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Parenting is Associated with Delta-Beta Coupling in Preschoolers

Parenting behaviors serve as early influences on children's developing regulatory capacities (Kopp, 1982). Sensitive parenting, or parents' ability to correctly interpret and respond to children's signals is believed to support the development of regulation. In contrast, harsh parenting, or uninvolved, or punitive parent behaviors, is thought to diminish regulatory development (Ainsworth et al., 1974). Delta-beta coupling is believed to index functional crosstalk between cortical and subcortical systems of the brain (Knyazev, 2007). Though coupling has been studied as an index of neural systems of regulation in children, it is unclear whether parenting impacts coupling in ways that are consistent with developmental theory. Thus, we tested associations between parenting behaviors and delta-beta coupling as regulatory systems are developing. Using a measure of resting EEG, we found that preschoolers ($N=91$, $M_{age}=3.60$, $SD=0.15$) with fathers low (vs. high) in harsh parenting showed greater coupling in parietal electrode sites ($z=2.66$, $p=0.00$) while fathers' high (vs. low) harsh parenting was linked to greater coupling in frontal electrode sites ($z=-2.14$, $p=0.02$). There were no significant findings in mothers ($z < 1.36$). Heightened coupling was also seen at frontal sites for preschoolers who were high (vs. low) in social fear ($z=-2.11$, $p=0.02$), suggesting that enhanced early coupling in frontal regions may expedite the development of frontal regulatory networks in order to cope with negative parenting and may serve as proxy of regulation-based risk for anxiety problems in young children.