MedicalXpress

Hush little baby... Linking genes, brain and behavior in children

July 13 2009

It comes as no surprise that some babies are more difficult to soothe than others but frustrated parents may be relieved to know that this is not necessarily an indication of their parenting skills. According to a new report in *Psychological Science*, a journal of the Association for Psychological Science, children's temperament may be due in part to a combination of a certain gene and a specific pattern of brain activity.

The pattern of brain activity in the frontal cortex of the brain has been associated with various types of temperament in children. For example, infants who have more activity in the left frontal cortex are characterized as temperamentally "easy" and are easily calmed down. Conversely, infants with greater activity in the right half of the frontal cortex are temperamentally "negative" and are easily distressed and more difficult to soothe.

In this study, Louis Schmidt from McMaster University and his colleagues investigated the interaction between brain activity and the DRD4 gene to see if it predicted children's temperament. In a number of previous studies, the longer version (or allele) of this gene had been linked to increased sensory responsiveness, risk-seeking behavior, and attention problems in children. In the present study, brain activity was measured in 9-month-old infants via electroencephalography (EEG) recordings. When the children were 48 months old, their mothers completed questionnaires regarding their behavior and DNA samples were taken from the children for analysis of the DRD4 gene.

The results reveal interesting relations among brain activity, behavior, and the DRD4 gene. Among children who exhibited more activity in the left frontal cortex at 9 months, those who had the long version of the DRD4 gene were more soothable at 48 months than those who possessed the shorter version of the gene. However, the children with the long version of the DRD4 gene who had more activity in the right frontal cortex were the least soothable and exhibited more attention problems compared to the other children.

These findings indicate that the long version of the DRD4 gene may act as a moderator of children's temperament. The authors note that the "results suggest that it is possible that the DRD4 long allele plays different roles (for better and for worse) in child temperament" depending on internal conditions (the environment inside their bodies) and conclude that the pattern of brain activity (that is, greater activation in left or right frontal cortex) may influence whether this gene is a protective factor or a risk factor for soothability and attention problems. The authors cautioned that there are likely other factors that interact with these two measures in predicting children's temperament.

Source: Association for Psychological Science (news : web)