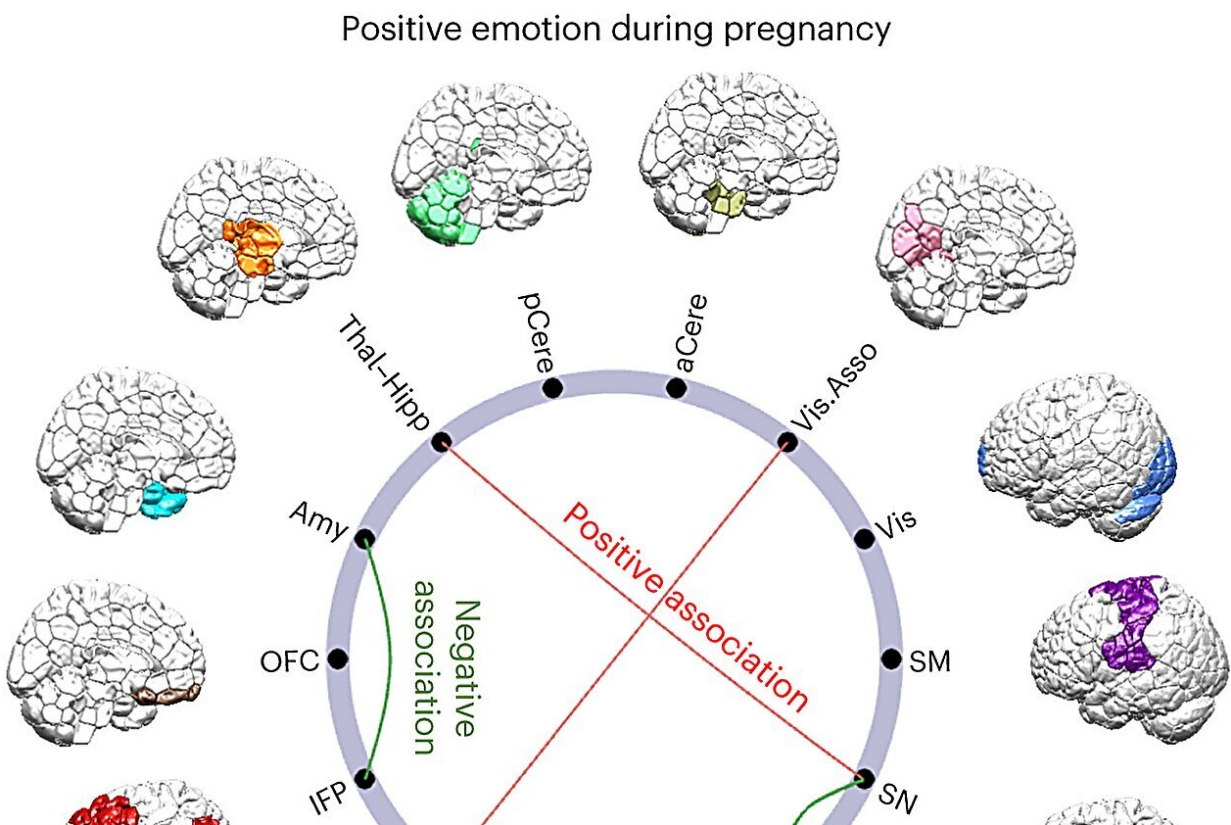


# Study confirms maternal positive mental health correlated to children's brain development

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Functional connectivity in relation to maternal positive emotion. Credit: *Nature Mental Health* (2024). DOI: 10.1038/s44220-024-00202-8

Pregnancy brings about profound changes, and nurturing positive mental

health during this period is crucial for the long-term health and well-being of children. Through scientific investigations on young children, Prof. Qiu Anqi, Professor of the Department of Health Technology and Informatics and Global Stem Scholar at The Hong Kong Polytechnic University (PolyU), along with her research group, has validated the impact of maternal positive emotions on children's brain development and function.

According to the research conducted by Prof. Qiu, girls born to mothers who reported experiencing greater positive mental health during pregnancy showed larger bilateral hippocampi. Increased hippocampal volume is directly related with improvements in memory performance.

Significantly, children of mothers with higher levels of maternal positive mental health demonstrated altered [functional connectivity](#) within several [neural networks](#), including the default mode, salience, executive control, amygdala and thalamo-hippocampal networks. These networks link to a wide range of cognitive, emotional, memory-related [brain development](#) and functions.

Maternal positive mental health has long-lasting impacts on the brain development of offspring. These impacts are especially pronounced in the brain structures such as the hippocampus and amygdala, as well as functional networks such as the visual, default mode and frontal networks, which are integral to emotion perception and regulation.

Prof. Qiu said, "The research findings extend the study of maternal mental health beyond maternal psychopathology, suggesting the importance of promoting positive maternal mental health during pregnancy as a potential protective factor for children's brain development."

The research provided new evidence that improved maternal positive

emotion during pregnancy has the potential to promote the hippocampal development of children. Therefore, maternal positive emotion significantly influences the quality of parenting relationship after delivery, including greater material sensitivity, warmth and responsiveness to the child's needs, as well as enhanced infant socioeconomic development.

The study used a longitudinal dataset to investigate how [positive emotions](#) experienced by mothers during pregnancy affect the brain structure and function of 7.5 year-old children. Both structural and [functional magnetic resonance](#) imaging (MRI) were used in the study involving 381 Asian participants in Singapore. The research titled "Maternal positive mental health during pregnancy impacts the hippocampus and functional brain networks in [children](#)" was [published](#) in *Nature Mental Health*.

A measure of positive maternal mental health, which includes positive effects and emotional well-being during pregnancy, was developed through confirmatory factor analysis of questionnaires administered at 26–28 weeks. The study findings highlight the importance of delving into a broader spectrum of mental health aspects beyond just illness, advocating for positive emotions among mothers.

"Our research further confirmed the importance of positive mental health and well-being during [pregnancy](#), which is also a key determinant in child brain development," said Prof. Qiu. Her research areas focus on brain development and the use of artificial intelligence to predict and analyze mental health issues in young people.

**More information:** Anqi Qiu et al, Maternal positive mental health during pregnancy impacts the hippocampus and functional brain networks in children, *Nature Mental Health* (2024). [DOI: 10.1038/s44220-024-00202-8](https://doi.org/10.1038/s44220-024-00202-8)

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