

## Folk Illusions as Emic, Educational Prompt

by K. Brandon Barker

It is well established that illusions—when considered as a part of perceptual experience—facilitate learning. Visit the juvenile nonfiction section of educational books on illusions at your local library, and you will find a plethora of texts aimed at teaching youths about the wonders of perceptual oddities with titles like *Now You See It—Now You Don't*, *Amazing Optical Illusions*, *Seeing Is Believing*, *Awesome Optical Illusions*, *Cool Optical Illusions*. In those books, you will find many textual performances of a well-worn, literary trope I call the Illusion-Surprise.

I begin, here, a version of the Illusion-Surprise by guiding your attention to an object on the page, like the object below (see Figure 1). Next, I ask you to question that which you perceive: “Is seeing really believing? Can you tell which of these orange circles is larger?” The next question is perfunctory: “Are you sure?” If you have some familiarity with illusion literature and especially if you are a fan of optico-geometric illusions, then it is quite likely you have seen the object in Figure 1. This is the Ebbinghaus Illusion.<sup>1</sup> Because of the relative size of the blue circles that surround the orange circles, the orange circle on the left (the orange circle that is surrounded by larger blue circles) is seen as smaller than the orange circle on the right. See? Returning to the formula of the trope, I tell you now to take out a ruler and to measure the orange inner circles. “See?” I should ask again. “Seeing is *not* always believing!” And, presto, the Illusion-Surprise ends successfully as your ruler shows you that the inner circles are, in fact, the exact same size.<sup>2</sup>

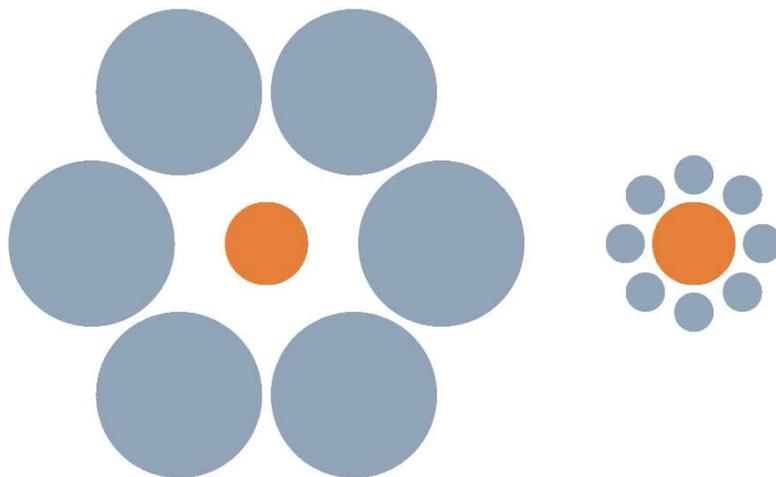


Figure 1. Which of the two orange circles is larger?

What is unclear about the Illusion-Surprise trope is whether readers—including youths and adults—are actually surprised to learn of the illusory tendencies of perception when they see an optico-geometric illusion on the page or screen. Even if you have never seen the Ebbinghaus Illusion presented above and even if you are surprised by its particular characteristics, is it the case that you have never seen (or heard, or felt) any illusion? That, I suggest, would be truly remarkable. And, when we consider the Illusion-Surprise trope alongside other cultural performances that feature perceptual illusions, we begin to realize that people, generally, are not even slightly naïve to the illusory tendencies of perception. After all, illusions that arise from natural contexts like the Waterfall Illusion and the Moon Illusion have been recognized since antiquity, and performed illusions appear frequently in a range of cultural contexts, including art, performing arts, warfare, religion, and—as we have just discussed—in a plethora of educational literature.<sup>3</sup>

Herein, I want to focus on the fact that illusions also feature in children’s traditional play. Folk illusions constitute a genre of play in which performers trick their own or their playmates’ perceptual systems into perceiving an intended illusion.<sup>4</sup> Obvious examples are the Rubber Pencil trick, listening for the sounds of the ocean in a conch shell, and sly aunts and uncles who steal little noses from their two- and three-year-old nieces and nephews. In studying folk illusions for the past several years, my fellow researchers and I have found that, beginning around the age of seven, youths themselves frequently know about and are eager to perform several of these kinds of illusory tricks. Including variants, we have found more than one hundred folk illusions, including illusions performed across every perceptual modality. We have gathered remembrances from 21 states in the U.S. and from a total of nine countries on four continents.

Considering folk illusions alongside the Illusion-Surprise trope, we recognize the latter to be an example of not just a worldview dominated by writing (and by extension the verbal) but also an example of adultocentrism, long considered an ethnographic pitfall in children’s folklore.<sup>5</sup> The genre of folk illusions suggests that perceptual illusions already have a place in children’s worldviews, and following Paddy Bowman’s charge that educators “must gauge cultural awareness,” we should consider forms within the genre as avenues for incorporating the implicit knowledge that children and youths bring to bear on an ancient and pervasive philosophical problem—the complex relationships between mind, body, reality, and social interaction.<sup>6</sup>

### **Folk Illusions as Classroom Activity**

For the development of our catalog of folk illusions, I and my colleagues have administered surveys to college-aged students and gathered remembrances from dozens of adults. But, the most important insights of the study have come from working with middle-school students, summertime campers, Scouting participants, after-school program participants, and preschoolers in Louisiana and Indiana. The heart of these interactions has consisted of three steps: (1) showing participants a few illusions, (2) explaining some scientifically understood psycho-physical mechanisms that give rise to the illusions, and (3) asking the participants if they know any similar activities. In my experience, it is not enough simply to ask students if they know of any illusions for, unlike games, songs, and other playground activities, the category of folk illusions tends not to be represented in vernacular lexicons. Instead, it is the doing and performing of illusions that prompt dialog and interaction. What follows is a description of three folk illusions that I have successfully performed in educational settings.

For a video selection of 16 folk illusions, visit

<https://purl.dlib.indiana.edu/iudl/media/s55m312x7z>.

### Zane's Illusion, An Optical Illusion

Each participant can perform Zane's Illusion by (and for) herself. She should simply place the underside of her right forearm (the same side as her palm) against her nose and between her eyes. In this position, her hand will be pointed toward the ceiling, and her forearm will be perpendicular to the ground. Then, she should stare ahead while she slowly passes her left pointer finger in front of her forearm. The pointer finger will be parallel to the ground. The strange visual experience is striking for almost every participant. I recommend having the entire class perform it all at once if for no other reason than to hear a chorus of gasps and laughter.



Zane's Illusion is named for the nine-year-old boy who originally showed us the trick in the spring of 2017. He even reported that he had come across the illusion by chance while fiddling with his fingers one boring school day. It remains an open-ended question how often visual illusions involving hands and fingers emerge as youths pass the time, but in a true instance of polygenesis, another ten-year-old boy showed us a variant of Zane's Illusion in the winter of 2017. He, too, reported discovering the phenomenon: "I just figured it out by myself."<sup>7</sup> Of course, there is a much more widely recognized folk, optical

illusion involving the hands and fingers known variably as "floating finger," "floating sausage," or "sausage fingers." In a performance of Floating Finger, both tips of both pointer fingers are pointed at one another as they are held parallel to the ground in front of the performer's face. As the performer moves the fingertips closer together, an illusory floating finger appears between the two tips of the actual pointer fingers.<sup>8</sup>

Each of these visual illusions is the direct result of binocular vision. Zane's Illusion, especially, demonstrates that two separate images—one from each eye—must be coalesced by perceptual processes of the central nervous system for us to perceive a seamless visual field. That is, the human visual system typically depends upon physiological inputs from two eyes that are separated by a distance of about 6.5 centimeters.<sup>9</sup> When the forearm is placed between the eyes, it becomes an additional, artificial barrier. As the pointer finger is passed in front of that forearm/barrier, higher-order visual processes in the brain are forced to select from the disparate inputs of each eye. Such competition is known as binocular rivalry. In Zane's case, the rivalry results in visually askew perceptions that the pointer finger is "invisible" or "foreshortened."

### The Church Bell: An Auditory Illusion

The Church Bell illusion requires a few household items, but the illusion is so powerful that the preparations are worthwhile. You will need a few metal coat hangers (hangers made completely of metal with no cardboard, wooden, or plastic rods work best), a spool of yarn or strong thread, and scissors to cut the yarn into segments approximately three to four feet in length. Next, tie the middle of one length of string to the hook of one of the hangers. Now, a performer wraps the ends of the yarn around her pointer fingers two or three times; then, those wrapped fingers are placed

into the performer's ears. From this position, the performer swings the hanger, banging the hanger up against a hard, metal object, such as a table, a chair, or the metal tracks beneath black- and white-boards that hold chalk and markers. The performer—and only the performer—will hear a cacophony of church bells.



We have gathered remembrances of youths performing the Church Bell at summer camps, and the activity is sometimes featured as an exhibit in children's science museums. The folkloric quality of the illusion, however, can be confirmed as early as the 17<sup>th</sup> century. The French philosopher and physicist Jacques Rohault mentions the trick in his *Treatise on Physics* (1671) as a "diversion" for children. At that time, Rohault explains, children performed the illusion using the metal tongs and the andirons of the fireplace. The activity is clearly related to other activities featuring physical vibration of a string and auditory play, such as

the well-known telephone experiment, in which children use a long string and two Styrofoam cups to talk across distances. Likewise, the physical components of soundwaves commonly appear in educational introductions to auditory experiences ranging from musical harmony to sonic booms. The Church Bell demonstrates the importance of proximity between the vibrating hanger, string, finger, and the mechanisms of the inner ear.

That said, the Church Bell's traditional name also offers an opportunity for discussion of art in everyday culture. Like the regional lexical varieties—*firefly* and *lightning bug*—that name the visual experience of a bug that flies and glows at night, "church bell" constitutes a traditional selection of an expressive metaphor. After performing the Church Bell illusion, I ask participants if other metaphors and descriptions come to mind. If "church bell" is the perfect name for this activity, I ask if we can say why. Similarly, this folk illusion provides a fresh opportunity for discussing the embodied nature of subjective vis-à-vis objective experience. I have found it rewarding to have half of a class watch the other half of the class perform Church Bell. The naïve observers get to laugh at their performing classmates' astonished faces—not knowing or understanding why they, too, will soon be astonished by the reality of the illusion.

### **Falling through the Floor, a Proprioceptive Illusion**

A performance of Falling through the Floor involves two participants. One participant, the experiencer of the illusion, lies face down on the floor (a soft mat or rug is helpful) with his arms stretched out above his head and with his eyes closed. The other participant holds the experiencer's wrists and lifts the experiencer's upper torso off the floor for about 30 seconds. At the conclusion of this 30-second lifting period, the experiencer's arms and body are lowered very slowly back to the floor. The experiencer will feel as though he is falling through the floor.

Falling through the Floor provides an opportunity to discuss less apparent aspects of perception that go beyond the five Aristotelian senses of vision, touch, smell, hearing, and taste. Falling

through the Floor is, in fact, an illusion of *proprioception*, which can be defined as one's perception of one's own body in space. Using laboratory instruments such as mirrors, cameras, and mechanical vibrators, experimental scientists can create a multitude of proprioceptive illusions, including phantom limb(s), illusory perceptions of falling, stretching, shrinking, floating, and of bodily displacement. Interestingly, the exact causes of proprioceptive illusions remain unclear. Some scientists and philosophers suspect that neurological explanations of proprioceptive illusions will likely require an "active" rather than a "passive" understanding of perception. In this line of thinking, proprioceptive illusions involve a complex intermingling of incoming, physiological stimuli with dynamic, active brain processes that constantly rely upon past experience to perceive the present.<sup>10</sup>

In variants of this folk illusion, the experiencer's feet are held in the air so that his legs feel as though they are falling through the floor. Verbal characterizations of the activity vary as well, describing the illusion as a sensation of "freefalling," of "falling off a building," and of "being buried in a grave." The latter, more macabre description is related to other séance-like activities that feature sensations of falling or floating—the most well-known being Light as a Feather, Stiff as a Board, and Floating Arms (a.k.a. "the doorframe trick"). We have gathered remembrances from college-aged students who, while growing up, performed Falling through the Floor or one of its variants from every major region of the United States. Given the unusual bodily position the illusion requires *and* the vulnerability inherent in the 30-second lifting period, Falling through the Floor demonstrates youths' deep, social commitment to the intended purpose of the activity and of the genre as a whole—to perceive an illusion. Folk illusions work in educational settings precisely because children and youths know about perceptually strange, reality-testing experiences, so they are eager to have new ones.



### **New Folk Illusions?**

Having demonstrated and performed a few folk illusions with participants and having appropriately explained some of the perceptual processes that facilitate illusory experience, I conclude every educational visit by asking the youths if they know of any other activities that create tricky, illusory perceptions. Almost always, they have some new variant or some completely new form to share. In these moments, when I learn new examples of folk illusions from students, I fully recognize the importance of seeing through the Illusion-Surprise trope and of gauging the students' cultural awareness of the illusions. That is, by showing interest in youth's folk illusions, educators expose our students to the underlying, co-constructed nature of social (even educational) reality.

When things have gone very well, the student-participants—now consultants—become empowered in their playful excitement. Just as the subjective quality of illusions lends itself to personal points of view, the intersubjective quality of folk illusions leads the study of illusions to

## Share Your Illusions

Like all research programs in folkloristics, the study of folk illusions is necessarily a communal project. I have worked extensively with Claiborne Rice, who co-authored several of the works cited in this article. I have worked with graduate and undergraduate students who have answered our surveys and who have, at times, conducted fieldwork sessions with children. I am grateful for the many remembrances from adult collaborators that have contributed to the project and, most importantly, I am grateful to the parents, teachers, and Scout leaders who have allowed us to work directly with youths.

Even with all of this help, we can be certain that our list of folk illusions is not complete. Educators working with children—especially children between the ages of seven- and seventeen-years-old—are highly encouraged to share the three illusions in this article with their students and to prompt their students to share similar activities. Barker and his co-researchers will be very thankful for readers to participate in growing the catalog of folk illusions by emailing descriptions of any newly gathered forms or variants of folk illusions to [shareyourillusions@folkillusions.org](mailto:shareyourillusions@folkillusions.org).

(2016, 8). For more examples of the trope in juvenile nonfiction, see Green (1997, 14), IllusionWorks (2004, 3), Wick (1998, 8-9), Simon ([1976] 1998, 6-7), Baum and Baum (1987, 3).

It is worth noting that the Illusion-Surprise trope also appears in the professional and peer-reviewed writings of psychologists, cognitive scientists, and other scientists of illusions. For previous discussions of the phenomenon in these “adult,” academic contexts, see Rice and Barker (2017, 52) as well as Barker and Rice (2018, pages tk).

3. The Waterfall Illusion is a visual, motion-aftereffect illusion that occurs after staring at a waterfall for a priming period of about one minute. When that time has passed and an individual looks, for example, at the rocks or cliffs next to the waterfall, the stationary rocks look as though they are rising upward, see Gregory ([1966] 2015, 109-12). In the Moon Illusion, the moon is reported to look larger when it is close to the horizon and smaller when it is higher in the sky. For a discussion of the history of these and other ancient illusions, see Johannsen (1971, 134-5).

4. See Barker and Rice (2012, 2016) for a more thorough introduction to folk illusions. For a complete study, see Barker and Rice (2018). For discussions of folk illusions in the contexts of science, see Rice and Barker (2017) and Martinez-Conde and Macknik (2016).

5. For a discussion of pedagogical problems resulting from adultocentrism and a comparison of adultocentrism to ethnocentrism, see Bauman (1982, 173-4).

6. See Bowman’s discussion of teaching teachers in *Through the Schoolhouse Door* (Bowman and Hamer 2011, 30-5). For Bowman, gauging the cultural awareness (as well as political orientations) of her students remains both a pragmatic and an ethical choice: “I want to honor the expertise of my students...” (32). In this overlap—where ethics guide the folklorist’s work—we recognize the shared existential roots of folklore in education and well-grounded performance theory. Perceptual illusions always arise from our interaction with our immediate ecological surroundings; to have our students learn from illusions, educators must begin in the same localized space.

7. This ten-year-old happens to be Lucas, the boy who features in the second and third videos—the Church Bell and Falling through the Floor—linked herein.

emic perspectives. Finally, the emic perspectives of children and youths become paramount; who better to explain the depths of unreality than those whose folk practices are best equipped to experience it?

*K. Brandon Barker is Lecturer of Folklore in the Department of Folklore and Ethnomusicology at Indiana University. Before arriving in Bloomington in 2013, he worked as folklorist and program director with Southwest Louisiana’s Evangeline Area Council, Scouts BSA on their high-adventure and conservation program, Atchafalaya Swamp Base ([bsaswampbase.org](http://bsaswampbase.org)).*

## Endnotes

1. The illusion takes its name from the German psychologist Hermann Ebbinghaus, who reportedly first discovered it. It is also alternatively referred to as Titchener Circles, for Edward Titchener, an Oxford philosopher and psychologist who first wrote about the Ebbinghaus Illusion in English.

2. For an example of the Illusion-Surprise trope featuring the Ebbinghaus Illusion, see Moore

8. For a discussion of Floating Finger in the contexts of folk illusions and childhood development, see Barker and Rice (2018, pages TK). For a short, historical description of the illusion in the contexts of binocular vision, see Johannsen (1971, 135). For an early psychological description and testament to use of the illusion in classroom settings, see Sharp (1928, 173).

9. For an excellent and accessible introductory text to vision, I recommend Richard L. Gregory's *Eye and Brain: The Psychology of Seeing*, 5<sup>th</sup> ed. ([1966] 2015).

10. For a quick introduction to the philosophical stakes of active versus passive theories of perception, see Gregory (1987: 598-601). For a recent and vividly detailed summary of proprioception studies, see Proske and Gandevia (2012).

In a theoretical framework of active perception, a hypothetical explanation of Falling through the Floor's illusory experience would look something like this: In the multitude of one's past experiences of lying on the floor *without* actively moving one's muscles to lift one's arms, torso, or legs off the floor, one's body remains (as a result of physiology and weight) on the floor. The brain, then, deals with the highly abnormal, kinesthetically passive position of Falling through the Floor's lifting period by erroneously estimating the height that one's playmate has actually lifted one's arms and torso off of the floor. This mis-estimation combined with the slow lowering of the experimenter's torso give rise to the illusion.

### Works Cited

- IllusionWorks. 2004. *Amazing Optical Illusions*. Buffalo: Firefly Books Ltd.
- Barker, K. Brandon and Claiborne Rice. Forthcoming. *Folk Illusions: Children, Folklore, and Sciences of Perception*. Bloomington: Indiana University Press.
- . 2016. Folk Illusions and the Social Activation of Embodiment: Ping Pong, Olive Juice, and Elephant Shoe(s). *Journal of Folklore Research*. 53.2: 63-85.
- . 2012. Folk Illusions: An Unrecognized Genre of Folklore. *Journal of American Folklore*. 125.498: 444-73.
- Baum, Arline and Joseph Baum. 1987. *Opt: An Illusory Tale*. New York: Puffin Books.
- Bauman, Richard. 1982. Ethnography of Children's Folklore. In *Children In and Out of School: Ethnography and Education*, eds. Perry Gilmore and Allan A. Glatthorn. Washington, DC: Center for Applied Linguistics, 172-86.
- Bowman, Paddy and Lynne Hamer. 2011. *Through the Schoolhouse Door: Folklore, Community, Curriculum*. Logan: Utah State University Press.
- Green, Patrick. 1997. *Seeing Is Believing: Activities to Show You How People Think and See*. Parsippany: Julian Messner.
- Gregory, Richard L. [1966] 2015. *Eye and Brain: The Psychology of Seeing*, 5<sup>th</sup> ed. Princeton: Princeton University Press.
- . 1987. Perception. In *The Oxford Companion to Mind*, eds. Richard L. Gregory and O.L. Zangwill. Oxford: Oxford University Press, 598-601.
- Johannsen, Dorothea E. 1971. Early History of Perceptual Illusions. *Journal of the History of the Behavioral Sciences*. 7.2: 127-40.
- Martinez-Conde, Susana and Stephen L. Macknik. 2016. Folk Illusions: What Schoolyard Tricks Reveal about Young Minds. *Scientific American Mind*. 27.5: 18-9.
- Moore, Gareth. 2016. *Brain Benders: Seeing Is Believing*. Minneapolis: Hungry Tomato.
- Proske, Uwe and Simon C. Gandevia. 2012. The Proprioceptive Senses: Their Roles in Signaling Body Shape, Body Position and Movement, and Muscle Force. *Physiological Reviews*. 92.4: 1651-97.
- Rice, Claiborne and K. Brandon Barker. 2017. Folk Illusions: More than Child's Play. *The Psychologist*. 30: 52-4.
- Sharp, W.L. 1928. The Floating-Finger Illusion. *Psychological Review*. 35.2: 71.
- Simon, Seymour. [1976] 1998. *Now You See It, Now You Don't: The Amazing World of Optical Illusions*. New York: Morrow Junior Books.
- Wick, Walter. 1998. *Optical Tricks*. New York: Scholastic Inc.