



**X) LEER EL SIGUIENTE TEXTO Y CONTESTAR LAS PREGUNTAS ELIGIENDO UNA OPCIÓN**

## The first year of life

***A message from Life co-author, Helen Stephenson***

*Anyone with experience of babies knows how quickly they develop. When you only see a baby once in a while, it's incredible how much they have learned to do. I'd love to understand more about how a baby's brain works, and what they are thinking*

A study into child development published in 2010 was one of the first to demonstrate that childhood experience influences the structure of the developing brain. Since then, other studies have shown a link between a baby's socioeconomic status and the growth of its brain. Despite millennia of child rearing, we have only a limited understanding of how babies take such gigantic strides in cognitive, linguistic, reasoning and planning ability. At birth, the brain has nearly a hundred billion neurons, as many as in adulthood. As the baby grows, receiving a flood of input through their senses, neurons get connected to other neurons, resulting in some hundred trillion connections by the age of three.

Using new technology, scientists can better understand the mystery of how a child goes from being barely able to see when just born to being able to talk, ride a bike, draw, and invent an imaginary friend by the age of five. The more scientists find out about how children acquire the capacity for language, numbers and emotional understanding during this period, the more they realise that the baby brain is an incredible learning machine. Its future—to a great extent—is in our hands.

Judit Gervain, a cognitive neuroscientist at Paris Descartes University, tested how good newborns are at distinguishing different sound patterns. Using near-infrared spectroscopy, the researchers produced images of the brains of babies as they heard audio sequences. In some, the sounds were repeated in an ABB structure, such as mu-ba-ba; in others, an ABC structure, such as mu-ba-ge. The researchers found that brain regions responsible for speech and audio processing responded more strongly to the ABB sequences. In a later study, they found that the newborn brain was also able to distinguish between audio sequences with an AAB pattern and those with an ABB pattern. Not only could babies notice repetition, they also were sensitive to where it occurred in the sequence. Gervain is excited by these findings because the order of sounds is the building block of words and grammar. 'Position is key to language,' she says. 'If something is at the beginning or at the end, it makes a big difference: "John killed the bear" is very different from "The bear killed John."'

Elsewhere, researchers led by Patricia Kuhl, a neuroscientist at the University of Washington in Seattle, have found that language delivered by television, audio book, internet, or smartphone — no matter how educational — doesn't appear to be enough for children's development. They carried out a study of nine-month-old American babies. The researchers expected the group who'd watched videos in Mandarin Chinese to show the same kind of learning as the group who were face-to-face with the same sounds. Instead they found a huge difference. The babies exposed to the language through human interactions were able to distinguish between similar Mandarin sounds as well as native listeners. But the other babies — regardless of whether they had watched the video or listened to the audio — showed no learning whatsoever.

'We were blown away,' Kuhl says. 'It changed our fundamental thinking about the brain.' The result of this and other studies led Kuhl to propose that social experience is necessary for linguistic, cognitive, and emotional development.



**1. According to the article...**

- A. current theories about child development are incorrect.
- B. scientists are now able to confirm their ideas about the development of a baby's brain.
- C. we are only just starting to understand clearly how babies' brains develop.

**2. According to the article, which statement is true?**

- A. Babies who interact with technology develop more quickly.
- B. Information technology is useful for a child's brain development.
- C. Technology is an important tool for brain research.

**3. Which statement is supported by the article?**

- A. Babies' brains are programmed to develop in the same way.
- B. Early exposure to language promotes brain development.
- C. We can influence the way a child's brain develops.

**4. According to the first paragraph,...**

- A. in recent years, we have been able to discover the size of a newborn's brain.
- B. today's babies develop more quickly than in previous millennia.
- C. until a few years ago, the link between experiences and brain growth wasn't known.

**5. A newborn baby's brain...**

- A. has a similar number of neurons to an adult's.
- B. has far fewer neurons than an adult's.
- C. has many more neurons than an adult's.

**6. Which statement is implied by the second paragraph?**

- A. Baby's brains use the same mechanisms as machines.
- B. Scientists are close to understanding how a child's brain learns.
- C. The ability to invent an imaginary friend is an indicator of brain development.

**7. Which statement is true?**

- A. Audio processing is not well developed in newborn babies.
- B. Babies' brains recognise different sound patterns.
- C. Judit Gervain discovered the region of the brain used to process speech.

**8. Why is Judit Gervain's study interesting?**

- A. It demonstrates that babies understand different words.
- B. It shows that babies can begin to understand grammar.
- C. It suggests that word order is relevant to meaning.

**9. What did Patricia Kuhl's study focus on?**

- A. the effect of social interaction on learning
- B. the importance of exposing babies to language from many sources
- C. the way different languages are processed by babies

**10. What is the main conclusion from Kuhl's study?**

- A. Babies shouldn't watch a lot of television.
- B. Brain development is improved by interacting with people.
- C. Foreign languages help a baby's brain develop.