



April 2, 2007



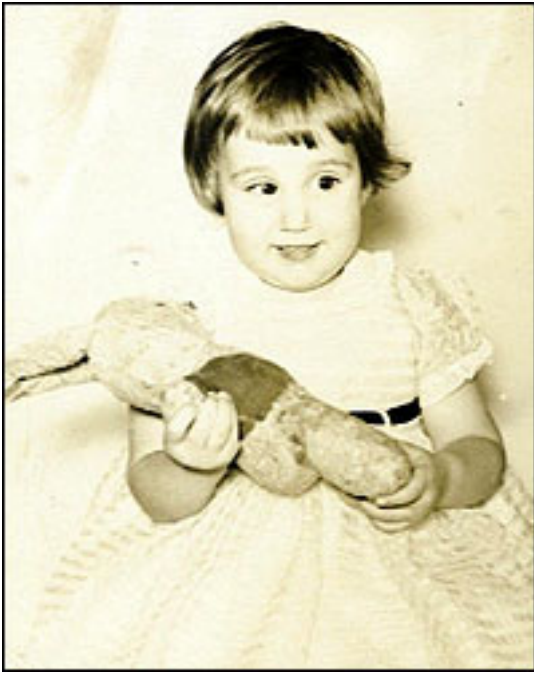
## [Krulwich on Science](#)

By [Robert Krulwich](#)

### Going Binocular: Susan's First Snowfall



A type of physical therapy for the eyes helped to help bring Susan Barry's vision into 3-D some 50 years after her eye surgery. Courtesy the Barry Family



Barry at age 2, before she had an operation to treat her crossed eyes. By the time of her surgery, her brain had already been wired to see in two dimensions instead of three. Courtesy the Barry Family



Barry, left, Dr. Theresa Ruggiero, and Dr. Oliver Sacks in Ruggiero's office in Northampton, Mass. Ruggiero's vision therapy gave Barry normal stereovision for the first time in her life. Courtesy the Barry Family

[Morning Edition](#), June 26, 2006 · This story begins with a chance conversation.

Susan Barry, professor of neuroscience at Mount Holyoke College, was at a party when she happened to bump into Dr. Oliver Sacks.

Sacks is a polymath. He's a physician and an author (*The Man Who Mistook His Wife for a Hat*, and *Awakenings*). His work has been turned into plays (one by Harold Pinter), short stories and movies (Robin Williams played him). He is also a marathon swimmer, a lover of ferns — and, as it happens, he is fascinated by stereoscopy.

Stereopsis is the ability to perceive depth and space. So instead of seeing something as flat, in two dimensions, when you see in stereo you see it in three dimensions. Some people find stereovision completely fascinating. [Just listen to Sacks; he's a stereoscopic nut.](#)

So because Dr. Sacks has this enthusiasm, he was intrigued at the party when Susan Barry mentioned that she had been born cross-eyed.

The problem wasn't surgically treated until she was past her second birthday.

Apparently, that two-year pause was crucial, because when she got to college, Barry learned that if baby cats or baby monkeys are cross-eyed during infancy, their eyes don't learn to work together and therefore their binocular brain cells don't develop and they lose the chance to see in stereo.

The loss is forever, and what happens to baby cats, the professor said, happens to baby humans.

"Like me?" Barry wondered.

She never imagined that she saw differently from other kids. But after the professor raised the question, Barry got herself tested and discovered she was indeed monocular.

She could not see depth or space the way the rest of us do.

All this she told Oliver Sacks. She also told Sacks that she didn't think she was missing very much, not seeing in stereo. And that's when Sacks leaned in really close and said, "Do you think you can imagine what it's like to see the world with two eyes?"

Well, miracles do happen. Barry found out what it's like. And she wasn't imagining.

The rest of the story — the approach of Barry's 50th birthday, Dr. Theresa Ruggiero's exercise regimen and the astonishing moment when against all expectations, Barry's vision suddenly — after a half century — popped into 3-D — you can hear on Morning Edition.

Barry's vision is also the subject of an Oliver Sacks essay in the *New Yorker* magazine.

Barry's experience, it turns out, is not unique. Apparently other people have spent their lives with visual deficits expected to last forever and, through various therapies suggested by their eye doctors, they say they have gotten

back some of the sense they had lost.

For more examples, [see www.visionstories.org](http://www.visionstories.org).

What is especially fascinating about all these stories is they suggest that brains are more "plastic" — more changeable and repairable in adulthood — than many scientists and doctors had thought.

For a long time, leading neuroscientists taught that there is a brief "critical period" in infancy when a baby brain can rewire itself and change; when that period ends, change stops.

It would follow that if you are born cross-eyed and do nothing about it until you are 2 years old, you can never learn to see in stereo. Barry's story (and the others if they prove to be true) suggest that while baby brains are more malleable than adult brains, adult brains are not frozen in place.

They can change. Barry's did.

## Related NPR Stories

- June 12, 2006  
[How a Man, a Rat and a Spider Learned to Fly](#)