In Co-Parenting, Spousal Presence Affects Brain Chemistry

By **Traci Pedersen**
Associate News Editor

Last updated: 18 May 2020
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A new study reveals how the physical presence of spouses who are co-parenting can alter one another's brain activity.

Researchers from Nanyang Technological University, Singapore (NTU Singapore) analyzed how the brain activity of 24 husband-wife pairs from Singapore changed in response to recordings of infant stimuli such as crying, when they were physically together and when they were apart.

For the study, the researchers monitored the parents' prefrontal cortex — a brain region linked to complex behavior and emotional states — with functional Near-infrared Spectroscopy (fNIRS), a non-invasive optical imaging technique that measures brain signals based on the level of oxygenated and deoxygenated blood in the brain.

Before the experiment, couples answered a questionnaire that aims to measure how often the mother or father takes the lead in co-parenting. The couples were then exposed to infant and adult laughter and cries, as well as a static sound either together (in the same room at the same time) or separately (in different rooms at different times).

The results reveal that when the spouses were physically together, their brains showed more similar responses than when they were apart. This effect was only found in true couples and not in randomly matched study participants.

When similar brain activity in the same area of the brain (i.e. greater synchrony) is observed in two people, it suggests that both are highly attuned to each other's emotions and behaviors.

"Our study indicates that when spouses are physically together, there is greater synchrony in their attentional and cognitive control mechanisms when parenting," said senior author NTU Associate Professor Gianluca Esposito, who holds a joint appointment in the School of Social Sciences and the Lee Kong Chian School of Medicine.

"Since the brain response of parents may be shaped by the presence of the spouse, then it is likely that spouses who do not spend much time together while attending their children may find it harder to understand each other's viewpoint and have reduced ability to coordinate co-parenting responsibilities. This may undermine the quality of parental care in the long run."

Esposito, who also leads the Social and Affective Neuroscience Lab (SAN-Lab) at NTU, said more time together while caring for a child may seem like a "waste of time." However, it may prove to help the couple with parenting.

"This finding is particularly useful for parents who are working from home during this "circuit breaker" period in Singapore — as families spend more time together at home as part of social distancing measures in the fight against COVID-19. The entire family interacting together for an extended period may be stressful, but parents can take this time to tune into each other's behaviour and emotions while caring for their children."

The study, undertaken in collaboration with researchers from the United States' National Institute of Child Health and Human Development and Italy's University of Trento, was published in *Nature Scientific Reports*.

"Our study brings us a step closer in uncovering how the parental brain may be shaped by the physical presence of the co-parenting spousal partner," said first author Ms. Atiqah Azhari, an NTU PhD candidate at the SAN-Lab.

"To ascertain how synchrony may be beneficial or not for the couple or child, future research should look into how synchrony during positive and negative emotional situations directly affects coordinated caregiving behaviours."

The paper's co-first author Ms Mengyu Lim, who is a Project Officer at the SAN-Lab at NTU, said, "The findings of this study may be empowering for

those who experience parenting stress — that we should not think of parenting as an individual task, but a shared responsibility with the spouse. Co-parenting requires active teamwork, communication, and trust in each other."

The study builds on Esposito's previous research on the effects of parenting stress in the brains of both mothers and their children.

Source: Nanyang Technological University