Heterogeneity in development of aspects of working memory predicts longitudinal attention deficit hyperactivity disorder symptom change.

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Abstract

The role of cognitive mechanisms in the clinical course of neurodevelopmental disorders is poorly understood. Attention Deficit Hyperactivity Disorder (ADHD) is emblematic in that numerous alterations in cognitive development are apparent, yet how they relate to changes in symptom expression with age is unclear. To resolve the role of cognitive mechanisms in ADHD, a developmental perspective that takes into account expected within-group heterogeneity is needed.

METHOD:
The current study uses an accelerated longitudinal design and latent trajectory growth mixture models in a sample of children ages 7-13 years carefully characterized as with (n = 437) and without (n = 297) ADHD to (a) identify heterogeneous developmental trajectories for response inhibition, visual spatial working memory maintenance, and delayed reward discounting and (b) to assess the relationships between these cognitive trajectories and ADHD symptom change.

RESULTS:
Best-fitting models indicated multiple trajectory classes in both the ADHD and typically developing samples, as well as distinct relationships between each cognitive process and ADHD symptom change. Developmental change in response inhibition and delayed reward discounting were unrelated to ADHD symptom change, while individual differences in the rate of visual spatial working memory maintenance improvement predicted symptom remission in ADHD.

CONCLUSION:
Characterizing heterogeneity in cognitive development will be crucial for clarifying mechanisms of symptom persistence and recovery. Results here suggest working memory maintenance may be uniquely related to ADHD symptom improvement.