessed that time markings told the ages of the rock in the Canyon, but said that while standing at markers that were only 1,000 years old.

But wait – were those statements really funny? To the evaluation team, visitors' naïve ideas about the *Trail of Time* were both painful and at least a little funny. When something made us cry, we knew we had to fix it. A major thrust of iterative prototyping was to help visitors understand that the markers were points on a timeline, without attaching too much meaning to the exact position of each marker.

Given the controversies about evolution and deep time in the United States, we weren't surprised when some visitors expressed their objections to the whole idea of the *Trail of Time*. For instance, we heard reports that young-Earth creationists had covered the three oldest markers with rocks and then stamped on another. It was reportedly done by children, with parental approval. (Although that makes us cry, we're not going to fix it!)

To facilitate iterative prototyping, the formative evaluation was conducted with paper-and-plywood mock-ups of the time markers and interpretive signage. This informality left some visitors confused. One respondent kicked at the first marker he saw, later explaining that he thought it was a piece of litter. Near the end of our July 2008 visit, the transition between the *Million Year* and *Deep Time Trails* looked even less formal than usual, with trial texts handwritten on paper taped over the laminated signs. A woman walking past with her children was heard to say,

*This must be someone's science fair project.*

Once they realized what we were trying to accomplish, many respondents made constructive suggestions to improve the *Trail of Time*. We particularly enjoyed the older couple who asked,

*Could you put the signs in the shade?*

Creative visitors also were inspired in other ways. A 13-year-old boy, who had just figured out that the 60-million-year marker was part of a geologic timeline, had a wonderful idea:

*They should do it with like every layer of rock.*

### **Understanding the *Trail's* Interpretation**

In addition to numbered markers and signs, the prototype *Trail* included labeled rock specimens as exemplars of Grand Canyon geology. These rocks attracted both young and old. For instance, one boy, about 3, first touched the volcanic rock as his dad read the label aloud. When the boy saw a big chunk of limestone anchoring a prototype label, he asked his dad if he could touch that, too, and got permission. At the 6-million-year river-polished rock his dad said, "Touch that rock as well," and walked ahead. The boy walked to the other side of the trail, said, "I'll touch that rock!" and reached out to touch first one, then a series of trail-bounding limestone boulders as he walked behind his dad.

The volcanic rock attracted much attention as it baked under the hot July sun, and visitors had some fun with it. A woman called to members of her group as they caught up,

*You see that volcanic rock?*

And her son exclaimed,

*Yeab, it's still warm!*

This boy was old enough to be joking, but younger children sometimes misapplied their knowledge of volcanoes. When his mom explained the black rock was lava, a 4 year old touched it and said,

*It's still hot!*

His mom recognized his confusion and explained, “That’s from the sun.” Even older visitors were confused about this specimen, perhaps not realizing that the volcano made it very long ago. A 19-year-old woman touched the volcanic rock and exclaimed,

*Whoa, it’s hard!*

Many of the wayside sign suggested things that visitors could do along the *Trail*, like touch a rock or look for the Colorado River. Visitors often took these suggestions very seriously and would do almost anything to comply (even leaning over the edge of the Canyon to see the river). One of the wayside signs compared the rings in a tree cross section to the ring-like layers in a sample of spring-deposited travertine. The text told visitors to “count the rings,” without being too specific about which rings to count. During a short break in the evaluation, when the travertine rock was off display, a young boy clambered over rocks at the edge of the trail and squeezed behind the plywood sign board. We found him counting the tree rings on the back side of the plywood.

We also discovered that the word, “rock,” means different things to different people. During a 2007 test of the prototype brochure, a mother read aloud about the white rock of the Coconino Formation. The parents looked for the white cliff across the Canyon, but their children looked down and picked up small white pebbles. They expected rocks to be small chunks on the ground, like the ones they found back home in Nebraska.

Of course, children love to find fossils. We watched a girl, about 10, picking through pre-dinosaur-age Kaibab Limestone fragments. When she found a triangular piece, she said,

*Maybe this is the tooth of a pterodactyl!*

It’s not just children who say funny things about the Canyon’s geology. As we talked with adults about the Canyon, they revealed some painfully funny ways of thinking about the Canyon’s rocks and the processes that formed them. When one visitor read the prototype brochure about the Tapeats Sandstone, she said she was confused.

*I thought more years was the toppest layer.*

Visitors often joked half-seriously about stealing wayside rocks, especially the travertine and river-polished boulder. They sometimes even picked the samples up and “pretended” to carry them off. One woman explained how she had tried to pry a corner of the basalt off to take home with her. Perhaps we should follow the lead of Hawaiian Volcanoes National Park and make signs describing the curse that follows home each rock stolen from the Canyon. (Does the Goddess Pele do road trips? See <http://www.snopes.com/luck/pele.asp> )

Many visitors arrived with alternative explanations for how the Canyon formed. One family argued about the Canyon’s origins as they walked past time zero from Yavapai. The mom argued that the Colorado River eroded the Canyon, the dad said glaciers, the younger son said it was a meteorite that hit the ground, and the older son had a complex explanation that involved rain and rocks hitting other rocks. The Mom gloated as she read the label at 6 million years. A Maryland couple discussed the Canyon’s erosion as if it was filled to the brim with water. They compared it with the undersea Baltimore Canyon, where the husband went fishing. A believer in Biblical-time thought other folks attributed the Canyon to the “Big Bang,” but he didn’t accept that theory. As we talked with these visitors, we tried to set them straight, but one visitor said that it was unimaginable for her that the Canyon was cut by just water.

It's important that visitors connect exhibit interpretation to things they already know, and we saw that happening at the climate cycles diagrams on prototype labels. As he spotted one such diagram, a visitor exclaimed to his companions,

*Look, Al Gore!*

Another asked...

*Where is Al Gore?*

..before expressing doubts about global warming.

Some visitors went beyond the *Trail* interpretation and created their own educational experiences. For instance, one 12-year-old girl read about erosion at the 6 million year wayside and then picked up two rocks as she walked westward along the *Trail*. When we approached her family at the 70 million year wayside, she was busy hitting the rocks together, trying to erode them away. We also met a family of homeschoolers, whose parents were really into facilitating educational experiences for their children. They shared the story of how they were walking eastward from El Tovar and bemoaning the fact that there wasn't any interpretation along the trail to explain the power of erosion and the marvelous feat of the river carving the Canyon. At that point the heavens opened, rain poured down on the sandy soil, and little rivulets started forming across the trail and over the canyon side. Inspired by what they saw, the whole family crouched along the side of the paved trail and dug a small channel. The children watched as a tiny trickle quickly eroded into a large stream, carrying debris over the edge. The parents told us they were delighted when they came to the 6 million year wayside, as it confirmed and reinforced everything they had explained to their children.

Although they sometimes arrived with their own explanations for the Canyon's geology, most visitors appreciated the interpretive signs along the *Trail of Time*. We were surprised, delighted, and perhaps a bit disturbed when visitors took digital photos and videos of the early prototype labels. As one visitor explained,

*I'm from Boston, Mass. I figure I'll take it home and put it on my computer. I don't have time to read it now.*

Of course, when digitally delayed, visitors' learning lacks the spectacular context provided by the Grand Canyon. We agree with the visitor who said,

*You can read it in a book, but your eyes glaze over. It's better in little bits along the trail.*

### **Why is *that* Funny?**

Admit it – did you fail to see the humor in some of these stories? Were some stories just not funny? Did you find some stories insulting to the folks who lived them? Most theories of humor take those differences into account. Here are three major theories about why people laugh (Brain, no date).

- The **incongruity theory** says people laugh when presented with things that just don't fit together – that defy logic or seem very unfamiliar.
- The **superiority theory** says people laugh when a story focuses on the mistakes or misfortunes of others – they feel superior to the person in the story and far enough removed from the situation that they can laugh.

- The **relief theory** says people laugh as tension or suspense is released – an aside or flippant remark breaks the tension, inducing laughter.

Much of the humor discussed in this brief involves either incongruities between what visitors said and our expectations, or mistakes and misstatements by visitors. We smiled or laughed as we recognized the incongruities, and perhaps because we felt superior to the confused visitors in the story. If you didn't laugh, perhaps you didn't know enough about the *Trail* or Grand Canyon geology to recognize what didn't fit or was mistaken. Or perhaps you didn't laugh because you are disinclined to feel superior to visitors. (As evaluators, we prefer to laugh with visitors, rather than at them.)

Of course, educators have a long history of studying learners' alternative ways of thinking. They also like to have a little fun with them. These teacher-created websites are examples: [Kids' Ideas about Science](#) and [Astronomy Students Say the Strangest Things!](#) The astronomy teacher writes, "This certainly demolishes my illusions of teaching effectiveness," but the statements also show creative thinking by the students. (A bit too creative, perhaps.)

The visitor comments that close the major sections of this brief were chosen to fit the relief theory – to break the tension that builds as readers pursue their task. If you didn't laugh, maybe you're too laid back.

#### References Cited

Brain, M. (no date). How laughter works. Retrieved September 29, 2008, from the How Stuff Works Web site: <http://people.howstuffworks.com/laughter.htm>