

Top three symptom dimensions are shared for male and female youth: A data-driven factor analysis study in a large transdiagnostic database

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Background & Objectives:

- Sex-based differences in neurobiology and in the prevalence of psychiatric disorders are well-established.
- A common way to try to account for this variance in developmental studies is use sex as a covariate.
- Here, we assess a prospective approach to identify sex-based differences in youth mental health symptoms.

Methods:

- All data are from the Healthy Brain Network biobank.¹
- Youth with transdiagnostic mental health concerns: N=1986, 680 females, 1306 males, age range 5-16 years.
- We applied exploratory factor analysis (EFA)² and principal component analysis (PCA) to the full sample and to males and females separately to identify data-driven symptom groupings within the Child Behavior Checklist (CBCL) scores.
- Factor loadings were iteratively re-measured in successively larger EFA models to identify the maximum number of factors that adequately simplify CBCL scores.
- EFA and PCA results were used to identify an appropriate number of principal components explaining the most variance in CBCL scores.

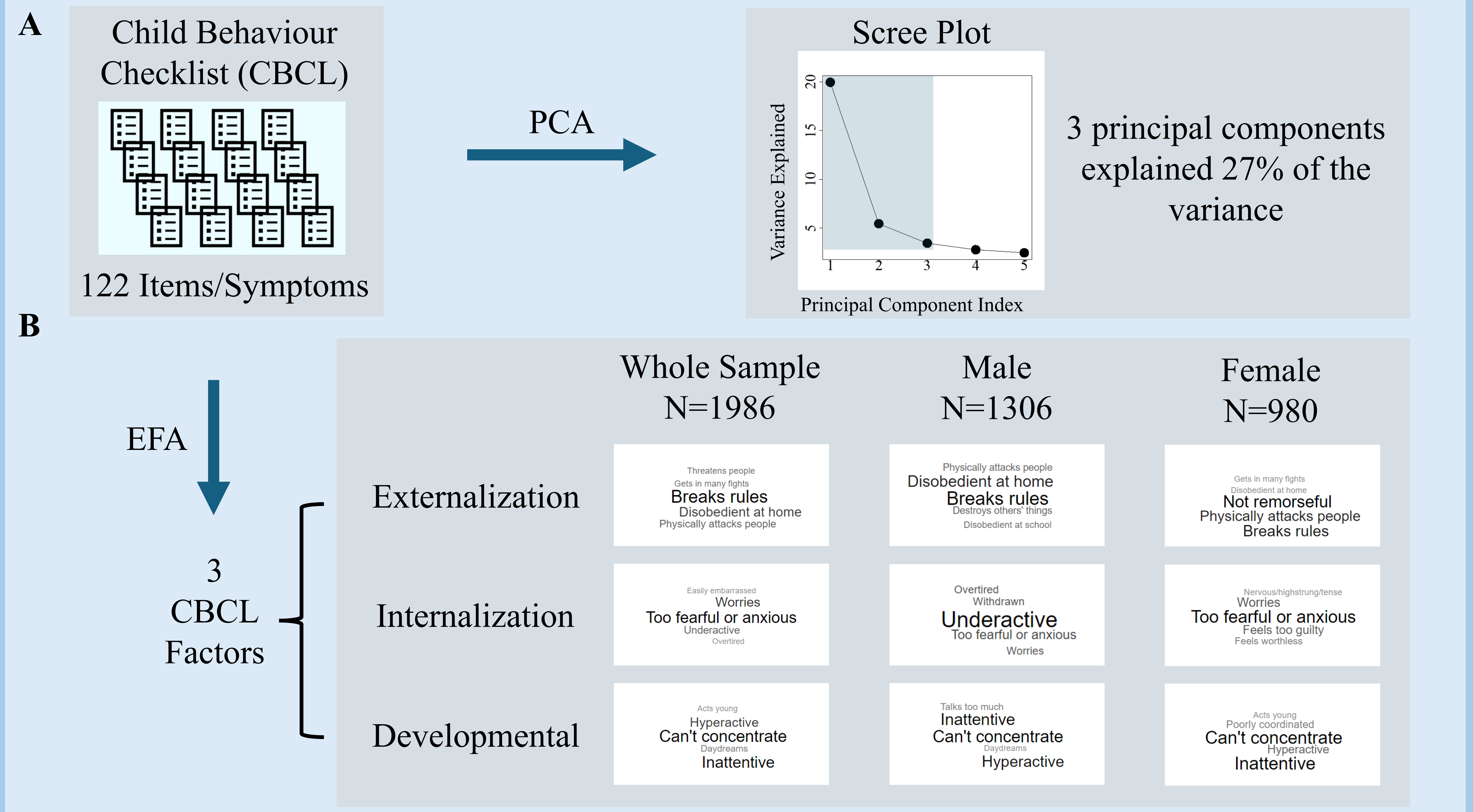
Results:

- Five EFA factors had sufficiently strong loadings to be considered meaningful.
- Three PCA components explained 27% of the variance in CBCL scores.
- When restricted to 3 factors, EFA results were consistent for males, females and full sample and replicated higher-order constructs of youth mental illness from previous studies: externalization, internalization, neurodevelopmental.

Conclusions:

- These findings support the combining of both sexes in subsequent analyses for this project.
- Findings are limited by the CBCL tool itself: there may not be major sex-based differences in symptoms at this level, or the tool may not capture them.

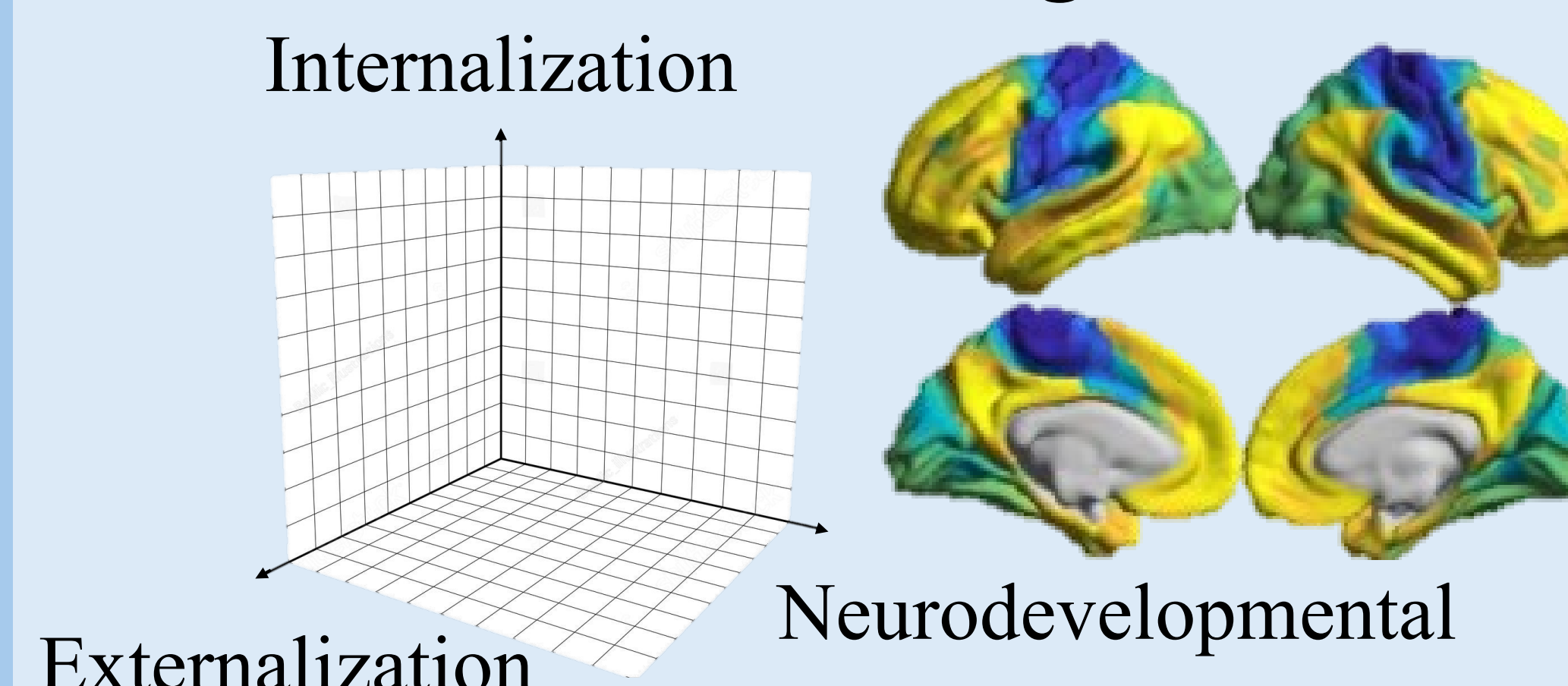
Figure 1: Dimensionality reduction of 122 transdiagnostic youth mental health symptoms



Key Findings:

- Replicated expected hierarchical transdiagnostic youth mental health symptom dimensions in an open-science database. These dimensions appear consistent between biological sexes.

Future Directions: Relating CBCL factors to gradients of brain organization



- These 3 factor scores (Externalization, Internalization, Neurodevelopmental) could be used to test for brain-behaviour relationships between youth CBCL scores and neuroimaging data³.
- This dimensional approach to transdiagnostic symptom ratings could be correlated with dimensional gradients of brain connectivity, which incorporates relationships across the cortical surface⁴.
- The current results suggest that including CBCL data from males and females in one sample is justified in this open-science dataset.

Acknowledgments:

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References:

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