

Human Development, Health, Neuroscience

## Motherhood might actually improve memory

By Laura Sanders 11:21am, December 21, 2016



Pregnancy and parenthood can reshape mothers' brains. Those changes might be a good thing, some research suggests.

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You may have read the news this week that pregnancy shrinks a mother's brain. As a mom-to-be's midsection balloons, areas of her cerebral cortex wither, scientists reported online December 19 in *Nature Neuroscience*.

Yes, that sounds bad. But don't fret. As I learned in reporting that story, a smaller brain can be more efficient and specialized. In fact, post-pregnancy brains could be considered evolutionary works of art, perfectly sculpted to better respond to their babies. The researchers found that the brain regions most changed during pregnancy are the ones that fire up when mothers see pictures of their babies. Pregnancy (and possibly childbirth) may make these neural networks sleeker and stronger, helping moms to tune in to their infants.

As someone whose brain has shriveled at least one time, maybe twice (scientists don't know if the brain keeps getting smaller with subsequent pregnancies), I find it fascinating to think about this remodeling. The lingering question, however, is whether those brain changes relate to a mother's smarts. The world abounds with anecdotal attacks of baby brain and placenta dementia (a name that both entertains and offends me), but are the conditions real? Do pregnant women and new moms really turn into forgetful, bumbling idiots?

Study coauthor Elseline Hoekzema, a neuroscientist at Leiden University in the Netherlands, says that the data on this are fuzzy. "It is not well-established whether there are objective changes in memory as a result of pregnancy," she says. Some studies find effects, while others find none. Research round-ups indicate that certain kinds of memory may be affected, leaving others unscathed. In their study of 25 first-time mothers, Hoekzema and her colleagues didn't find any memory changes from pre-pregnancy to the months after they gave birth. This study didn't test the women while they were pregnant, though.

But there are signs of memory slips during pregnancy and the immediate aftermath in both people and animals, says neuroscientist Liisa Galea of the University of British Columbia in Vancouver. Those results vary depending on trimester, fetal sex and other factors, she says. My first thought on hearing those results was, “of *course*.” Anyone forced to sleep in two-hour increments for months at a time will have trouble remembering things. But Galea says that extreme exhaustion can’t account for the deficits.

Lest mothers despair, Galea pointed me to some different research by her and others that indicates after this early rough spell, motherhood may actually make the brain stronger. In a maze test, first-time rat mothers that were no longer nursing their babies actually outperformed rats that had never given birth. And rats that had been pregnant multiple times outperformed non-mother rats on a different memory test, Galea says.

What’s more, motherhood may help keep the brain young. When tested at the ripe old age of 24 months, rats that had given birth earlier in life performed better on tests of learning and memory than rats that had not given birth. Those results suggest that something about motherhood — perhaps the stew of hormones and the brain changes that follow — may actually protect the brain as it ages.

Despite the spotty scientific literature on these sorts of changes in women, Galea thinks the evidence suggests that there’s a temporary dip in memory during pregnancy and the early postpartum period, followed by not just a recovery, but an actual improvement. “Pregnancy and motherhood are dramatic life-changing events that can have long-lasting repercussions in the brain,” she says. And it’s quite likely that some of those repercussions might be good.

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