

How the brain repairs stuttering

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Stuttering is a neurodevelopmental disorder associated with left inferior frontal structural anomalies. While children often recover, stuttering may also spontaneously disappear much later after years of dysfluency. These rare cases of unassisted recovery in adulthood provide a model of optimal brain repair outside the classical windows of developmental plasticity.

Here we explore what distinguishes this type of recovery from less optimal repair modes, i.e. therapy-induced assisted recovery and attempted compensation in subjects who are still affected. We show that persistent stuttering is associated with mobilization of brain regions contralateral to the structural anomalies for compensation attempt. In contrast, the only neural landmark of optimal repair is activation of the left BA 47/12 in the orbitofrontal cortex, adjacent to a region where a white matter anomaly is observed in persistent stutterers, but normalized in recovered subjects. These findings show that late repair of neurodevelopmental stuttering follows the principles of contralateral and perianomalous reorganization.