

Dynamic Field Theory of Executive Function: Identifying Early Neurocognitive Markers

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Executive function (EF) refers to a set of skills including working memory, inhibition, and shifting. More so than measures like IQ, EF ability in early childhood predicts both academic and quality of life outcomes in adulthood. Thus, it is critical to identify mechanisms of EF development. We framed the current study around a dynamic field theory that explains EF development through neural population interactions. Our results showed that labeling ability at 30 months is a better predictor of EF at 54 months than other tasks typically used to assess early EF ability. Functional near infra-red spectroscopy analysis revealed left inferior frontal cortex activation during labeling tasks that predicted later EF performance. These results suggest that label learning is a mechanism to strengthen EF.