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Mothers with Higher Empathy Have Children Who Make Moral Decisions and Exhibit Higher Ventromedial Prefrontal Cortex (vmPFC) Activity During Joint Book Viewing: An fNIRS Hyperscanning Study from Singapore

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ABSTRACT

Parents' empathic responses are crucial in shaping children's attitudes and moral development. Empathy triggers positive emotional responses, which facilitate adaptive judgment and utilitarian decisions. However, no study has examined the role of parental empathy in influencing children's moral reasoning and their underlying neural responses. In this study, we explored the dyadic mother-child perspective by investigating the association between mothers' empathy levels and children's moral decisions and brain activity in the prefrontal cortex (PFC). Mother-child dyads wore a 20-channel functional Near-Infrared Spectroscopy (fNIRS) cap with a standard PFC montage while viewing and discussing three preschool-aged stories: (1) Chinese New Year celebrations (in-group), (2) Deepavali celebrations (out-group) and (3) a multicultural condition in a neighbourhood setting. We measured 19 mothers' empathy levels using the Toronto Empathy Questionnaire and their 3-to-7-year-old children's empathic tendencies by inviting mothers to ask their children whether they would help the characters of these stories with simple chores in hypothetical scenarios. Findings showed that children are disposed to behave in ways parallel to their mother's attitudes. Empathetic mothers have children who make prosocial decisions rooted in empathic concern. These helpful children also have higher activations in the ventromedial prefrontal cortex (vmPFC), the brain area associated with ethical decision-making. This study highlights the influence of parent-child communication in strengthening children's moral knowledge and moral emotions and emphasises that parents' attitudes and interactions play a significant role in children's decision-making abilities.

Keywords: empathy; decision-making; neuroscience; parent-child interactions; ventromedial prefrontal cortex