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Mind, Spirit, and Body

Assessing Interactives through Multiple Lenses

David Whitemyer

A family views Virtual Reality in the "Raid Experience," part of the *Duty First* gallery at the First Division Museum at Cantigny Park.

Intellectual interactives encourage questioning, **emotional** interactives foster visceral responses, and **physical** interactives push visitors to learn through moving.

"Interactivity" in museums has evolved significantly from the early 1960s when Michael Spock, as the director of the Boston Children's Museum, revolutionized the visitor experience by promoting "hands-on" exhibits, through the 1990s when "interactives" was the buzzword in every museum, to today, where dynamic, didactic, and often digital exhibit interactives are commonplace. There's an expectation, by both visitor and institution alike, that exhibitions – whether in art museums, science centers, or history venues – will include experiences beyond viewing and reading, such as touching and manipulating.

With this expectation – and pressured competition from non-cultural "entertainment" venues – how can interactivity be used to strengthen museums as unique providers of informal learning opportunities? One way is to develop interactive exhibits that engage visitors through at least two of these three human lenses: **intellectual**, **emotional**, and **physical**. "Incorporating multiple lenses or modes of engagement in an interactive can create a sense of being holistically connected," suggests Beverly Sheppard, independent museum consultant and educator.[1] "The more ways you are processing stimuli, the more you are learning." From 2006 to 2011, Sheppard served as the president of the nonprofit Institute for Learning Innovation,[2] where she researched, wrote, and spoke frequently on this topic.

Visitors interact with exhibitions in many ways, and so "interactives" can include things such as tactile experiences with touching or manipulating, immersive experiences combining sound and scenery, or engaging with some type of multi-media element. **Intellectual** interactives encourage questioning, **emotional** interactives foster visceral responses, and **physical** interactives push visitors to learn through moving. This essay touches on four examples of interactives that successfully incorporate two or more of these lenses. While some of these examples were mounted as long as 25 years ago, each provides valuable lessons in providing interactive experiences through dual lenses, and have shown success by their longevity, consistent attendance, and positive feedback of museum staff and reviewers.

- *Science in the Park*, Museum of Science, Boston, Massachusetts
- *Remember the Children: Daniel's Story*, United States Holocaust Memorial Museum, Washington, DC
- *Numbers in Nature*, Museum of Science and Industry, Chicago, Illinois
- *Duty First, Raid VR Experience*, First Division Museum, Wheaton, Illinois

Each of these examples engage visitors through multiple senses: touch, sight, and sound. But they also seem to go a few steps forward. "A great thing about multisensory experiences is that they don't separate the mind from the body," says Sheppard. "Combining intellectual understanding with physical experience can be very effective for learning new things and creating new patterns in your brain."[3]

1 Beverly Sheppard, interview with author, March 16, 2018.

2 For more information about ILI, see: www.instituteforlearninginnovation.org.

3 Beverly Sheppard, "A Summary of Key Messages from: *Learning Science in Informal Environments: People, Places, and Pursuits*," Report of the National Research Council of the National Academies (January 2009).

The World is My Playground

At nearly 20 years old, there's a reason that the *Science in the Park* – an exhibition at Boston's Museum of Science – is still so popular: It works! The exhibition uses familiar playground equipment to "teach" families about basic principles of physics, such as inertia, momentum, and force. Children can race each other – or a row of flashing lights – on a sprinting track, or lift 500 pounds of sand with a lever. They can play on swings and a seesaw, testing and measuring at the same time. *Science in the Park* so perfectly provides an interactive experience through intellectual and physical lenses that the museum's website says, "You'll not only apply your thinking skills to the mechanics of movement, you'll also set most of the experiments in motion" (fig. 1).

Science in the Park succeeds on two fronts suggested by Sheppard, "For children, *play* produces learning," and these types of exhibits have "the added benefit of encouraging more conversations between young and old." In fact, educators and designers in the museum have observed parents talking with their children about the principles of physics they're experiencing, says Mike Horvath, the Director of Exhibit Design and Production.[4] It's an exhibit strategy that the Museum of Science considers throughout the facility.

"One thing we're looking at for all future exhibits is to inspire both physical and mental modes of engagement," explains Horvath. "If you pack the museum full of things to read and to drain your mind, that's not a successful strategy; nor is one where people are engaged in so much physical activity that they don't rest." And so, the museum is striving for somewhere in the middle.

The exhibition itself has been a bit of an experiment. About four years ago, it went through a partial redesign. In addition to some safety and accessibility upgrades, there was an effort to improve the graphic design. "In a space that's so active, it's hard to get people to pay attention and to read," says Horvath. "We took our latest knowledge about label strategy and applied it to this gallery." This included replacing large blocks of didactic text with pictures and diagrams. This simple strategy has improved the exhibit's successful formula of combining physical activity with scientific information, as the museum has observed more adults and children stopping to read the graphics while they play.

4 Michael Horvath, interview with author, March 30, 2018.

In Someone Else's Shoes

Of the three lenses through which to develop interactives, the combination of physical and emotional may be the most challenging, simply because the intention is to touch the heart of the visitor, as well as the mind. At the United States Holocaust Memorial Museum in Washington, DC, this combination is effectively accomplished in the exhibition *Remember the Children: Daniel's Story*, which opened in 1993. Here, visitors explore scenic environments representing different moments in Daniel's life during the late 1930s and World War II, while touching and lifting various items, and listening to an atmospheric soundscape that evokes the drama and dialogue of the Holocaust's early years.

In a *New York Times* article written soon after the museum opened, one of the exhibition's developers is quoted as saying, "The goal was to engage children and tell the story of the Holocaust in a way that was real, without frightening them."[5] To do this, and to successfully meld physical and emotional interaction, the museum consulted with psychologists, educators, children's museum specialists, and Holocaust survivors.

The story is not an easy one to tell. It details the experiences of one family in Nazi-occupied Germany during the Holocaust, told through Daniel, a young boy. The exhibition was developed for visitors between the ages of eight and 12, and includes sensitive and sometimes frightening subjects. One suggestion as to why the exhibition is effective is that environmental interactives have the potential to immerse people in a multisensory experience, and by taking visitors out of their comfort zone, the interactive can stimulate a new set of responses.[6] The physical interaction within this exhibit – exploring, touching, lifting – elicits emotional engagement as well (fig. 2).

5 Suzanne Slesin, "Through a Child's Eyes, History and Tragedy," *The New York Times*, June 3, 1993.

6 Beverly Sheppard interview.

PUBLIC DOMAIN

fig. 1. Families enjoying the fun and physics of playground equipment at *Science in the Park*, Museum of Science, Boston.

BILL FITZPATRICK/UNITED STATES HOLOCAUST MEMORIAL MUSEUM

fig. 2. Two young visitors pause to read Daniel's diary, which tells of his family's deportation to Auschwitz, in *Remember the Children: Daniel's Story*, at the U.S. Holocaust Memorial Museum in Washington, DC.

The interactives are intentionally low-tech so as not to take away from the holistic experience and so that they're easily approachable by all ages. The designers for the exhibition understood that some children are lookers and interested in words, while others have a more physical relationship to the world around them.[7]

Techniques such as lift-and-flips allow children (and other visitors) to open the lid of a cookie box or the top of a suitcase belonging to Daniel's younger sister, Erika, to see objects from the family: a favorite doll, a snack, a coat with a yellow Star of David, etc. The theatrical setting – a Frankfurt street, a bedroom, a kitchen, a deportation room, etc. – takes visitors through increasingly dark environments towards the final destination, a concentration camp; and encourages exploration and tactile engagement. With the soundscape of creaking floorboards, Yiddish voices, and babies crying, it is an emotionally charged story overlaid by a physical experience, giving visitors the space to be immersed in Daniel's tale.

The melding of interactives in *Daniel's Story* that connect with visitors both physically and emotionally seem to support what free-choice learning expert John Falk suggests, which is that visitors tend to retain less factual content and more contextual.[8] And it is the balance of accommodating multiple visitor senses that makes the interactions effective.

7 Slesin, "Through a Child's Eyes."

8 John Howard Falk and Lynn Diane Dierking, *Learning from Museums: Visitor Experiences and the Making of Meaning* (Lanham MD: Rowman & Littlefield, 2000).

The Grapes of Math

Sheppard suggests that museums and exhibit designers should consider how interactives achieve the goal of prompting questions, rather than just being entertaining, in order to create more effective, educational experiences. At Chicago's Museum of Science and Industry (MSI), the exhibition *Numbers in Nature* does just that. Connecting with visitors through both physical and intellectual stimulation, inquiry about math and patterns is born out of fun and exploration. The exhibition exposes and explains the natural world's familiar patterns: from the delicate nested seeds of a sunflower to the spirals of galaxies. The interactives illustrate patterns found in nature, music, art, architecture, and even the visitors' own bodies. The exhibition has been so popular that MSI created a traveling version currently making its way around the United States.

In addition to numerous hands-on – both digital and manipulative – interactives, as well as graphics and artifacts, *Numbers in Nature* includes two very enjoyable full-body experiences. The first is the "Mirror Maze," an 1,800-square-foot fun house of sorts, where visitors explore and get lost in what feels like an infinite forest of mirrors and triangles. Visitors physically interact with this exhibit by walking, running, and sometimes crawling. They reach out their arms to discover if what they think they're seeing is a reflection or a possible passageway (fig. 3).

fig. 3.

Children exploring the "Mirror Maze" in the *Numbers in Nature* exhibition at the Museum of Science and Industry, Chicago.

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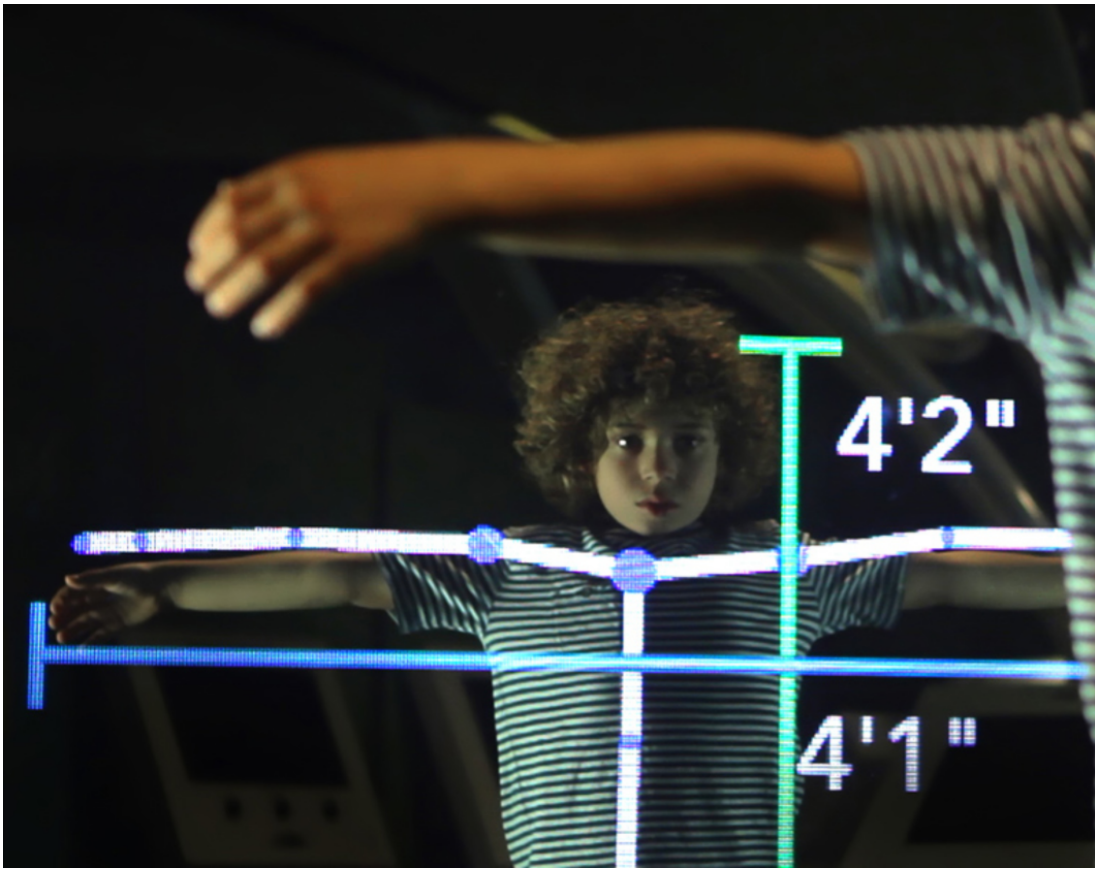

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fig. 4.

A young visitor discovers his height and width proportions at the "Vitruvian Man" exhibit in *Numbers in Nature* at the Museum of Science and Industry, Chicago.

The intellectual touchpoint is simultaneously blatant and subtle. While children are maneuvering through the maze, the arrangement of symmetry and tessellation introduces them to patterns and numbers. Within these immersive patterns are dead ends – small secret rooms – that reward explorers with bonus puzzles, artifacts, and mathematical wizardry. It's the merging of movement through physical space with the clear lessons about patterns in nature that makes this interactive so entertaining and successful; or as an article in *Time Out* magazine said, "The exhibit cleverly introduces mathematical concepts without hitting visitors over the head with complex equations."[9]

After exiting the "Mirror Maze," visitors have an opportunity to interact with yet another exhibit that combines body movement with mathematical concepts. Standing in front of the "Vitruvian Man" interactive, visitors spread their arms while a Microsoft Kinect camera detects their limbs, hands, feet, and head. On what looks like an enormous mirror, visitors then see their doppelganger stick figure, complete with height and arm-spread measurements. They can wave their arms and shake their legs, making their figure move and dance. The learning objective is to show visitors how close they are to the "ideal" geometry and human proportions made famous by the ancient Roman architect, Vitruvius (fig. 4).

9 Zach Long, "'*Numbers in Nature*' Puts a Maze in the Museum of Science and Industry," *Time Out*, October 8, 2014, http://goo.gl/tnwu6L.

The Future is Here

It can be argued that Virtual Reality (VR) via a headset is a non-interactive experience. In one sense (pun intended) it's passive, where the individual is viewing a full-wraparound 3D film or space via goggles and headphones – unless there are VR gloves or a handset, there's little or no way to control the experience. But staff and guests at Cantigny Park's First Division Museum in Wheaton, Illinois, might argue differently. They have experienced and observed examples of both physical and emotional interaction with VR. Paul Herbert, the museum's executive director, says, "We want to engage our visitors in a way that makes them empathize with soldiers," and the VR experiences assists in doing just that (intro image).

The museum's new *Duty First* gallery is a 2,500-square-foot space devoted to contemporary missions of the 1st Infantry Division, a combined arms division of the U.S. Army, and the oldest continuously serving in that branch. Up to 12 visitors can sit inside a fabricated Blackhawk helicopter, put on VR headsets, and virtually accompany 1st Division soldiers as they conduct a raid on foreign soil. The goal of the exhibit is to show visitors that soldiers are highly trained and have to make difficult decisions in rapidly changing situations. The museum felt that the best way to do that wasn't through a didactic graphic panel or even a film, but by virtually putting visitors in the boots of the service members.

The emotional interaction can be intense. "We've had visitors, with sons, daughters, or spouses in the military, who are close to tears and sometimes need a moment to rest," says Gayln Piper, the museum's Director of Programs and Education.[10] "They tell us things like, 'I didn't know what it was like for him, but this helped me to understand.'" Staff has observed veterans talking to family about their wartime experiences for the very first time. Veterans state that the exhibit provides a tool for sharing, to talk about their mission(s), and even about PTSD.

As for active physical interaction, "We tell visitors that if they're susceptible to motion sickness, they may have to stop in mid-program," explains Piper. A few visitors get dizzy or feel nauseous. With the headsets donned, individuals spin their heads, lean forward, reach out their arms, and sometimes bump into each other. There's a generational intuition connected with this type of VR experience. Docents sometimes have to instruct older guests that it's a 360-degree experience, and that they should look around, "but you don't need to tell 12 year-olds what to do," says Piper.

It's visitors' body movement that turns the soldiers' raid footage from just a film into a truly immersive and interactive experience. The combination of physical sensation with the drama and fear conveyed in the film is what makes this a memorable and successful interactive exhibit, similar to the emotional-physical blending in *Daniel's Story*.

Conclusion

"Learning is not about acquiring information," says Beverly Sheppard, paraphrasing one of her favorite quotes, "but rather about creating meaning from experience, action, and thought." Museum interactives that visitors experience through **emotional**, **physical**, and **intellectual** lenses encourage that meaning-creation to occur. These four examples are popular and successful because they engage the visitor and convey an idea through at least two of those lenses.

This is by no means a suggestion that designers and exhibit developers stop creating interactives that provide simple opportunities for tactile experiences and experimentation through play. Those are incredibly valuable. Rather, it's an encouragement to think beyond single-lens interactives, when time and budget allow, and to take advantage of the deep learning opportunities that multi-lens experiences can provide.

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10 Gayln Piper, interview with author, March 27, 2018.