Parent and Provider Perceptions of Behavioral Healthcare in Pediatric Primary Care (PI: Andrew Riley; BDP2-262)

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# Import Andrew's SPSS data

Map new names to variables.

|  |  |
| --- | --- |
| oldnames | newnames |
| record\_id | id |
| eng\_span | languageSurvey |
| children\_totv\_1 | totalChildren |
| oldest\_middle\_youngest | birthOrder |
| child\_sexv\_1 | childSex |
| child\_age\_years | childAge |
| child\_ethnicity | childEthnicity |
| child\_racev\_1\_**1 |childRaceWhite | |child\_racev\_1**\_2 |childRaceAsian | |child\_racev\_1\_\_\_3 |childRaceAfrAm | |child\_racev\_1\_\_\_4 |childRaceAIAN | |child\_racev\_1\_\_\_5 |childRaceNHPI | |child\_racev\_1\_\_\_6 |childRaceOther | |child\_racev\_1\_\_\_7 |childRaceNoResp | |related\_child |childRelationship | |gender |parentGender | |parent\_sexv\_1 |parentSex | |parent\_agev\_1 |parentAge | |parent\_ethnicity |parentEthnicity | |parent\_race\_\_\_1 |parentRaceWhite | |parent\_race\_\_\_2 |parentRaceAsian | |parent\_race\_\_\_3 |parentRaceAfrAm | |parent\_race\_\_\_4 |parentRaceAIAN | |parent\_race\_\_\_5 |parentRaceNHPI | |parent\_race\_\_\_6 |parentRaceOther | |parent\_race\_\_\_7 |parentRaceNoResp | |marital\_status |parentMaritalStatus | |parenting\_situationv\_1 |parentSituation | |number\_parents |parentsNumber | |parent\_to\_child\_ratio |parentChildRatio | |zipcode\_classification\_combined |zipcodeClass | |zipcode |zipcode | |community\_type |community | |distance |distance | |parent\_educationv\_1 |parentEducation | |annual\_income |income | |internet |internet | |ECBI\_intensity\_raw\_score |ECBI\_intensity\_raw\_score | |ECBI\_intensity\_T\_score |ECBI\_intensity\_T\_score | |ECBI\_intensity\_clinical\_cutoff |ECBI\_intensity\_clinical\_cutoff | |ECBI\_problem\_raw\_score |ECBI\_problem\_raw\_score | |ECBI\_problem\_T\_score |ECBI\_problem\_T\_score | |ECBI\_problem\_clinical\_cutoff |ECBI\_problem\_clinical\_cutoff | |ECBI\_Opp |ECBI\_Opp | |ECBI\_Inatt |ECBI\_Inatt | |ECBI\_Cond |ECBI\_Cond | |MAPS\_PP |MAPS\_PP | |MAPS\_PR |MAPS\_PR | |MAPS\_WM |MAPS\_WM | |MAPS\_SP |MAPS\_SP | |MAPS\_HS |MAPS\_HS | |MAPS\_LC |MAPS\_LC | |MAPS\_PC |MAPS\_PC | |MAPS\_POS |MAPS\_POS | |MAPS\_NEG |MAPS\_NEG | |SEPTI\_nurturance |SEPTI\_nurturance | |SEPTI\_n\_clinical\_cutoff |SEPTI\_n\_clinical\_cutoff | |SEPTI\_discipline |SEPTI\_discipline | |SEPTI\_d\_clinical\_cutoff |SEPTI\_d\_clinical\_cutoff | |SEPTI\_play |SEPTI\_play | |SEPTI\_p\_clinical\_cutoff |SEPTI\_p\_clinical\_cutoff | |SEPTI\_routine |SEPTI\_routine | |SEPTI\_r\_clinical\_cutoff |SEPTI\_r\_clinical\_cutoff | |SEPTI\_total |SEPTI\_total | |SEPTI\_total\_clin\_cutoff |SEPTI\_total\_clin\_cutoff | |PCB1\_Total |PCB1\_Total | |PCB1\_CondEmot |PCB1\_CondEmot | |PCB1\_DevHab |PCB1\_DevHab | |PCB2\_Tot |PCB2\_Tot | |PCB3\_Total |PCB3\_Total | |PBC3\_PCPonly |PCB3\_PCPonly | |PCB3\_Person |PCB3\_Person | |PCB3\_Resource |PCB3\_Resource | |

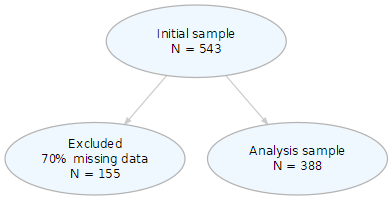
## Warning: package 'bindrcpp' was built under R version 3.4.4

Remove certain predictor variables:

* Clinical cutoffs
* Raw scores
* Total scores

## [1] "ECBI\_intensity\_raw\_score" "ECBI\_intensity\_clinical\_cutoff"  
## [3] "ECBI\_problem\_raw\_score" "ECBI\_problem\_clinical\_cutoff"   
## [5] "SEPTI\_n\_clinical\_cutoff" "SEPTI\_d\_clinical\_cutoff"   
## [7] "SEPTI\_p\_clinical\_cutoff" "SEPTI\_r\_clinical\_cutoff"   
## [9] "SEPTI\_total" "SEPTI\_total\_clin\_cutoff"

Build analysis data set. Exclude if missing any dependent variable, PCB1\_Total, PCB2\_Tot, PCB3\_Total. Exclude rows if there are a high proportion of row-wise NA.



figures/flowChart.png

# Cluster analysis

Use divisive hierarchical clustering (DIANA). See [Divisive Hierarchical Clustering Essentials](http://www.sthda.com/english/articles/28-hierarchical-clustering-essentials/94-divisive-hierarchical-clustering-essentials/).

## Warning: package 'cluster' was built under R version 3.4.4

## Warning: package 'factoextra' was built under R version 3.4.4

## Welcome! Related Books: `Practical Guide To Cluster Analysis in R` at https://goo.gl/13EFCZ

##   
## To cite package 'factoextra' in publications use:  
##   
## Alboukadel Kassambara and Fabian Mundt (2017). factoextra:  
## Extract and Visualize the Results of Multivariate Data Analyses.  
## R package version 1.0.5.  
## https://CRAN.R-project.org/package=factoextra  
##   
## A BibTeX entry for LaTeX users is  
##   
## @Manual{,  
## title = {factoextra: Extract and Visualize the Results of Multivariate Data Analyses},  
## author = {Alboukadel Kassambara and Fabian Mundt},  
## year = {2017},  
## note = {R package version 1.0.5},  
## url = {https://CRAN.R-project.org/package=factoextra},  
## }

Use the **manhattan** metric.

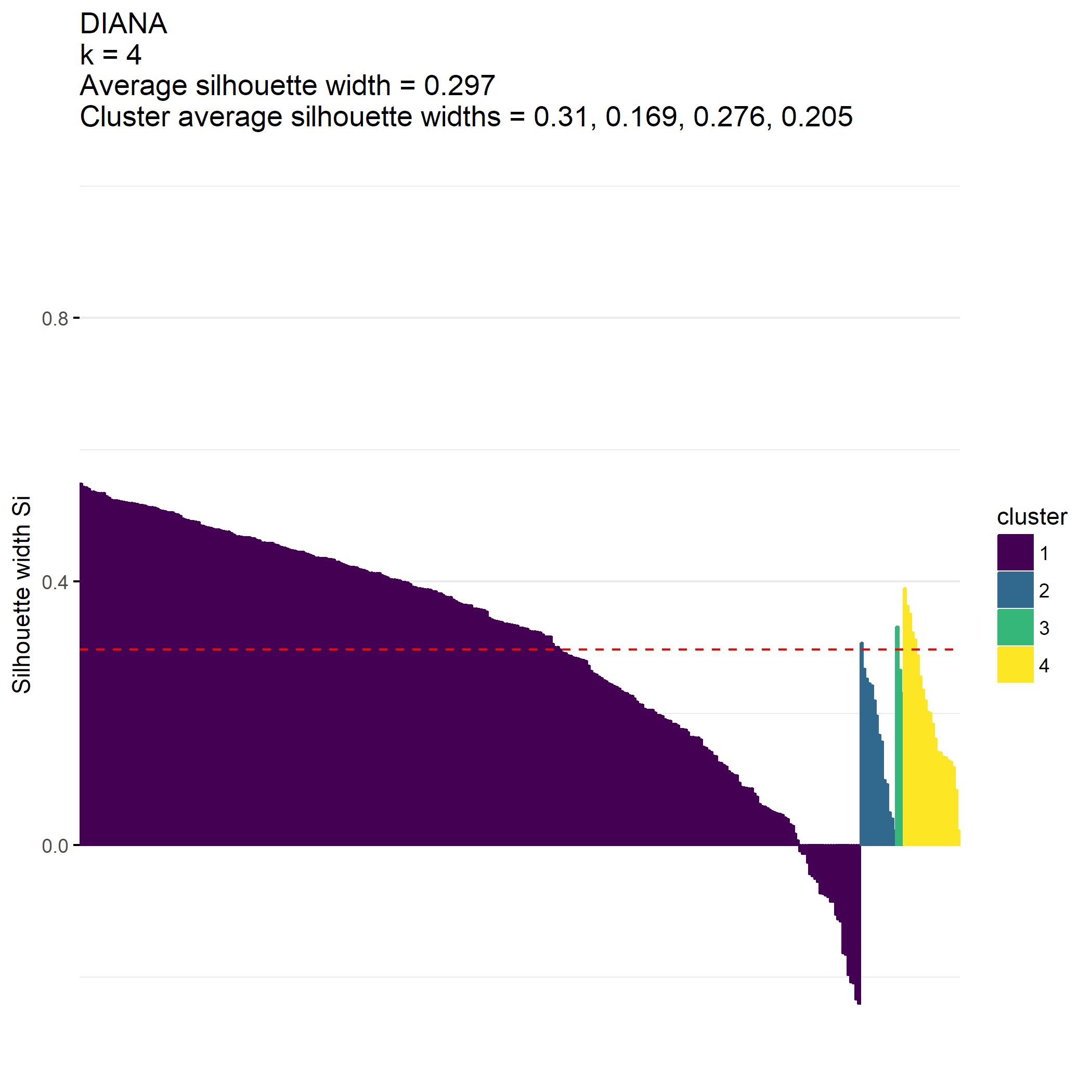
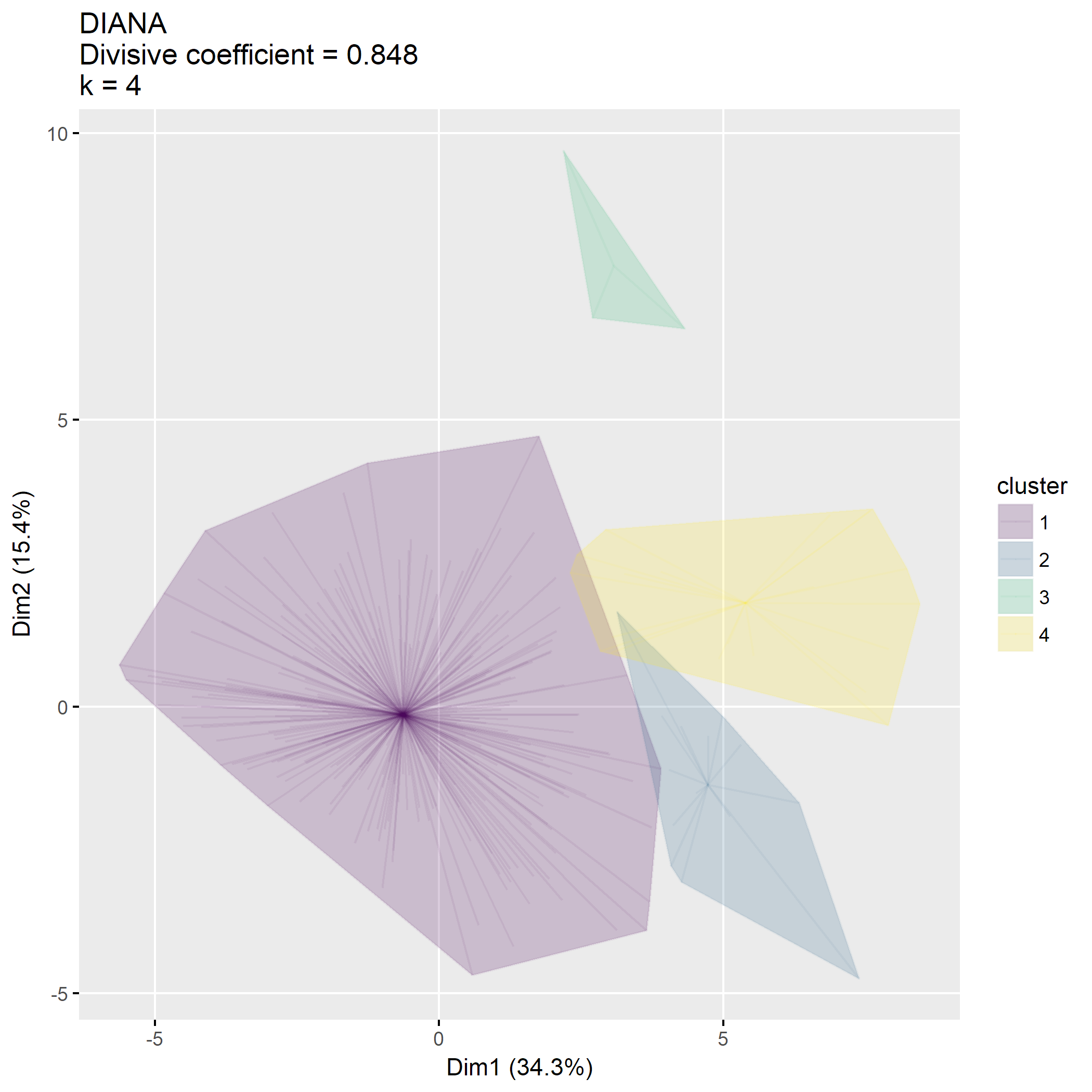
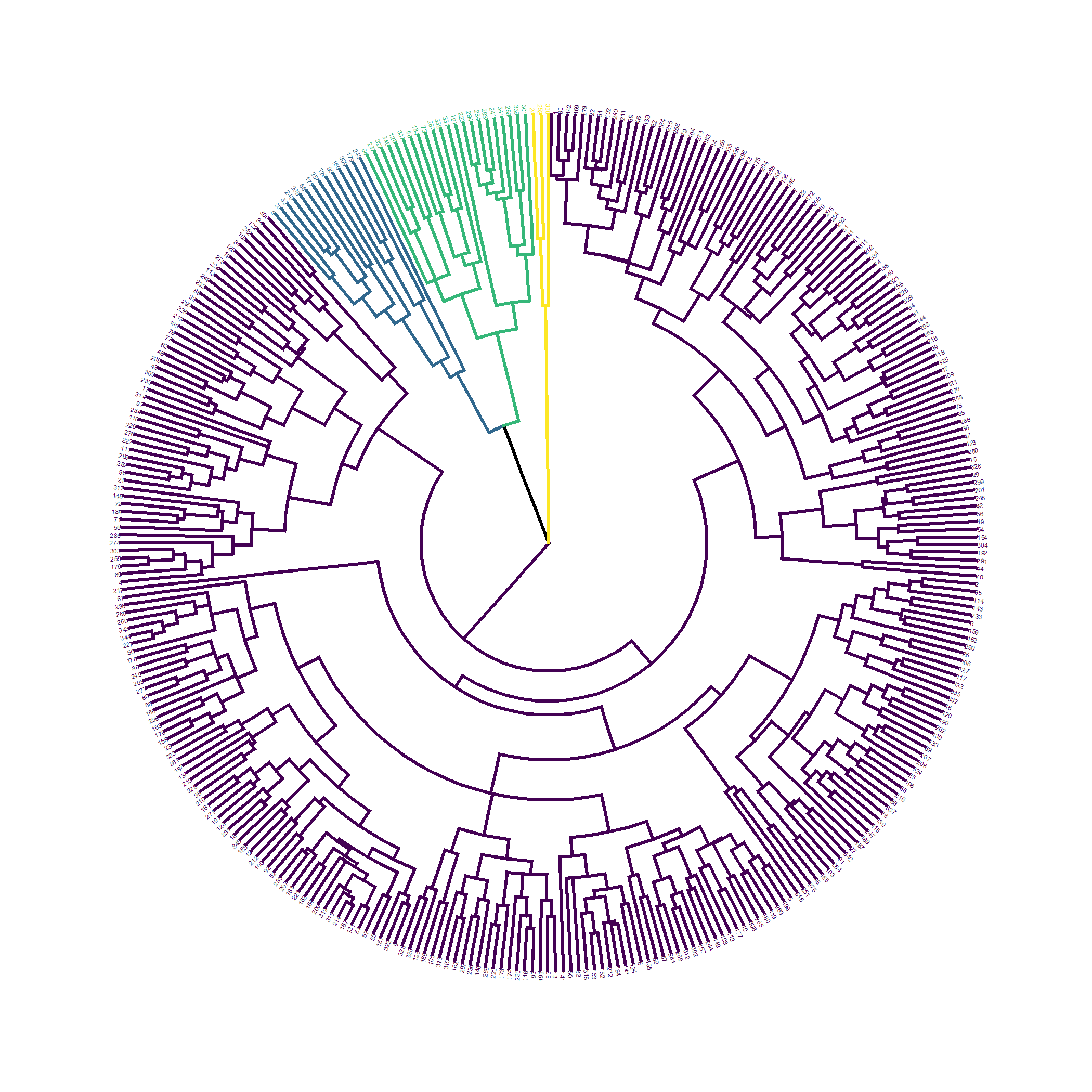
## Cluster on ECBI, MAPS, SEPTI metrics and parent's race

## [1] 345 20

## [1] "parentRaceWhite0" "parentRaceWhite1"   
## [3] "ECBI\_intensity\_T\_score" "ECBI\_problem\_T\_score"   
## [5] "ECBI\_Opp" "ECBI\_Inatt"   
## [7] "ECBI\_Cond" "MAPS\_PP"   
## [9] "MAPS\_PR" "MAPS\_WM"   
## [11] "MAPS\_SP" "MAPS\_HS"   
## [13] "MAPS\_LC" "MAPS\_PC"   
## [15] "MAPS\_POS" "MAPS\_NEG"   
## [17] "SEPTI\_nurturance" "SEPTI\_discipline"   
## [19] "SEPTI\_play" "SEPTI\_routine"

## cluster size ave.sil.width  
## 1 1 306 0.31  
## 2 2 14 0.17  
## 3 3 3 0.28  
## 4 4 22 0.21

* Hopkins statistic is 0.289
* Analysis identified clusters
* Divisive coefficient is 0.848
* Average silhouette width is 0.297



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| cluster | n | ECBI\_intensity\_T\_score\_mean | ECBI\_problem\_T\_score\_mean | ECBI\_Opp\_mean | ECBI\_Inatt\_mean | ECBI\_Cond\_mean |
| 1 | 306 | 52.9 | 53.0 | 32.7 | 13.4 | 14.7 |
| 2 | 14 | 63.9 | 68.8 | 46.3 | 16.6 | 22.4 |
| 3 | 3 | 37.7 | 44.3 | 17.7 | 5.3 | 8.0 |
| 4 | 22 | 59.5 | 56.0 | 39.0 | 14.4 | 24.4 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| cluster | n | MAPS\_PP\_mean | MAPS\_PR\_mean | MAPS\_WM\_mean | MAPS\_SP\_mean | MAPS\_HS\_mean | MAPS\_LC\_mean | MAPS\_PC\_mean | MAPS\_POS\_mean | MAPS\_NEG\_mean |
| 1 | 306 | 4.1 | 4.6 | 4.7 | 4.5 | 2.0 | 1.9 | 1.4 | 4.5 | 1.8 |
| 2 | 14 | 4.0 | 4.1 | 4.1 | 3.9 | 3.2 | 2.6 | 2.4 | 4.0 | 2.7 |
| 3 | 3 | 2.4 | 2.9 | 3.2 | 2.1 | 1.5 | 1.9 | 1.9 | 2.7 | 1.8 |
| 4 | 22 | 3.2 | 3.6 | 3.8 | 3.4 | 2.8 | 2.9 | 2.3 | 3.5 | 2.7 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| cluster | n | SEPTI\_nurturance\_mean | SEPTI\_discipline\_mean | SEPTI\_play\_mean | SEPTI\_routine\_mean |
| 1 | 306 | 38.1 | 24.2 | 32.6 | 29.3 |
| 2 | 14 | 34.1 | 15.9 | 21.8 | 21.6 |
| 3 | 3 | 26.3 | 19.3 | 25.7 | 24.0 |
| 4 | 22 | 30.8 | 18.9 | 27.0 | 23.5 |

|  |  |  |  |
| --- | --- | --- | --- |
| cluster | parentRaceWhite | n | pct |
| 1 | 0 | 53 | 0.17 |
| 1 | 1 | 253 | 0.83 |
| 2 | 0 | 4 | 0.29 |
| 2 | 1 | 10 | 0.71 |
| 3 | 1 | 3 | 1.00 |
| 4 | 0 | 21 | 0.95 |
| 4 | 1 | 1 | 0.05 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| cluster | n | PCB1\_Total\_mean | PCB1\_CondEmot\_mean | PCB1\_DevHab\_mean |
| 1 | 306 | 66.0 | 47.7 | 18.2 |
| 2 | 14 | 73.1 | 53.3 | 19.8 |
| 3 | 3 | 85.3 | 62.3 | 23.0 |
| 4 | 22 | 71.8 | 51.8 | 20.0 |

|  |  |  |
| --- | --- | --- |
| cluster | n | PCB2\_Tot\_mean |
| 1 | 306 | 24.4 |
| 2 | 14 | 24.4 |
| 3 | 3 | 27.3 |
| 4 | 22 | 23.9 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| cluster | n | PCB3\_Total\_mean | PCB3\_PCPonly\_mean | PCB3\_Person\_mean | PCB3\_Resource\_mean |
| 1 | 306 | 46.3 | 4.1 | 15.7 | 26.6 |
| 2 | 14 | 50.9 | 4.1 | 17.1 | 29.6 |
| 3 | 3 | 65.7 | 4.7 | 23.3 | 37.7 |
| 4 | 22 | 52.5 | 4.1 | 18.1 | 30.2 |

* Demographic factors considered
* Parent race, White/Non-White
* Cluster 1 ()
* Majority White
* Lower ECBI scores than Clusters 2/4
* Higher positive MAPS scores than Clusters 2/4, lower negative MAPS scores than Clusters 2/4
* Higher SEPTI scores than Clusters 2/4
* Cluster 2 ()
* Majority White, *more similar to Cluster 1*
* High ECBI scores, *more similar to Cluster 4*
* Low positive MAPS scores, high negative MAPS scores, *more similar to Cluster 4*
* Low SEPTI scores, *more similar to Cluster 4*
* Cluster 3 ()
* Is a small outlier cluster
* Middle income
* Low ECBI scores
* Low positive MAPS scores, low negative MAPS scores
* Cluster 4 ()
* Majority non-White
* High ECBI scores
* Low positive MAPS scores, high negative MAPS scores
* Low SEPTI scores

## Save objects

Bind study ID, id, to cluster ID, cluster.

## mtime size  
## data/processed/clusterAnalysis.RData 2018-07-14 23:11:12 2599485

## mtime size  
## data/processed/clusterCrosswalk.csv 2018-07-14 23:11:12 3062

## mtime size  
## data/processed/clusterCrosswalk.sav 2018-07-14 23:11:12 6016