

# Developmental psychologist explains her life's work studying the mysteries of the mind

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Developmental psychologist Daphne Maurer has spent more than four decades studying the complexities of the human mind.

As the director of the Visual Development Lab at McMaster University and president of the International Society on Infant Studies, Maurer will present her life's work at the Biennial International Conference on Infant Studies in Berlin July 4th.

Over the course of her career she has established a reputation for building new understanding of one of the most challenging and mysterious aspects of [human development](#): how our senses work.

This work includes 30 years she has spent as an investigator on a longitudinal study following the visual development of infants born with cataracts in both eyes.

"We know that babies' brains are highly plastic, or flexible, when they are born and get tuned to the environment to which they are exposed," explains Maurer.

"So a baby is learning 'my people look like that, my people talk like that, my people eat this kind of food'. The brain begins with an exuberance of connections which are then pruned to match their environment," she says.

Researchers have discovered, however, that babies who experience a period of temporary blindness early in life do not go on to process the same [sensory information](#) other infants might. While they undergo corrective surgery in the first months of their lives, these children grow up to have impaired vision. Even missing just the first month or two of vision leads to profound visual deficits that are carried into adulthood.

"We already know adult brains are far less plastic but the challenge is to unlock plasticity when it is needed most, for example when a [traumatic brain injury](#) occurs," she explains.

And the remedy, as she has found in related research, might lie in an unlikely source: video games.

Maurer's findings that 'first-person shooter' games can actually improve eyesight in adults born with cataracts made international headlines in 2012 when she discovered study participants who had played a total of 40 hours (10 hours per week) of the first-person shooter game Medal of Honor, showed some improvement in their vision.

"This research is really promising," says Maurer. "We think the game promotes [brain plasticity](#) because it forces players to monitor the action from all sides and act on what they see. The results of our work suggest participants can retrain their range of vision and overcome sensory deficiencies."

Maurer's lab is further testing brain plasticity involving adults who have synesthesia, a neurological condition where the senses blend together. In one form, an individual might hear a colour. In another, letters of the alphabet might appear in different colours. For example, the letter 'A' might be red, or the letter 'C' yellow.

Maurer believes that individuals with synesthesia could provide clues

about the development of perception and language.

"Studies suggest that the brains of people who have synesthesia remain in a slightly less specialized state because the pruning that happens early on is incomplete. It seems to be the case that babies and toddlers are slightly synesthetic when they start out and I think there is underground synesthesia in all of us," she says.

Maurer's current work is focusing on how to correct sensory deficits in adults by exploiting residual plasticity involving interaction among the senses. That is, can hearing or touch teach vision to decode the world more accurately, as it does in adults without sensory deficits? Or is this implicit learning process also impaired?

**More information:**

[www.isisweb.org/view/0/ISISconference2014.html](http://www.isisweb.org/view/0/ISISconference2014.html)

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