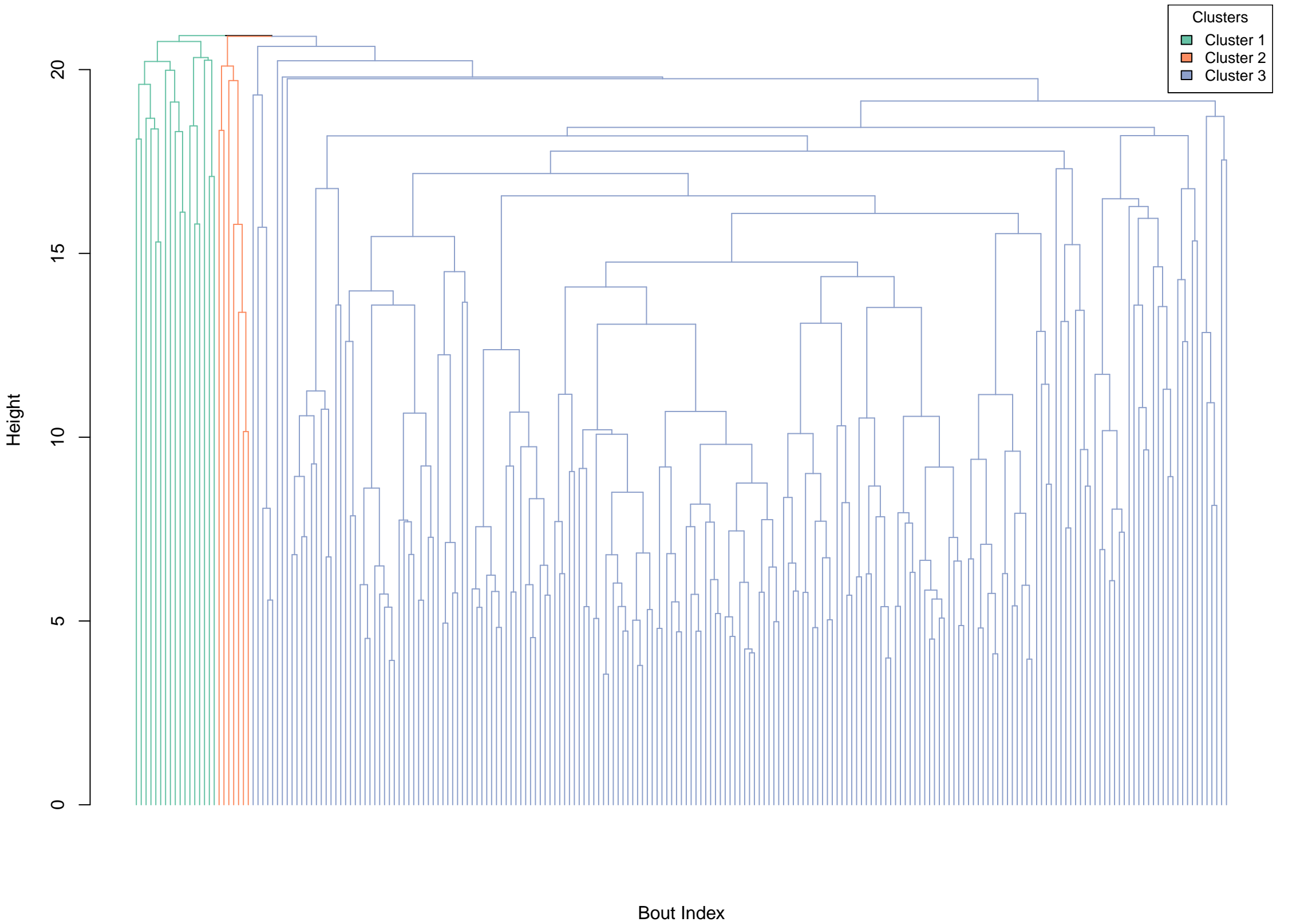


# Hierarchical Clustering Dendrogram – 3 Clusters



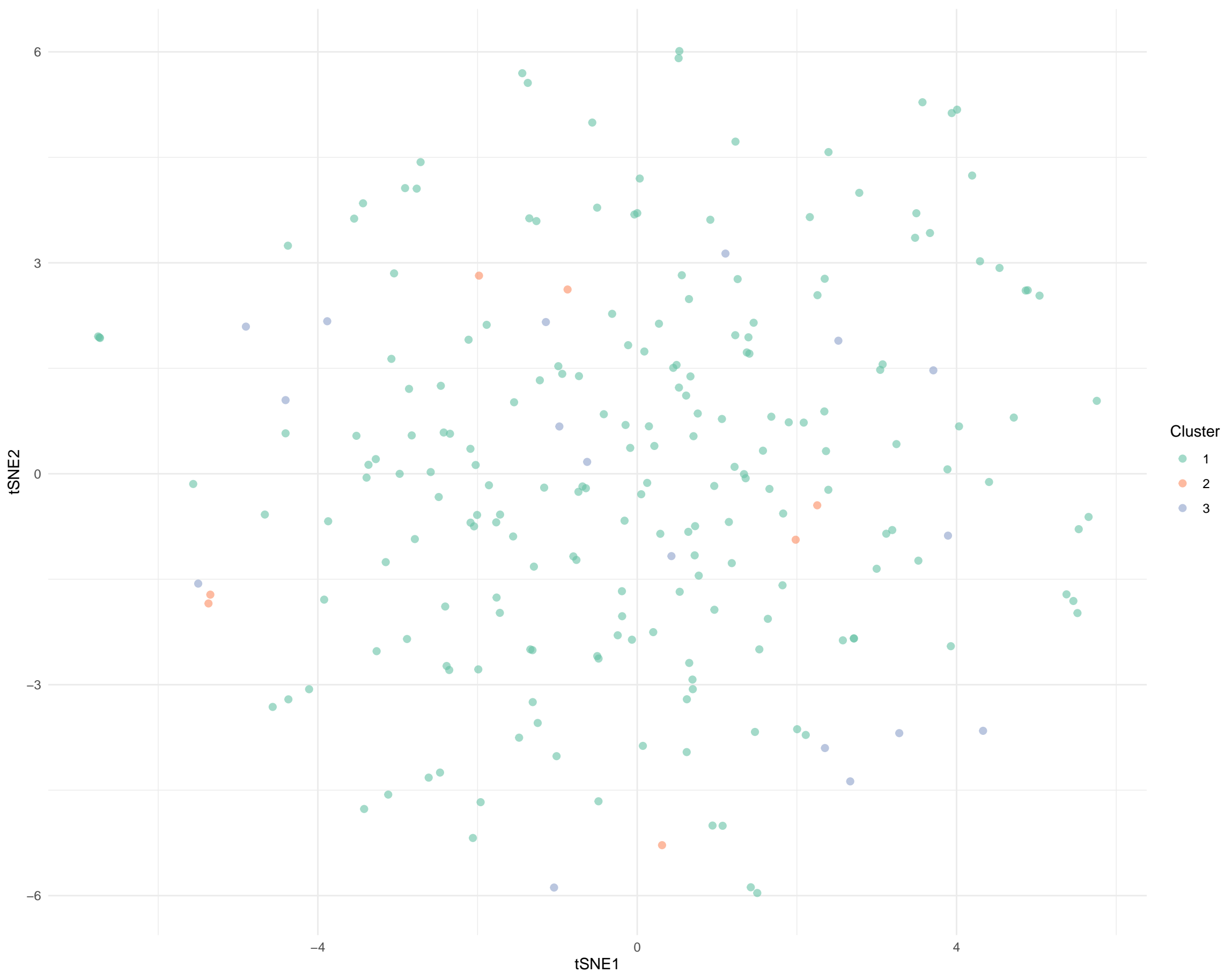
Interpretation: This dendrogram shows the hierarchical clustering tree structure. Each branch represents a group of similar bouts. The height axis indicates the distance at which clusters merge – lower heights indicate more similar

PCA Visualization – hierarchical



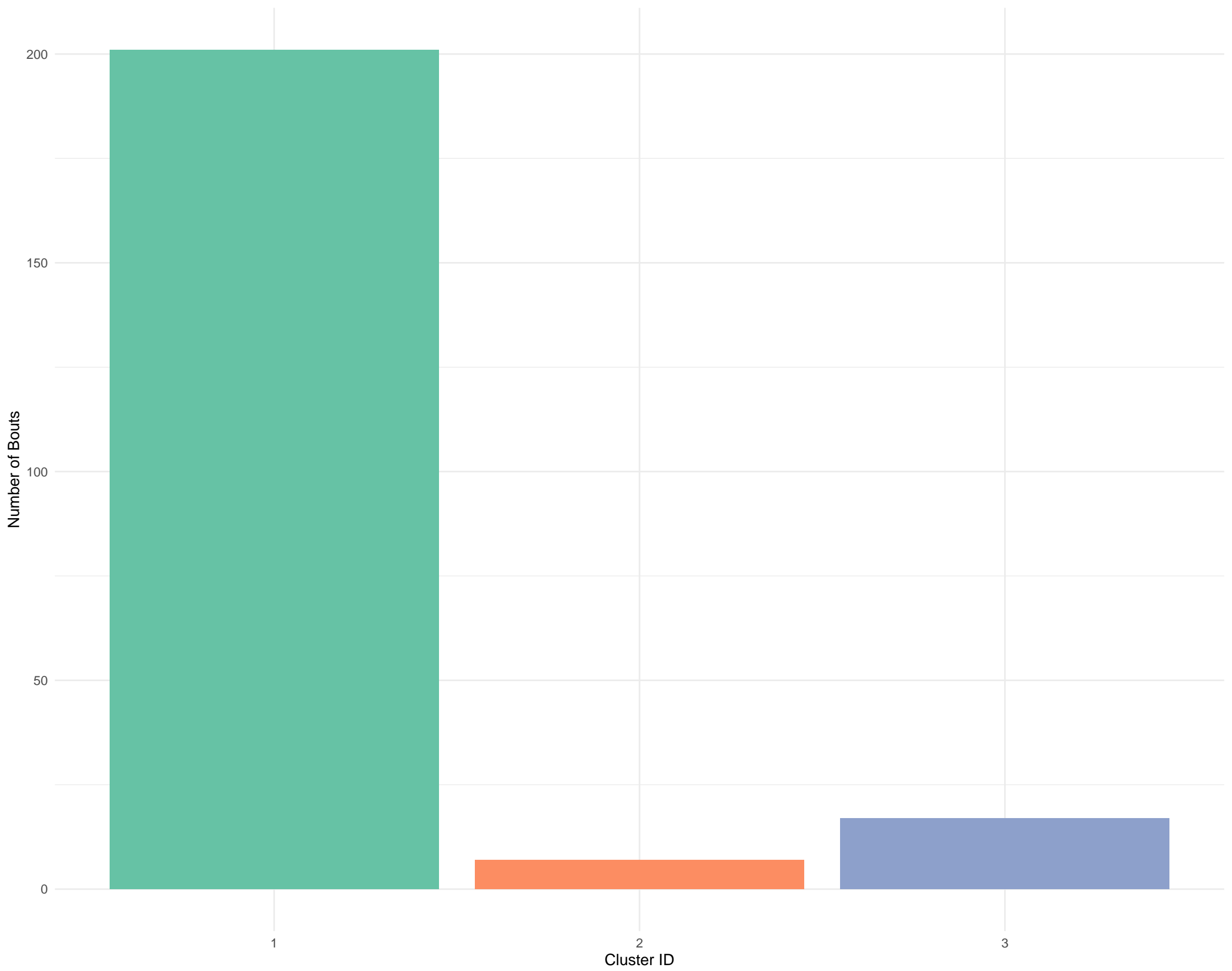
Interpretation: Principal Component Analysis (PCA) reduces high-dimensional feature space to 2D. Each point represents a bout, colored by cluster. PC1 and PC2 are linear combinations of original features that capture the most variance.

t-SNE Visualization – hierarchical

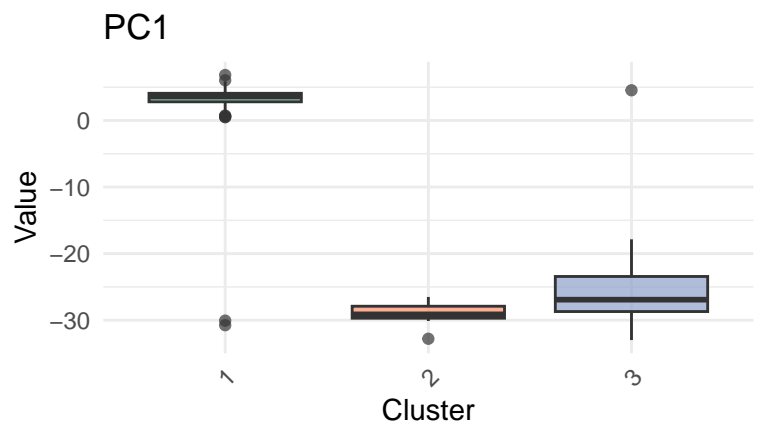


Interpretation: t-SNE (t-distributed Stochastic Neighbor Embedding) is a non-linear dimensionality reduction technique that preserves local neighborhood structure. Points close in the original high-dimensional space remain close in 2D.

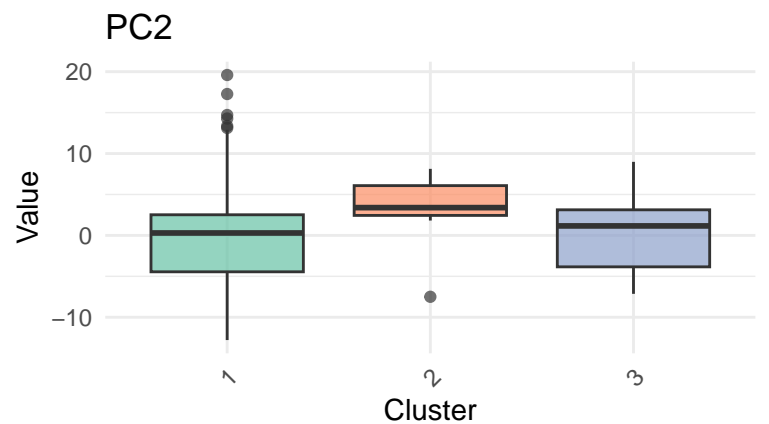
Cluster Sizes



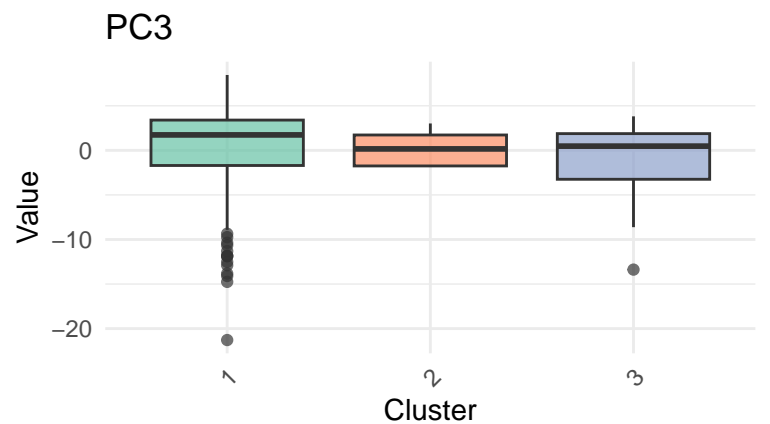
Interpretation: This bar chart shows the number of bouts assigned to each cluster. Balanced clusters (similar sizes) are generally preferred, but natural behavior patterns may result in uneven distributions. Very small clusters may represent outliers or specific subgroups.



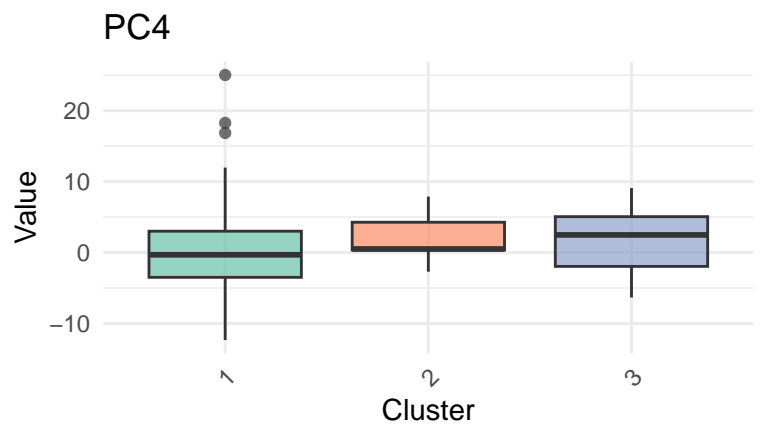
Interpretation: Boxplots show the distribution of feature values across clusters. T1



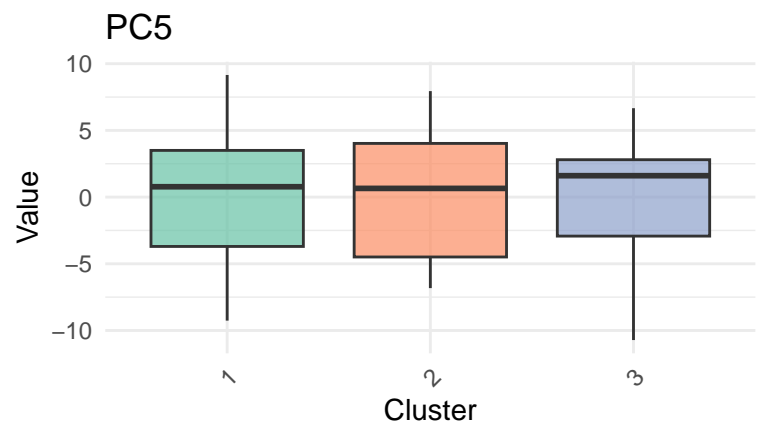
Interpretation: Boxplots show the distribution of feature values across clusters. T1



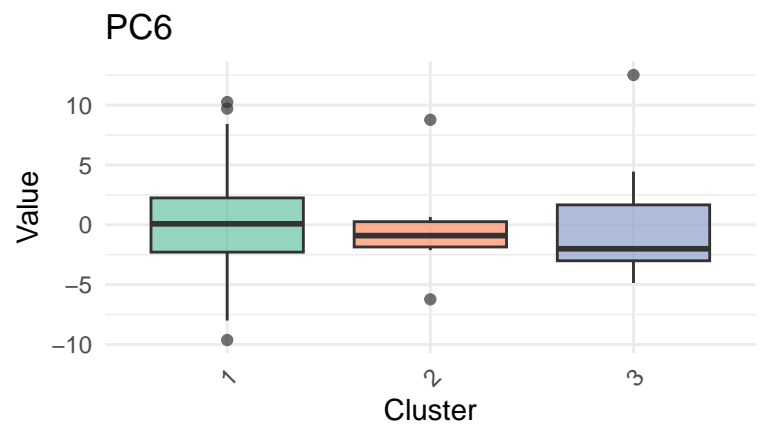
Interpretation: Boxplots show the distribution of feature values across clusters. T1



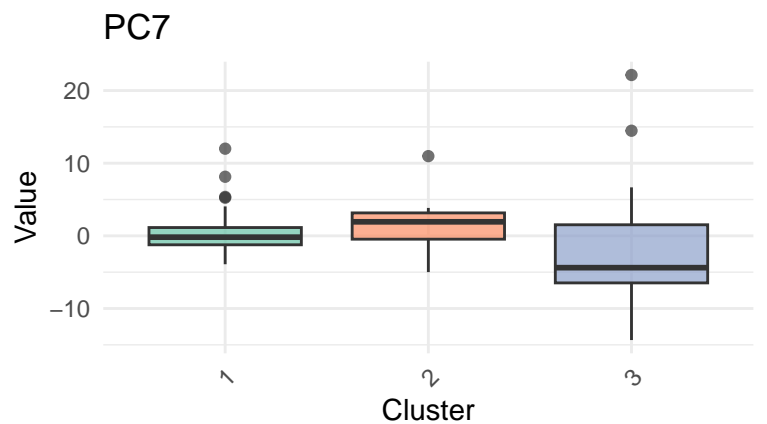
Interpretation: Boxplots show the distribution of feature values across clusters. T1



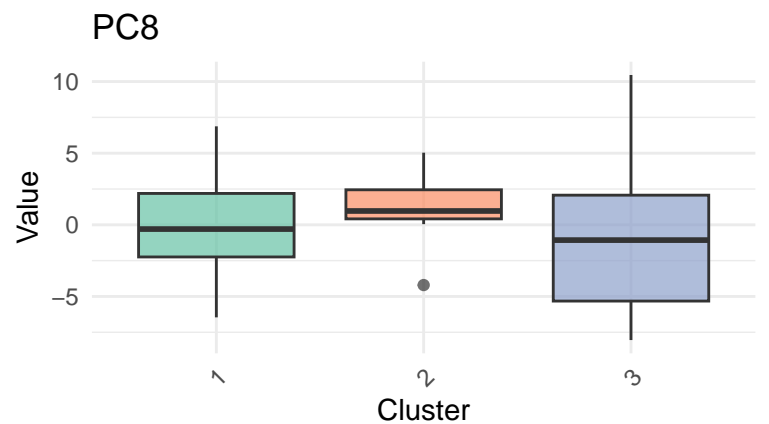
Interpretation: Boxplots show the distribution of feature values across clusters. T1



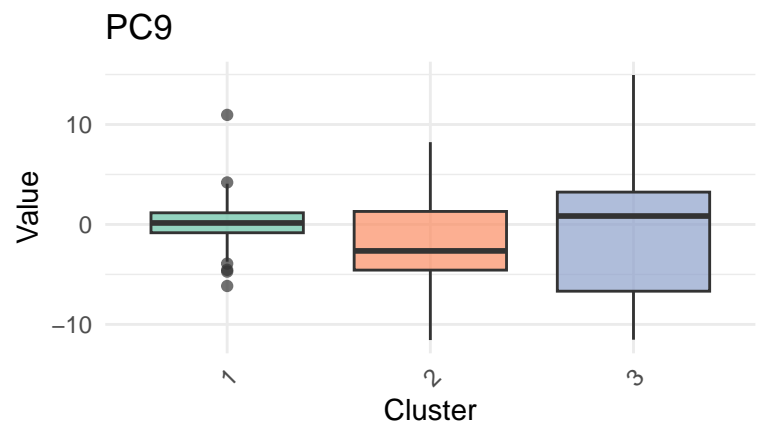
Interpretation: Boxplots show the distribution of feature values across clusters. T1



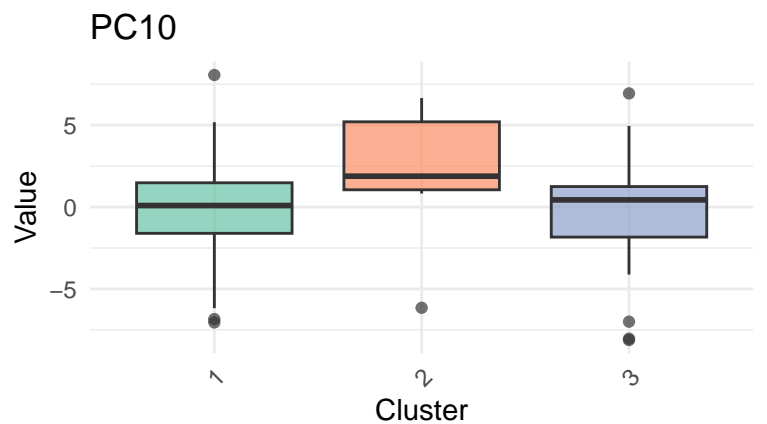
Interpretation: Boxplots show the distribution of feature values across clusters. T1



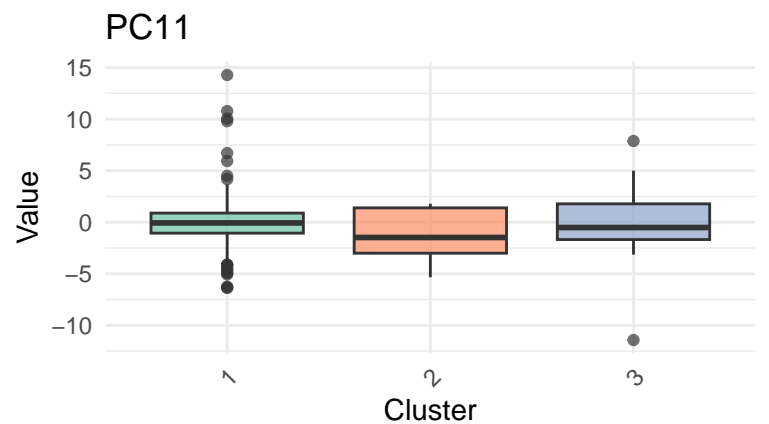
Interpretation: Boxplots show the distribution of feature values across clusters. The



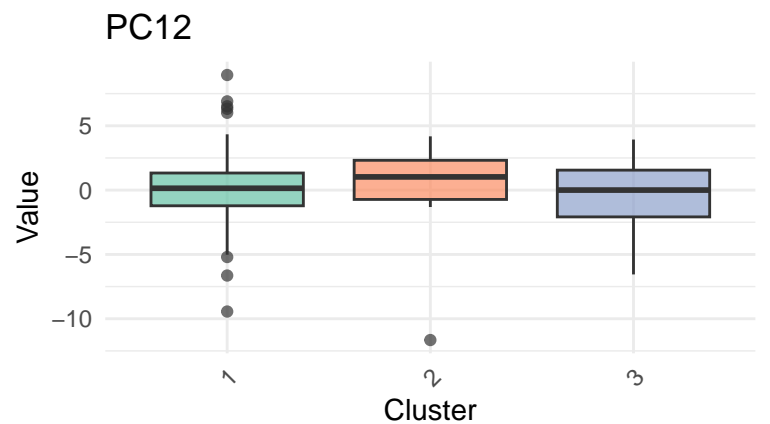
Interpretation: Boxplots show the distribution of feature values across clusters. T1



Interpretation: Boxplots show the distribution of feature values across clusters. The

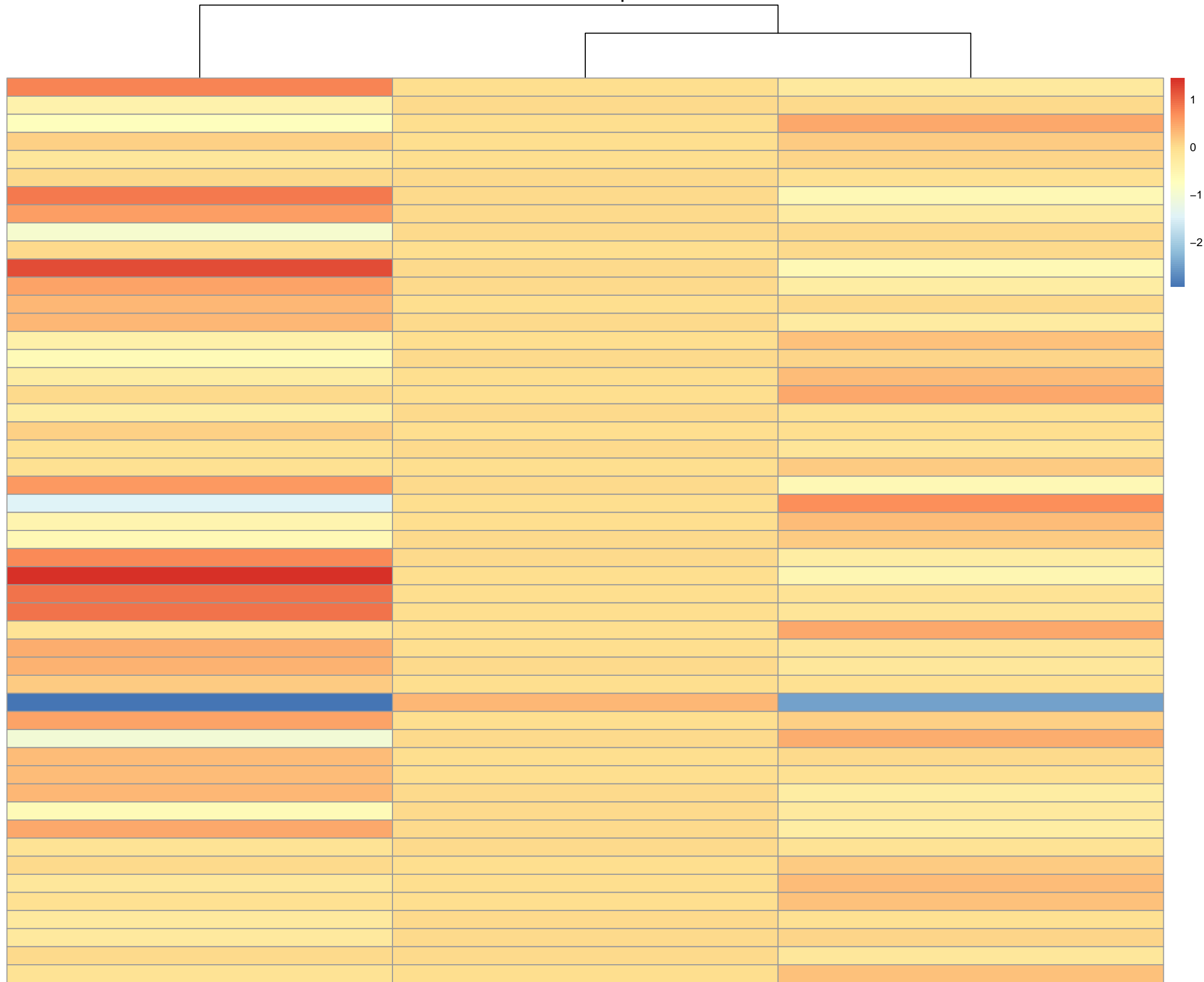


Interpretation: Boxplots show the distribution of feature values across clusters. T1



Interpretation: Boxplots show the distribution of feature values across clusters. T1

Cluster Feature Heatmap – unknown



Clustering Method: unknown

Total Bouts: 225

iss the top variable features (columns). Colors represent standardized values: red = high, blue = low, white = average. Clusters with similar color patterns share similar feature pi

Number of Clusters: 3

Cluster Sizes:

Cluster 1: 201 bouts

Cluster 2: 7 bouts

Cluster 3: 17 bouts