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At six months of age, babies might not know how to express themselves through language, but they have an innate knack for numbers, a new study suggests.

Even at 6 months, babies have innate sense of numbers: study

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At six months of age, babies might not know how to express themselves through language, but it turns out they have an innate knack for numbers, a new study suggests.

Researchers at John Hopkins University found that infants were able to recognize whether the number of happy faces shown on a computer screen matched or mismatched a number of sound tones played to the infants just before they were shown the images.

In one experiment, babies were played four sound tones and then shown four happy faces on a computer screen. The procedure was then repeated, but instead of four happy faces appearing on screen, which would have corresponded to the number of beeps, the researchers showed the babies eight happy faces.

“What we found was that babies looked significantly longer at the mismatch, as though they were surprised, as though they were expecting to see four things because they had just heard four sounds,”

said [Lisa Feigenson](#), a professor of psychological and brain sciences at John Hopkins University and lead author of the study.

Researchers conducted experiments with 24 babies, all of whom were within about one week of being six months old. Feigenson said the age limit was imposed partly to control for linguistic development, which would be more advanced in older infants.

“Many one-year-olds, for example, have begun to talk and their parents have already engaged in counting sequences with them, whereas six-month-olds have very little number-relevant input,” she told the *Star*. “They aren’t producing words and yet they can control their eye movements in this kind of test. Their eye movements can give us a window into what’s going on in their minds.”

The results suggest that infants are able to perform rapid estimations akin to adults who view two checkout lines at a grocery store before deciding which one to join.

“When I take a quick look at lineups in the grocery store, I don’t count how many people are lining up, but I get a gut sense of the number. That’s what babies are doing,” Feigenson said. “They have not yet learned to count, they cannot represent numbers precisely, but they can form these gut, intuitive numerical estimations.”

But there are limits to this ability. The researchers found that unless the number of happy faces was at least twice as large as the number of sound tones the babies heard, the infants could not distinguish the numerical difference. Such results show that our innate numerical abilities are approximate, Feigenson said.

The ultimate goal of the experiments, she said, is to determine if this early ability to recognize numerical differences is the foundation of human mathematical abilities. If future research is able to pinpoint just how fine an approximation babies can recognize, such a discovery could have applications for designing educational curricula or helping to understand what causes dyscalculia, an inability to understand simple mathematics.

The study is published online in the [Journal of Experimental Child Psychology](#).