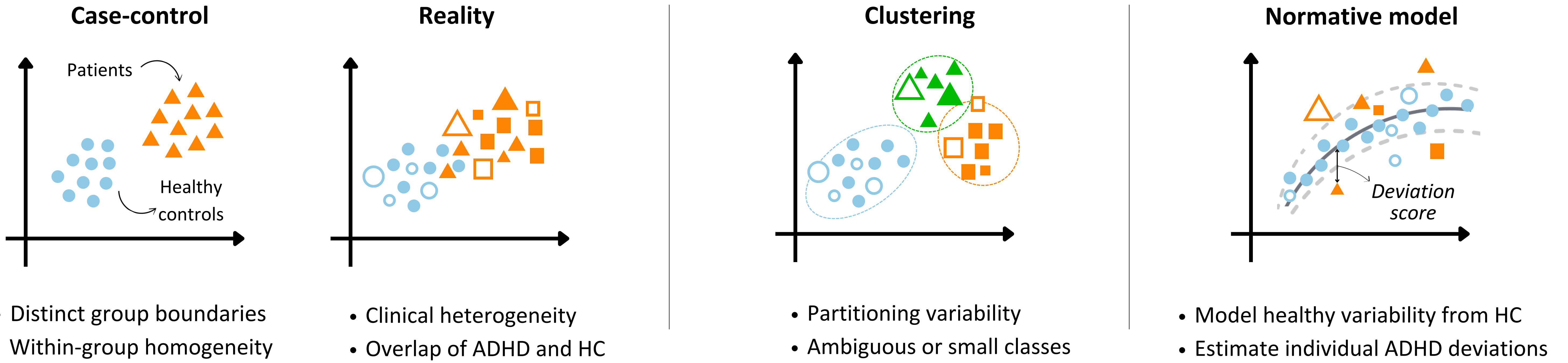


Individualized EEG Deviations Identify Neurophysiological Subtypes of ADHD

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Context

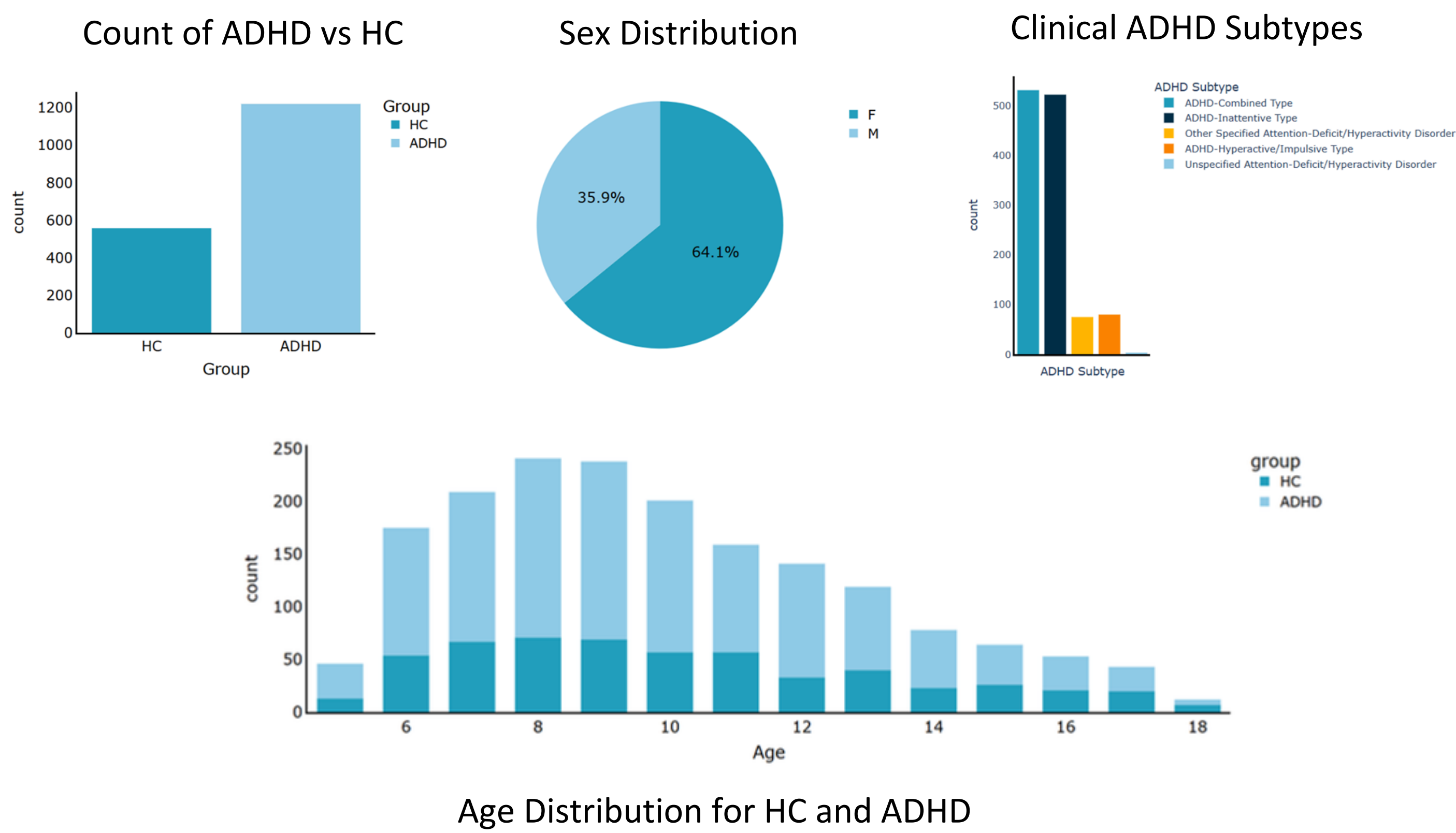


Objectives

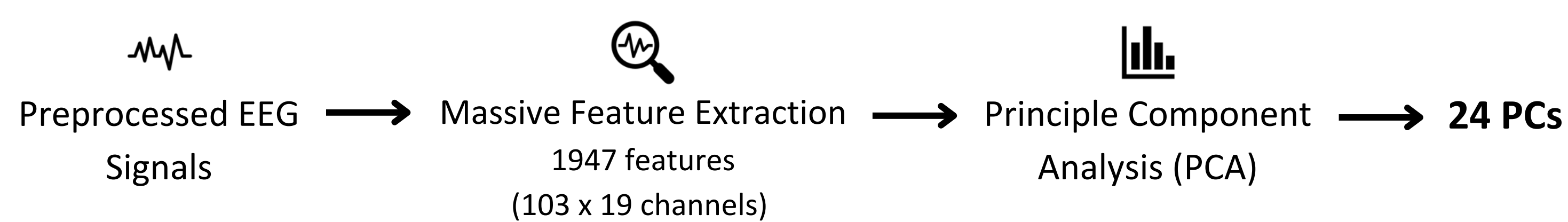
- Characterize individualized EEG deviations in ADHD using normative modeling
- Determine whether EEG deviation profiles reveal biologically meaningful subtypes associated with distinct behavioral characteristics

Methods

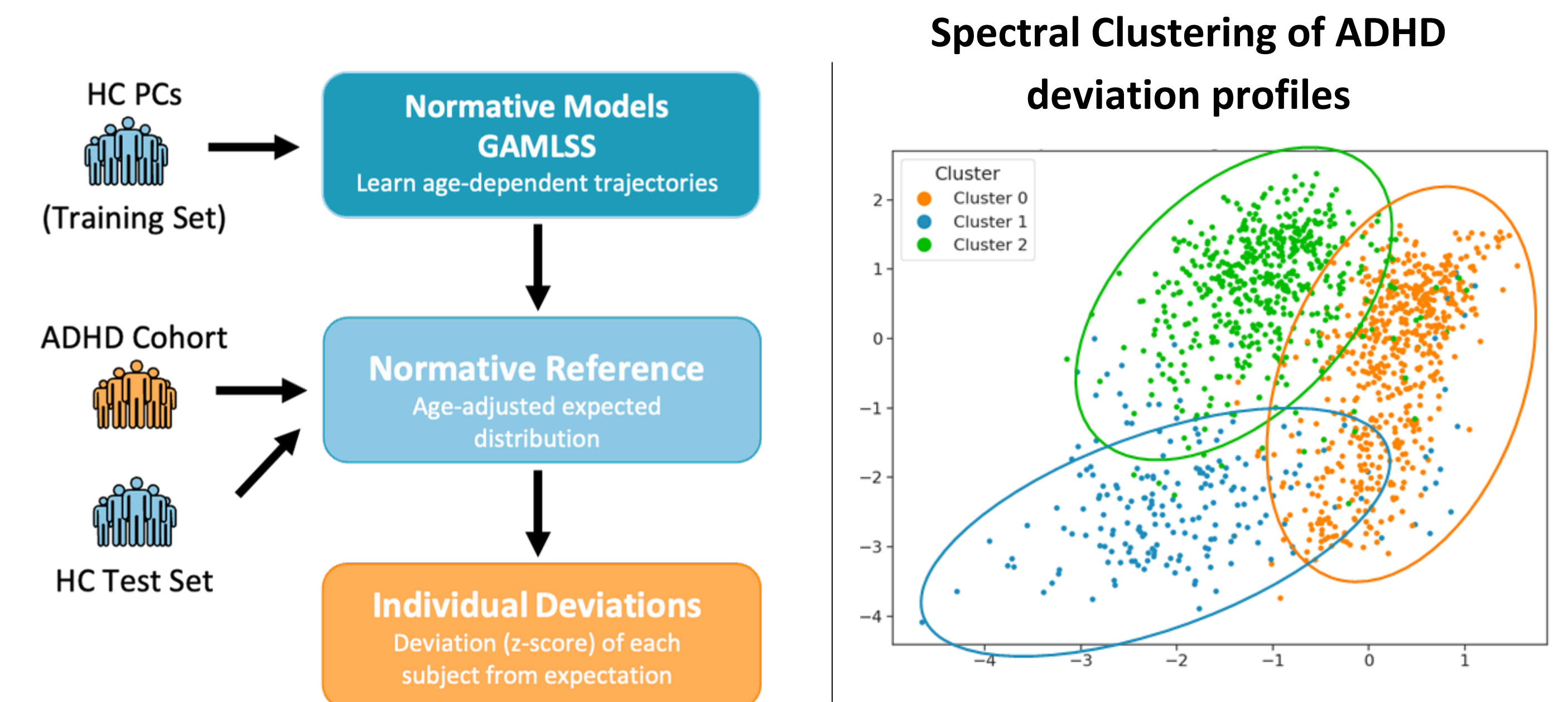
I. Cohort Characteristics



II. EEG Feature Extraction Pipeline



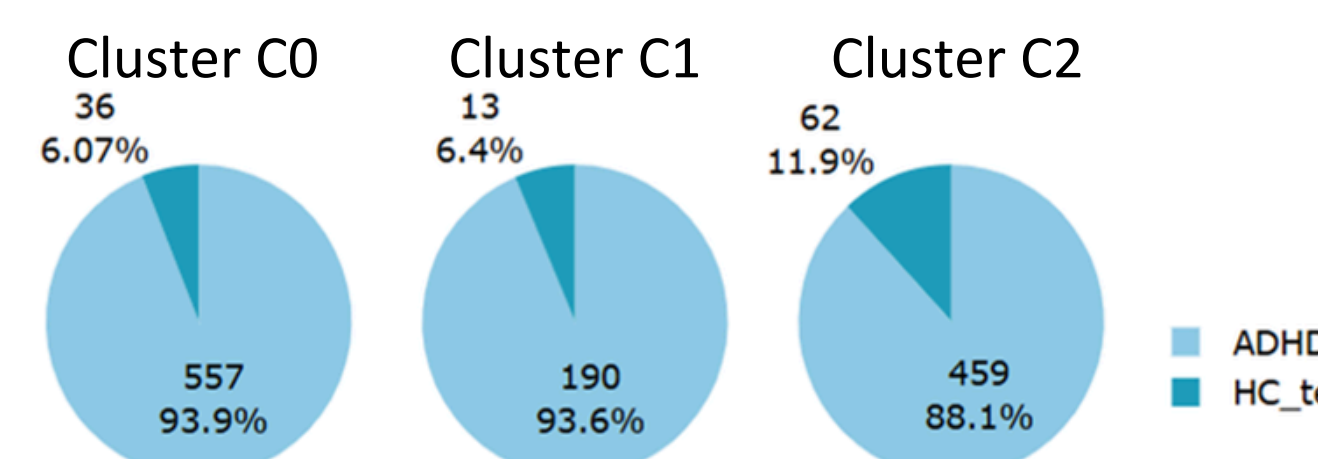
III. Normative Modeling and EEG Deviation Profiling



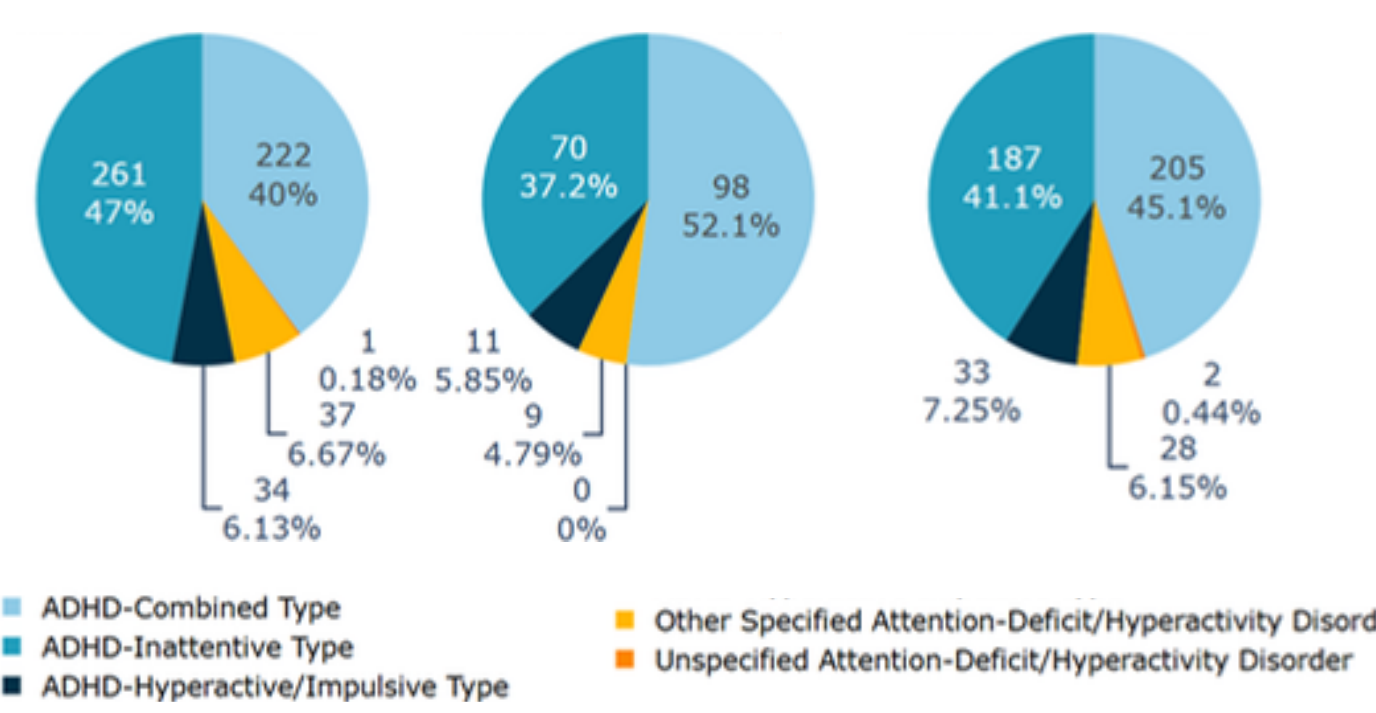
Results

Diagnostic Distribution Across Clusters

ADHD vs HC Composition Across Clusters

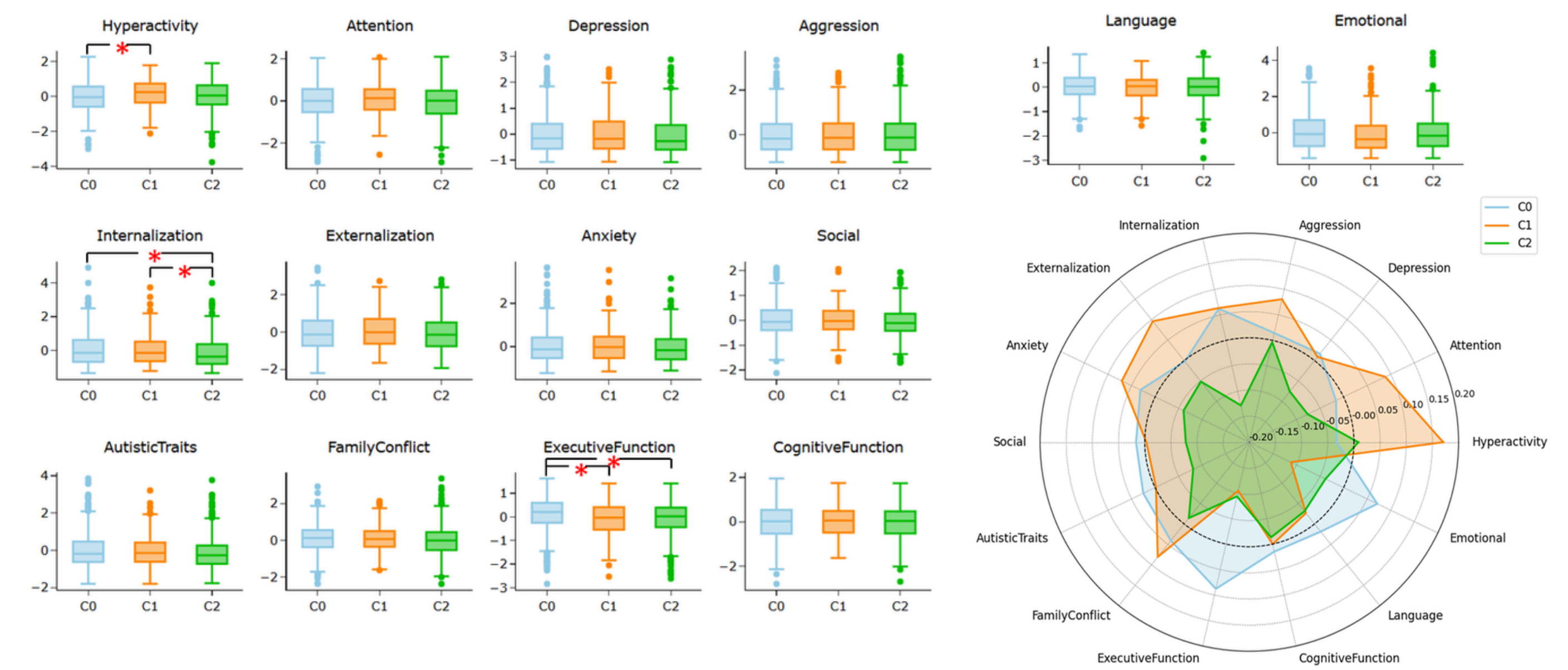


Clinical ADHD Subtypes Within Clusters

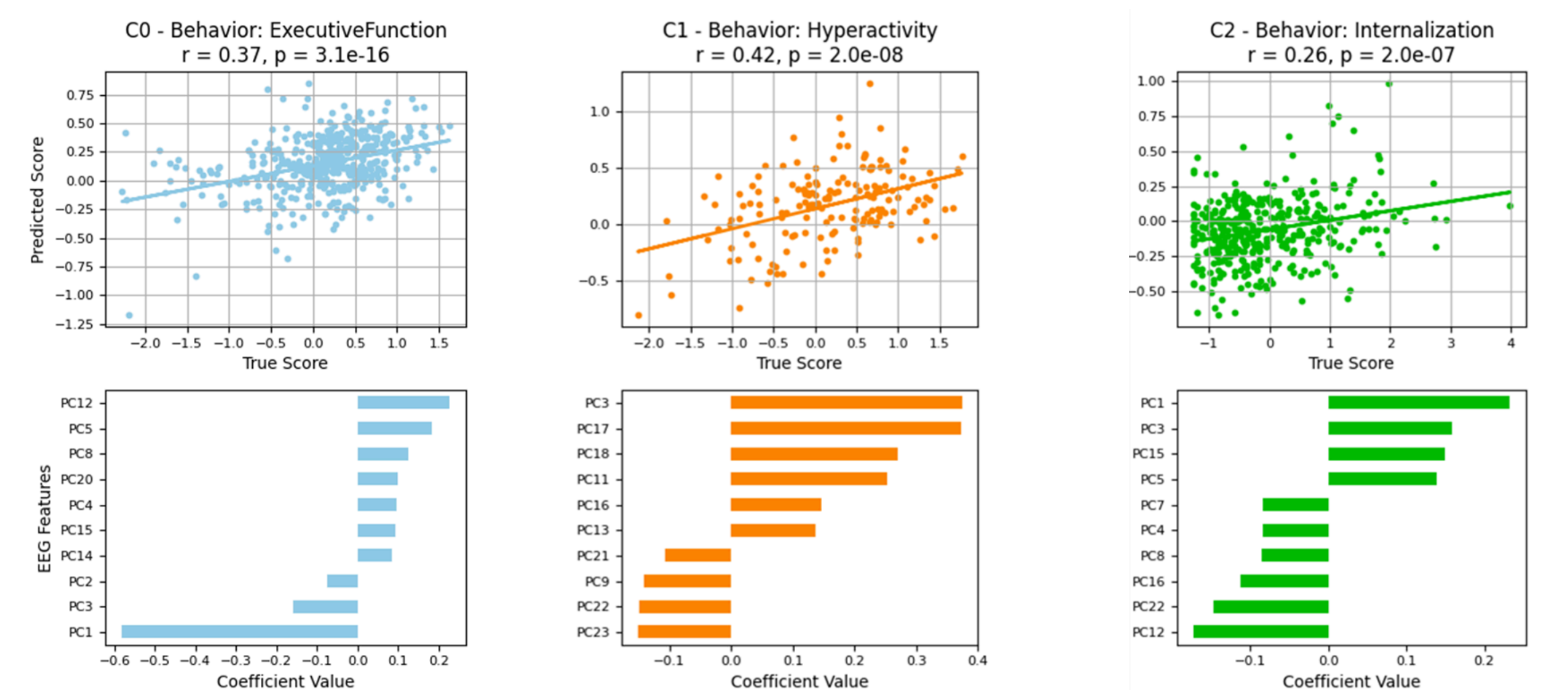


- Three EEG-derived neurophysiological subtypes were identified
- Cluster membership was partially explained by ADHD diagnosis and clinical subtype, with HCs present across all clusters
- EEG-derived subtypes showed distinct behavioral characteristics
- EEG deviation profiles predicted key behavioral dimensions within each subtype
- EEG-defined subgroups transcended traditional ADHD presentations

Behavioral Profiles of EEG-Derived Subtypes



Prediction of Behavioral Traits from EEG Deviations



Take-Home Messages

- Individualized EEG deviations move beyond group-average analyses
- EEG deviation profiles reveal biologically informed ADHD subtypes
- Neurophysiological subtypes transcend traditional ADHD classifications
- EEG-derived subtypes are associated with distinct behavioral characteristics

References

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- Tabbal, Judie, et al. "Characterizing the heterogeneity of neurodegenerative diseases through EEG normative modeling." *npj Parkinson's Disease* 11.1 (2025): 117
- Tabbal, Judie, et al. "Transdiagnostic electrophysiological subtypes reveal brain-behavior dimensions in youth psychiatry." *bioRxiv* (2025): 2025-08. (under review)

