

# Behavior Segmentation

*Josh Cullen*

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## Background

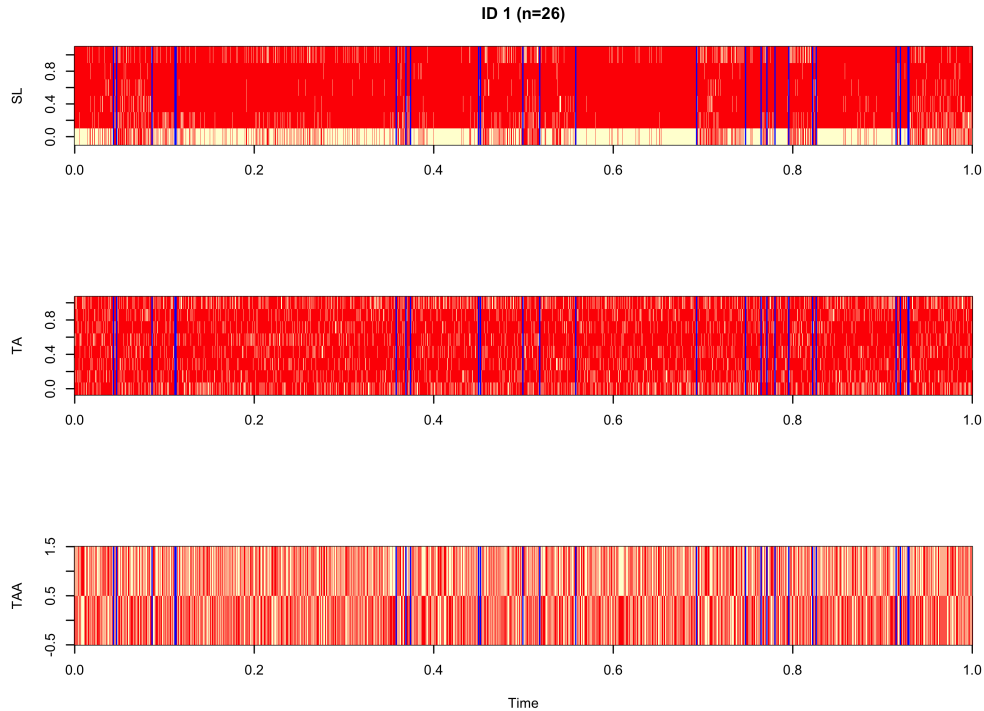
After running the time segmentation model, a behavior segmentation model was run for the entire dataset of each individual. The behavior segmentation model uses three movement parameters (step length, turning angle, and turning angle autocorrelation) to identify distinct behavioral states.

Additionally, the segmentation of behaviors was mapped to discern if the models characterized behavioral changes appropriately. This was conducted for each of the four individual snail kites. All models were analyzed on only data that were filtered for a time step of 1 h (3600 s); a quick analysis showed that a 1 h time step produces the greatest number of total observations.

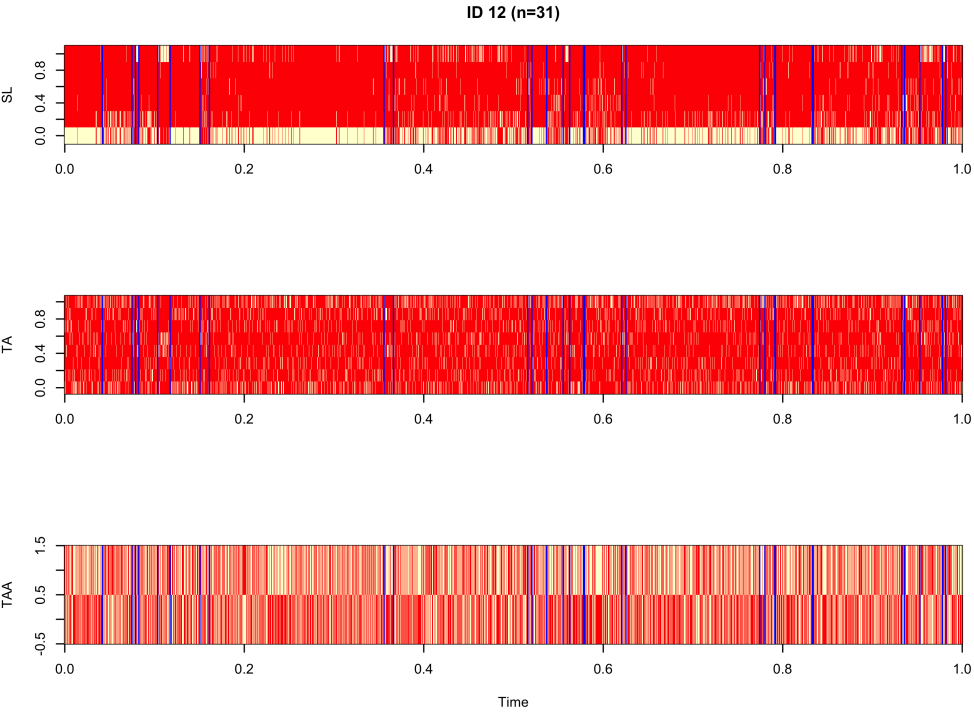
## Behavior Segmentation

All of the behavior segmentation models analyzed with the original variables (SL,TA,TAA) were run using 50000 iterations. Additional model output (# of breakpoints, log marginal likelihood) was also evaluated with traceplots, but are not included in this document. Based upon the traceplots of these variables however, it appears that a greater number of iterations is likely not needed.

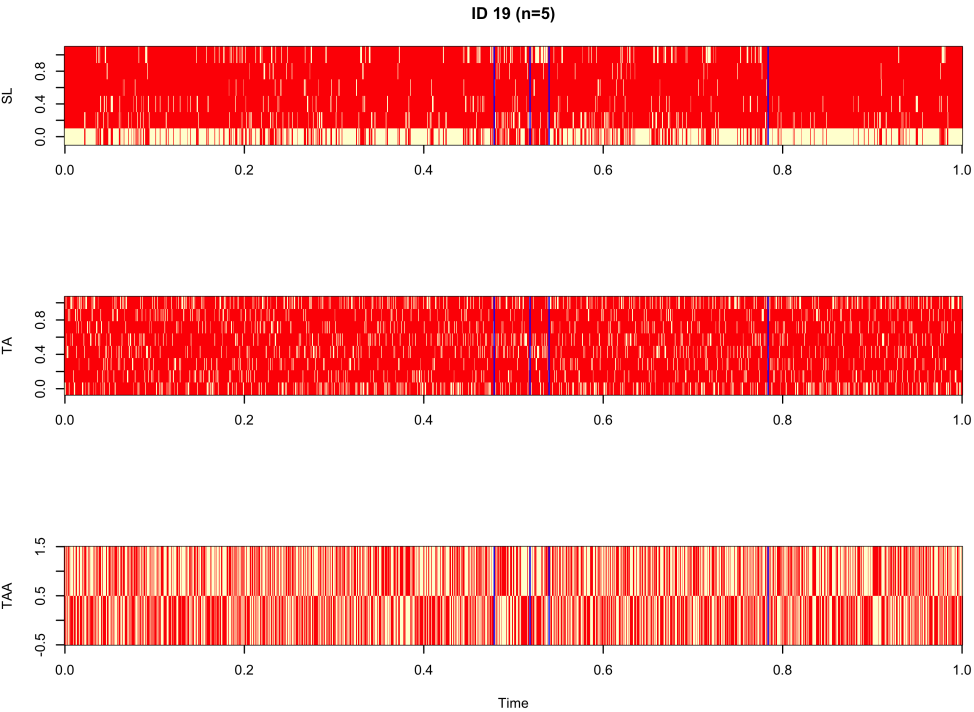
### ID 1



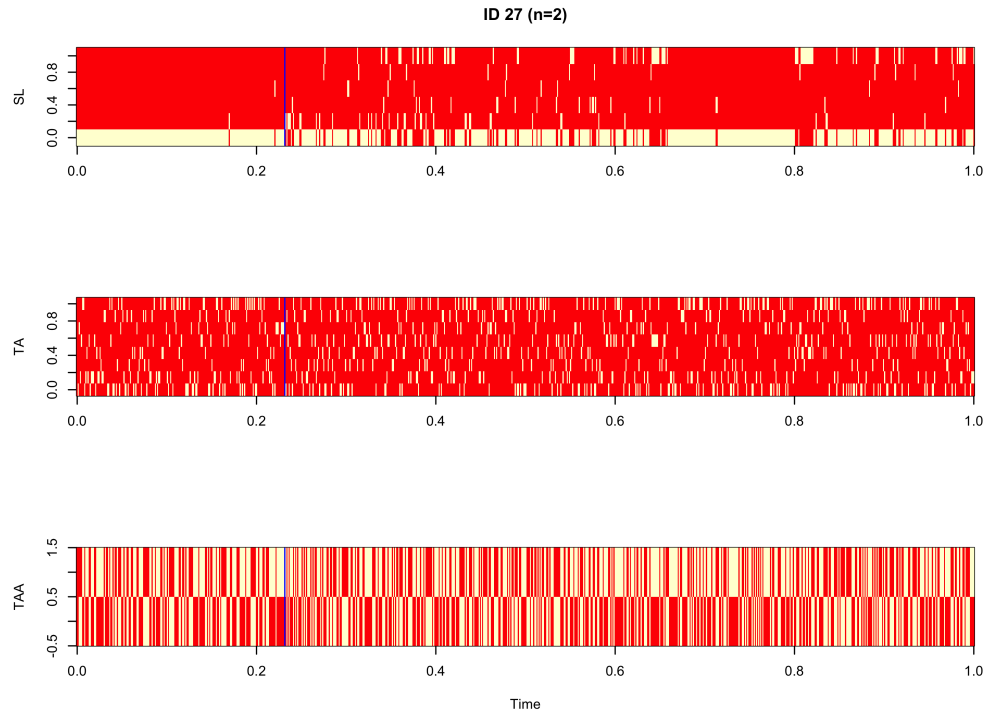
ID 12



ID 19

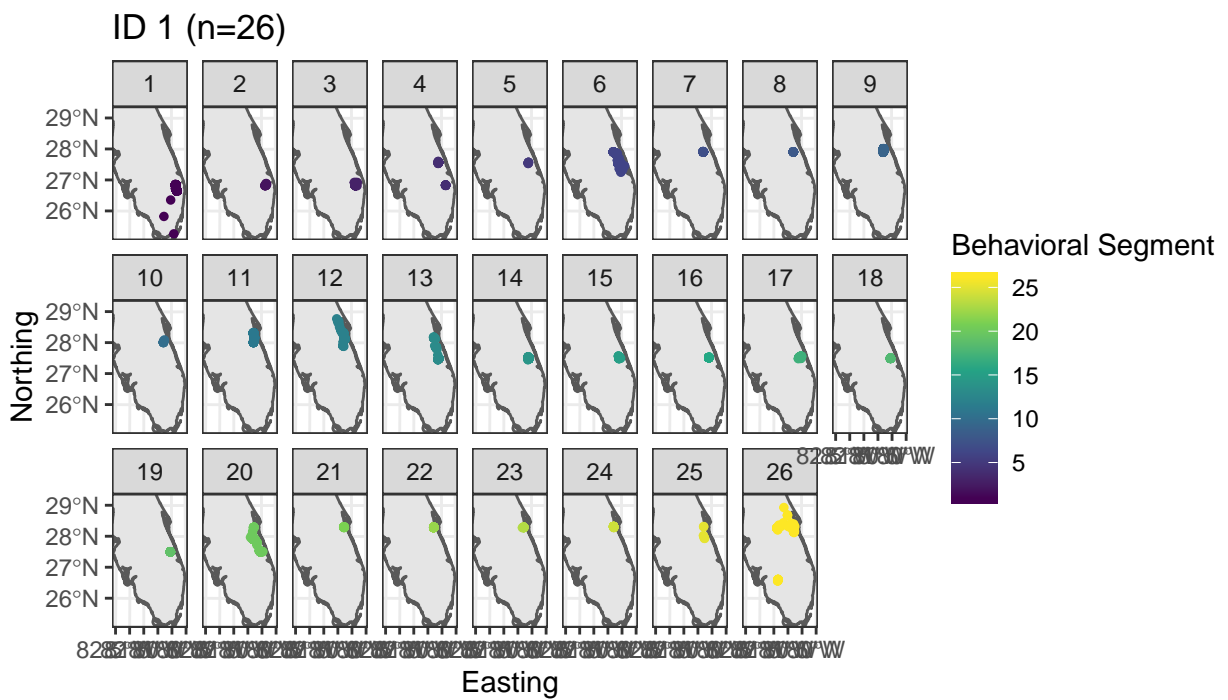
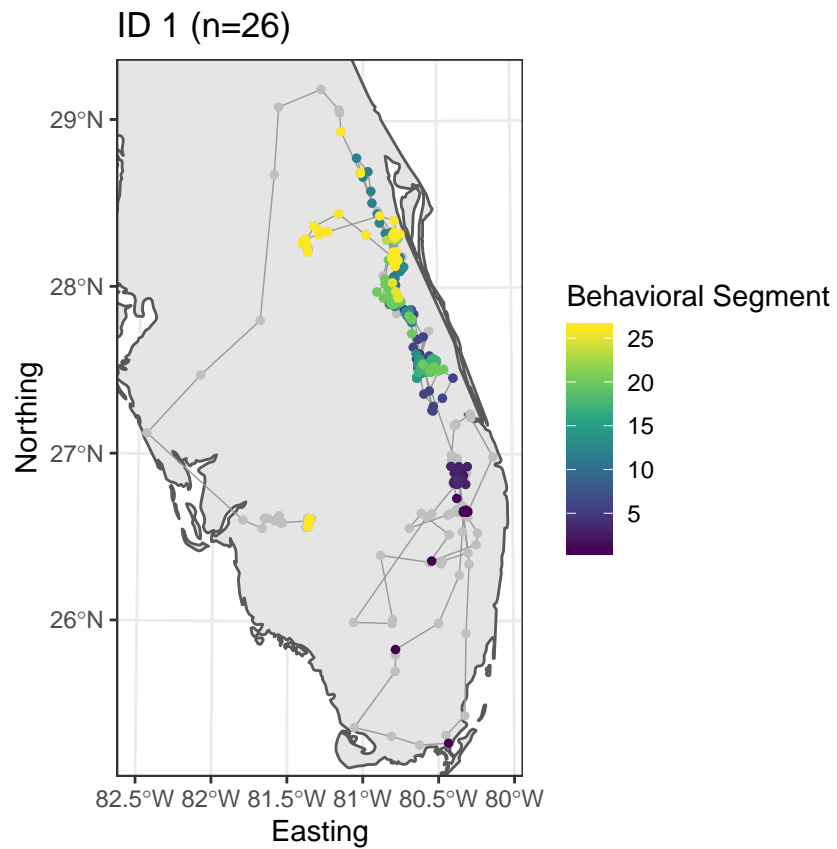


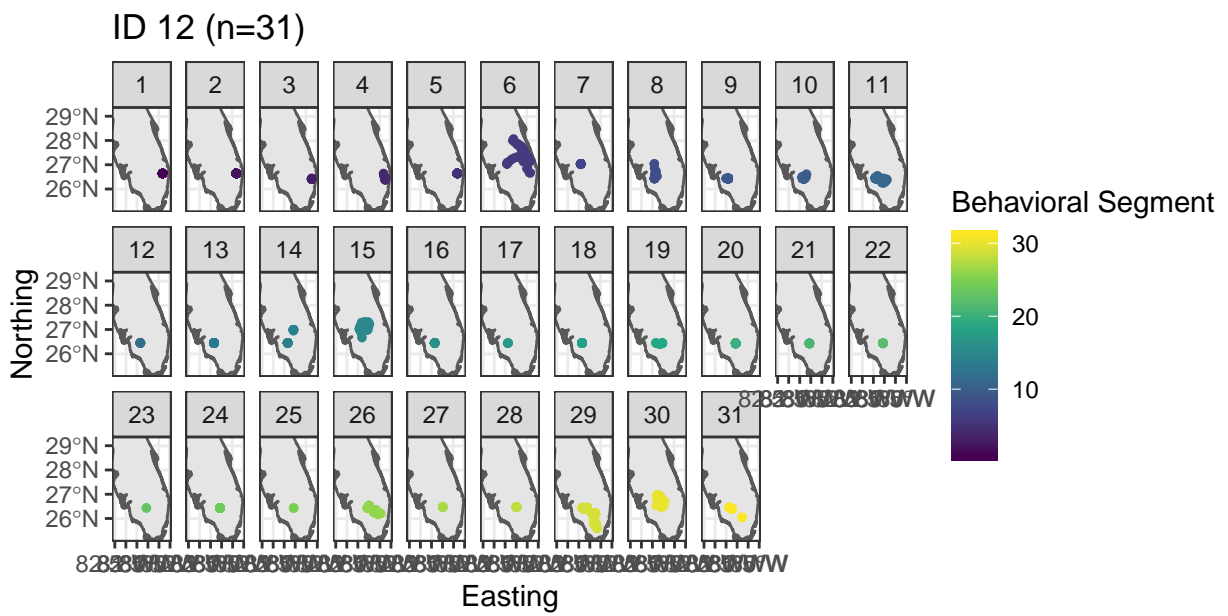
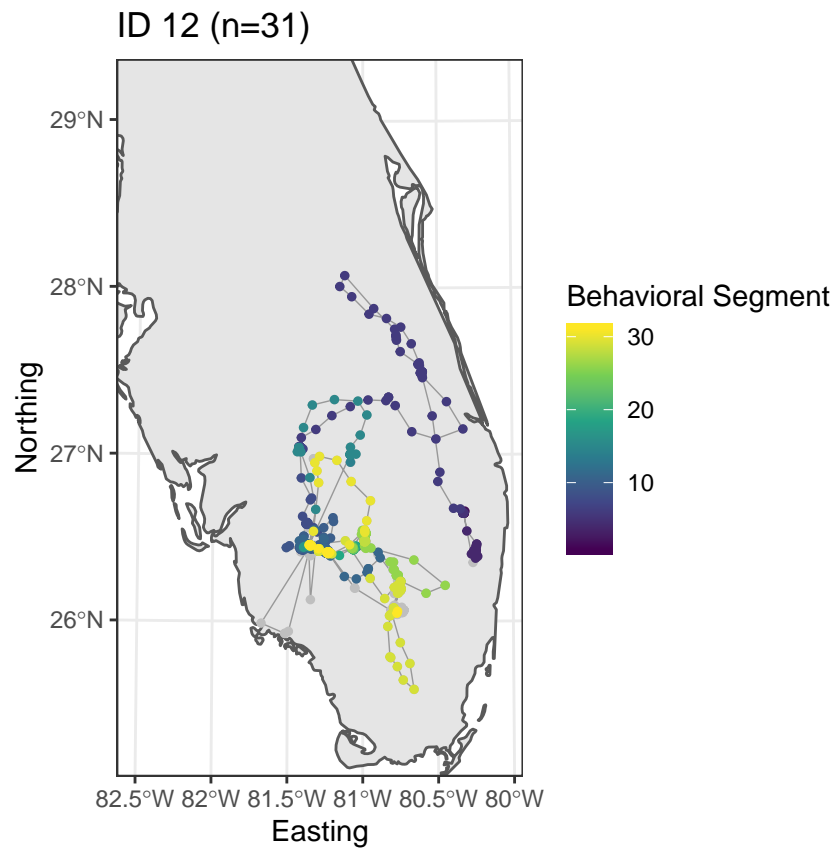
## ID 27

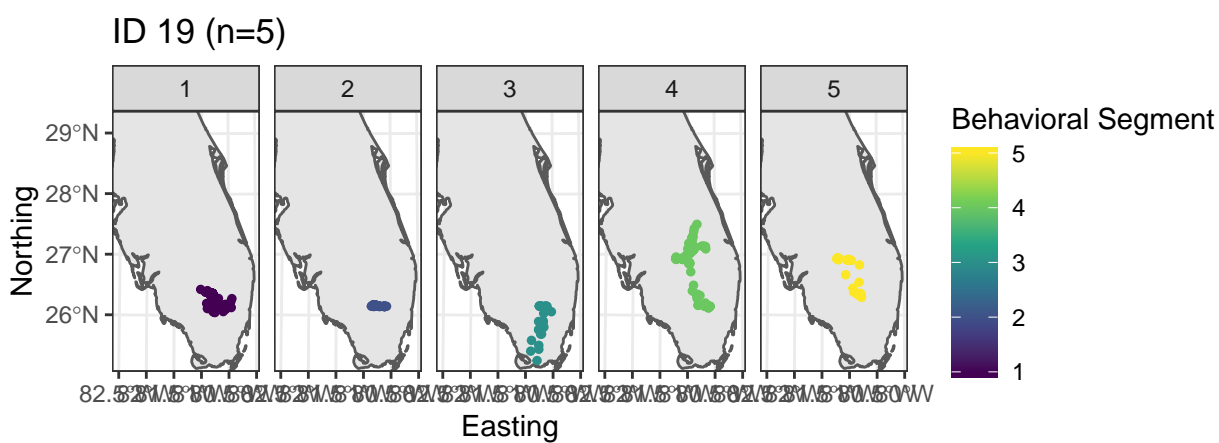
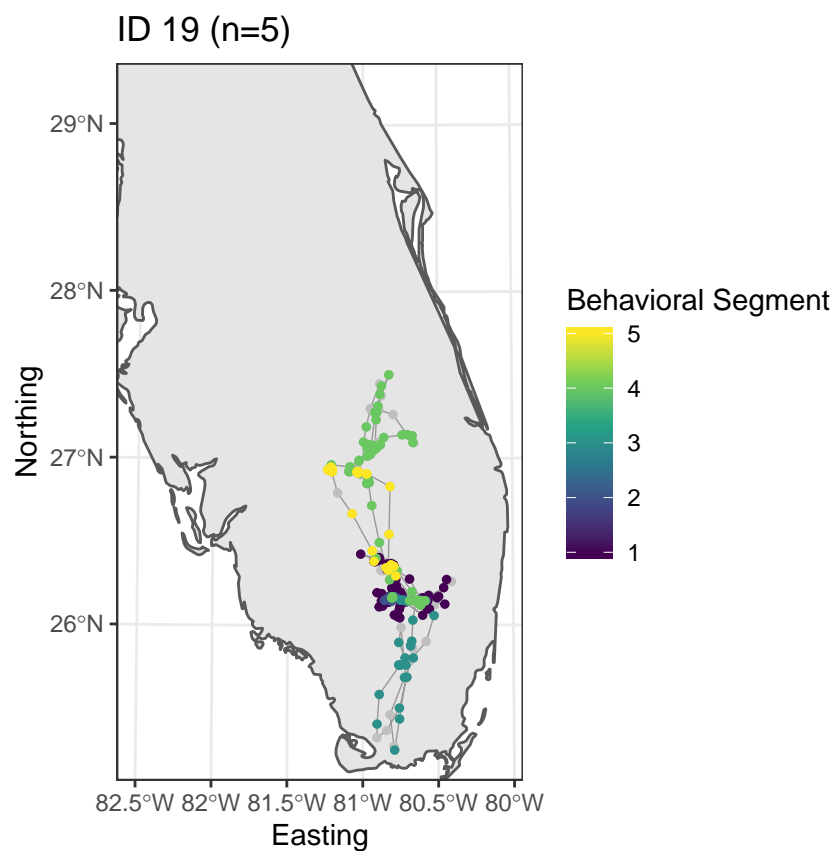


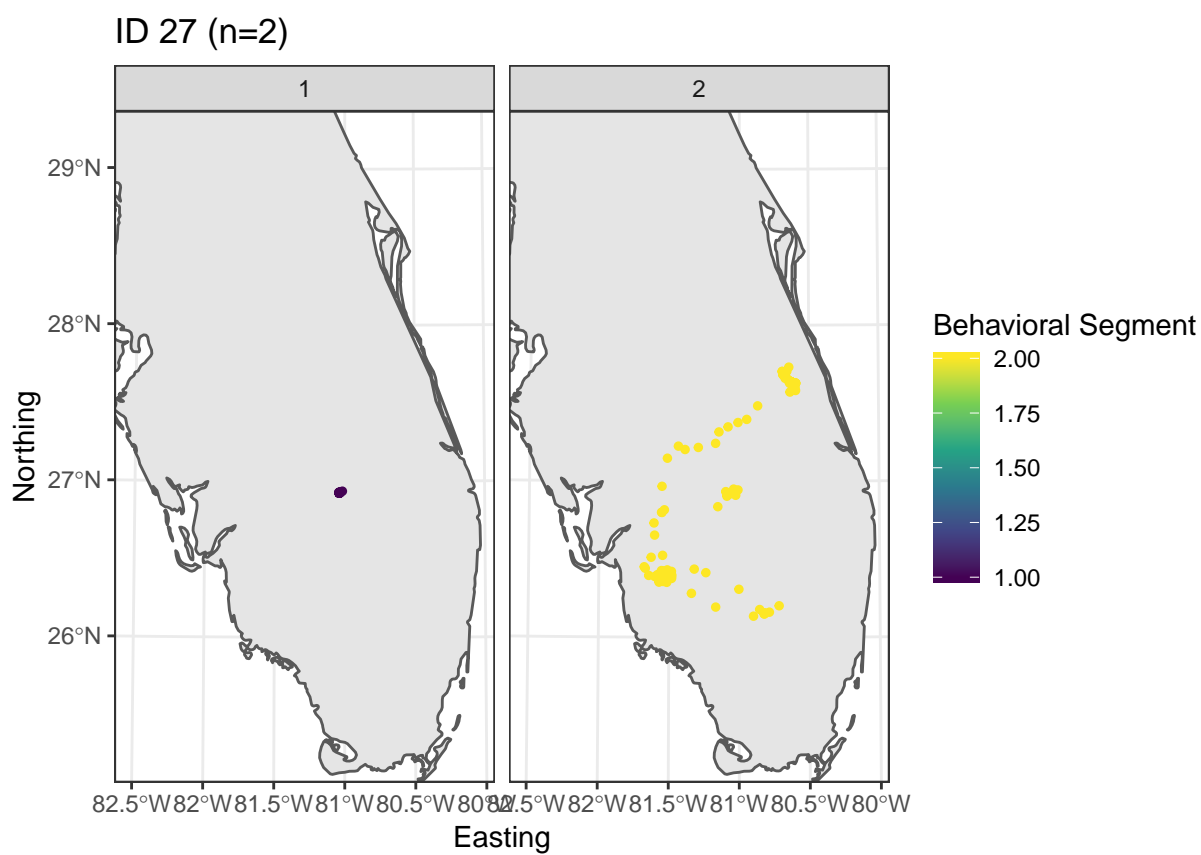
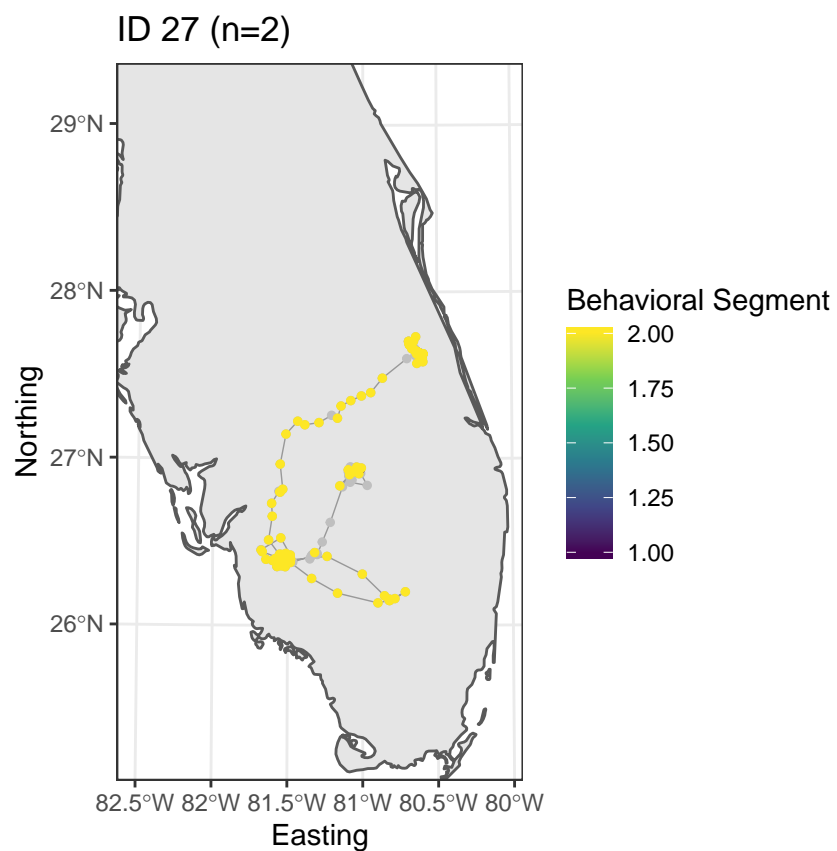
## Mapping the Model Output

Some of the following behavioral segments appear to match up well with movement patterns, while others appear to be aggregated. This also varies by individual and the duration of the track. For example, **ID 12** has 31 estimated behavioral segments, whereas **ID 27** only has 2.



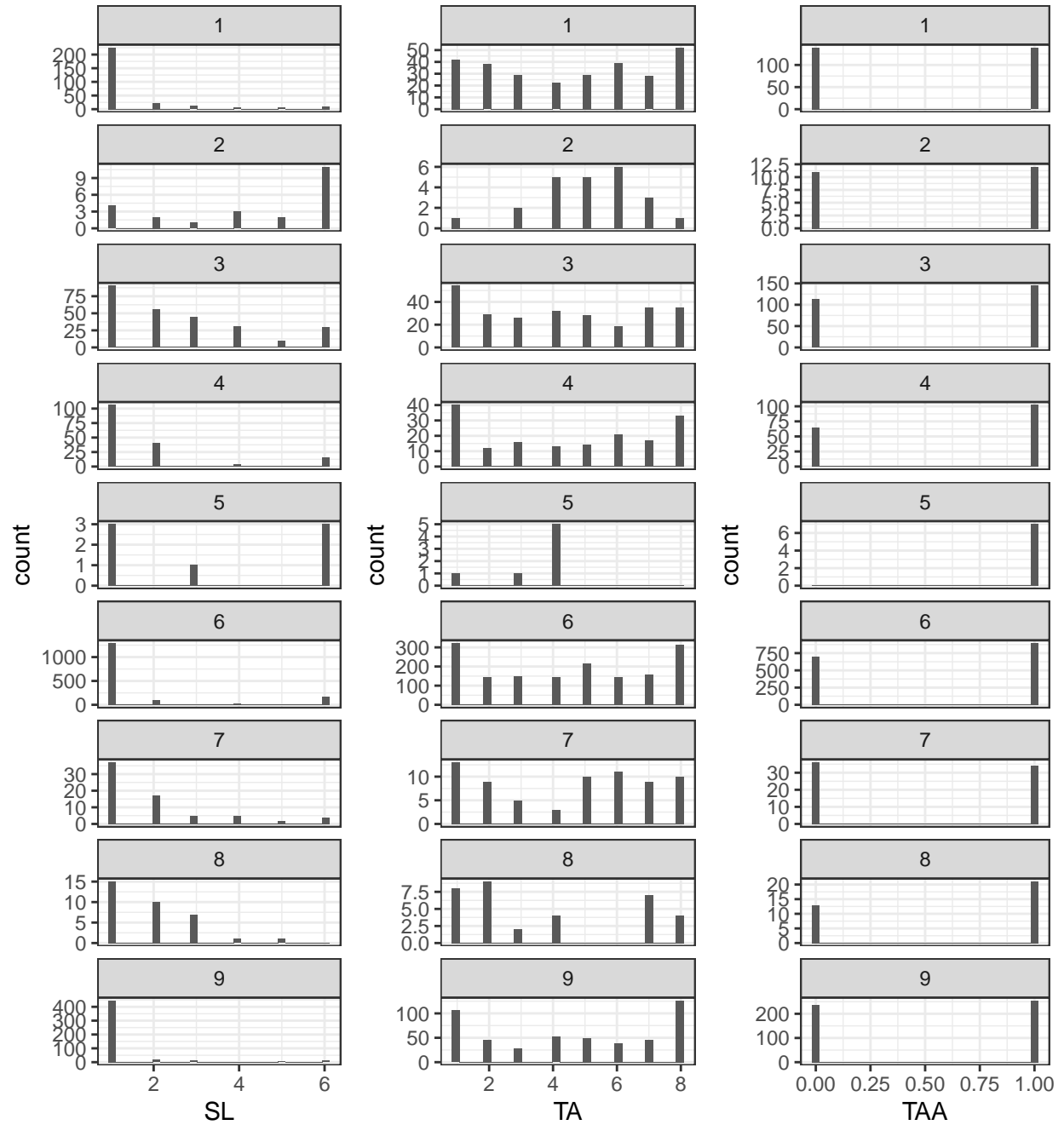




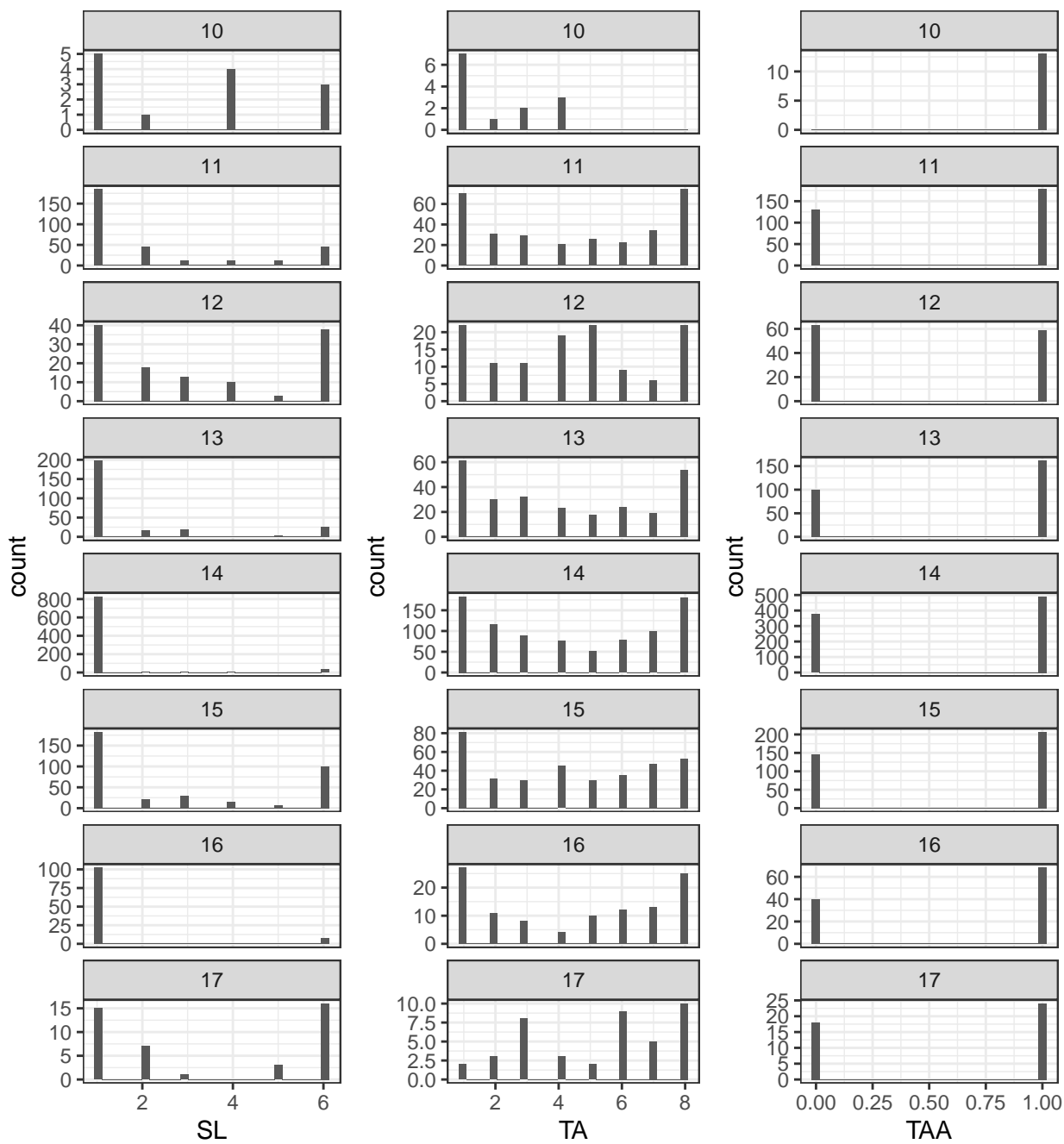


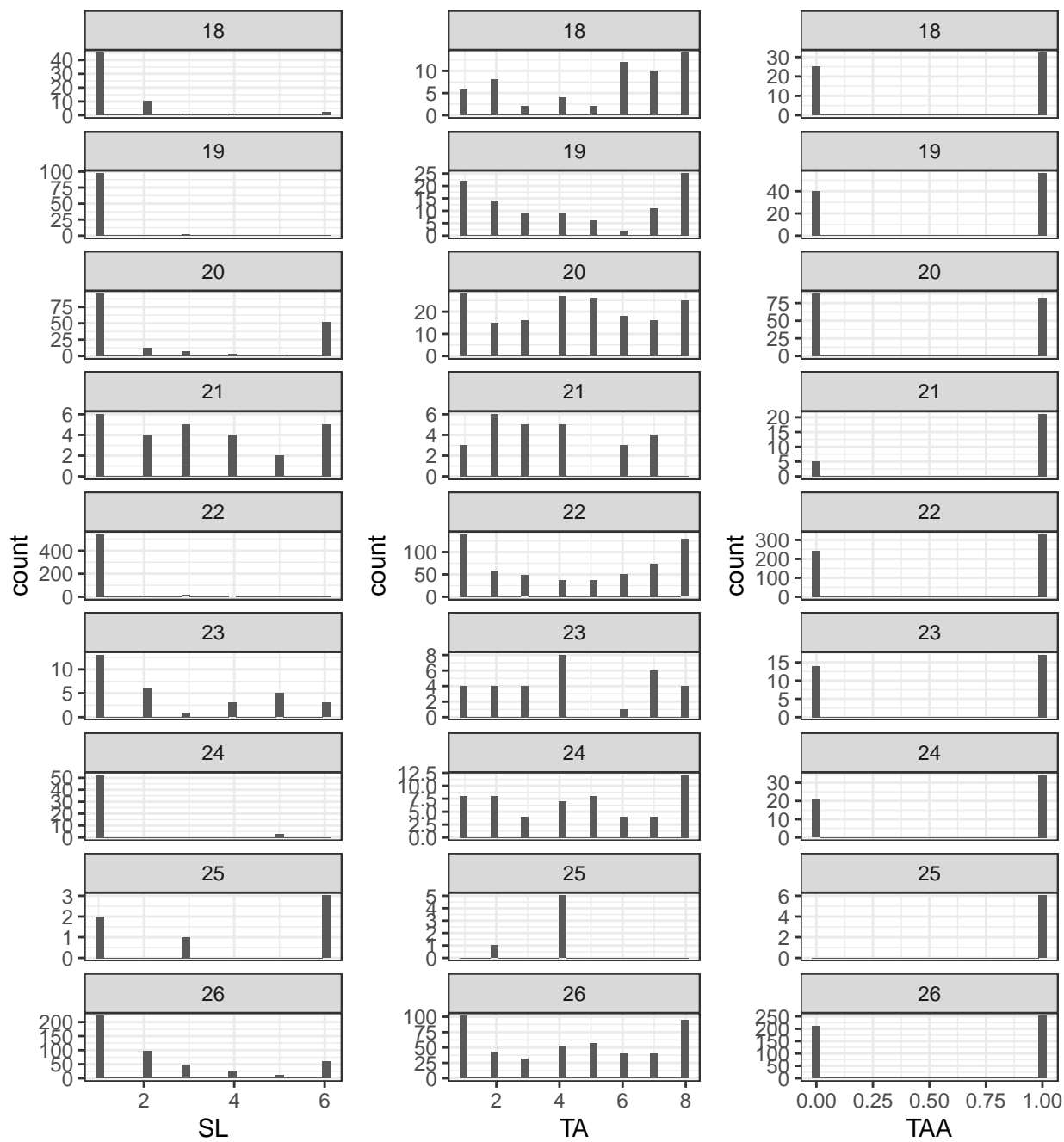
# Visualizing Distributions of Movement Parameters Among Time Segments

ID 1

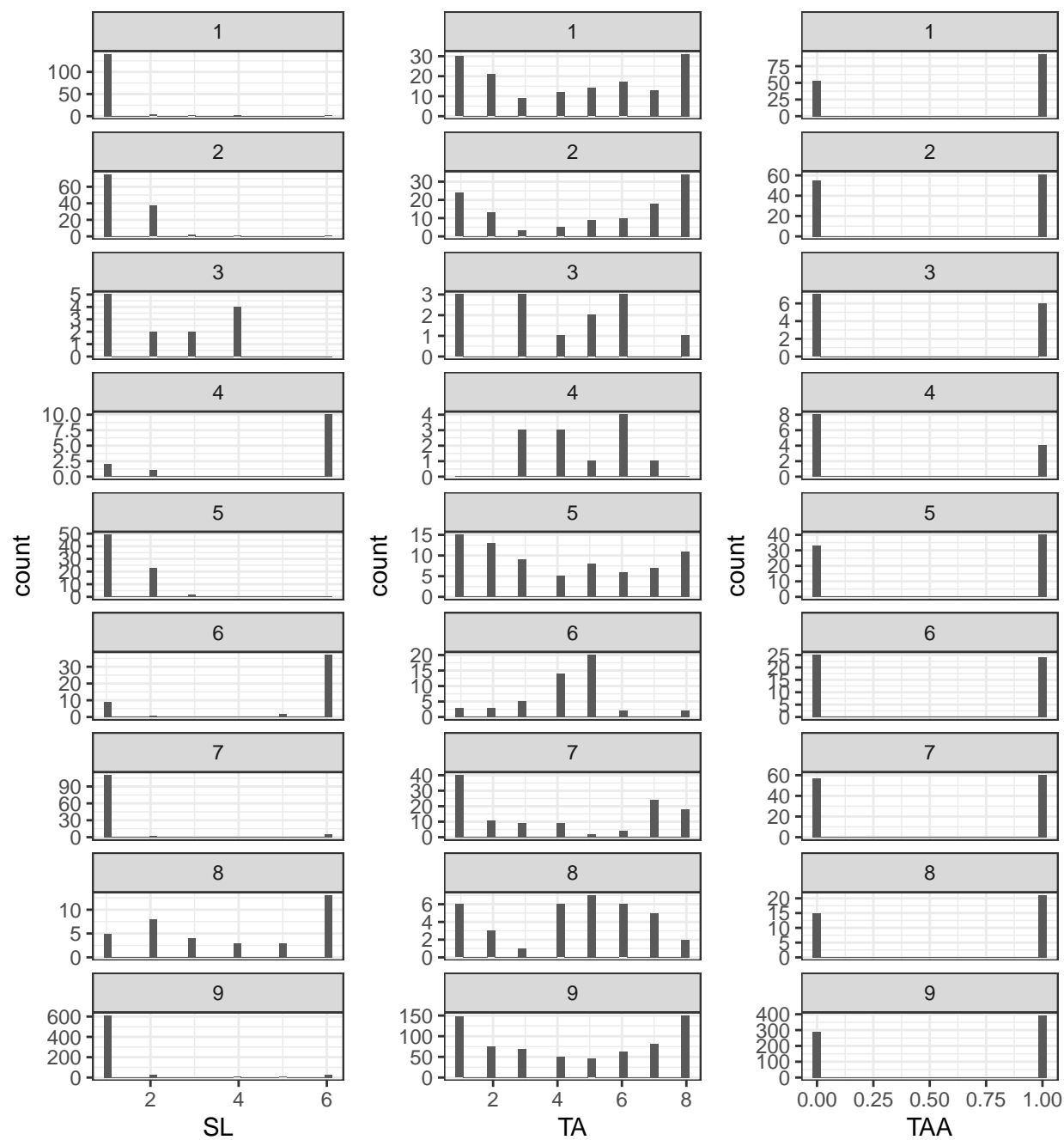


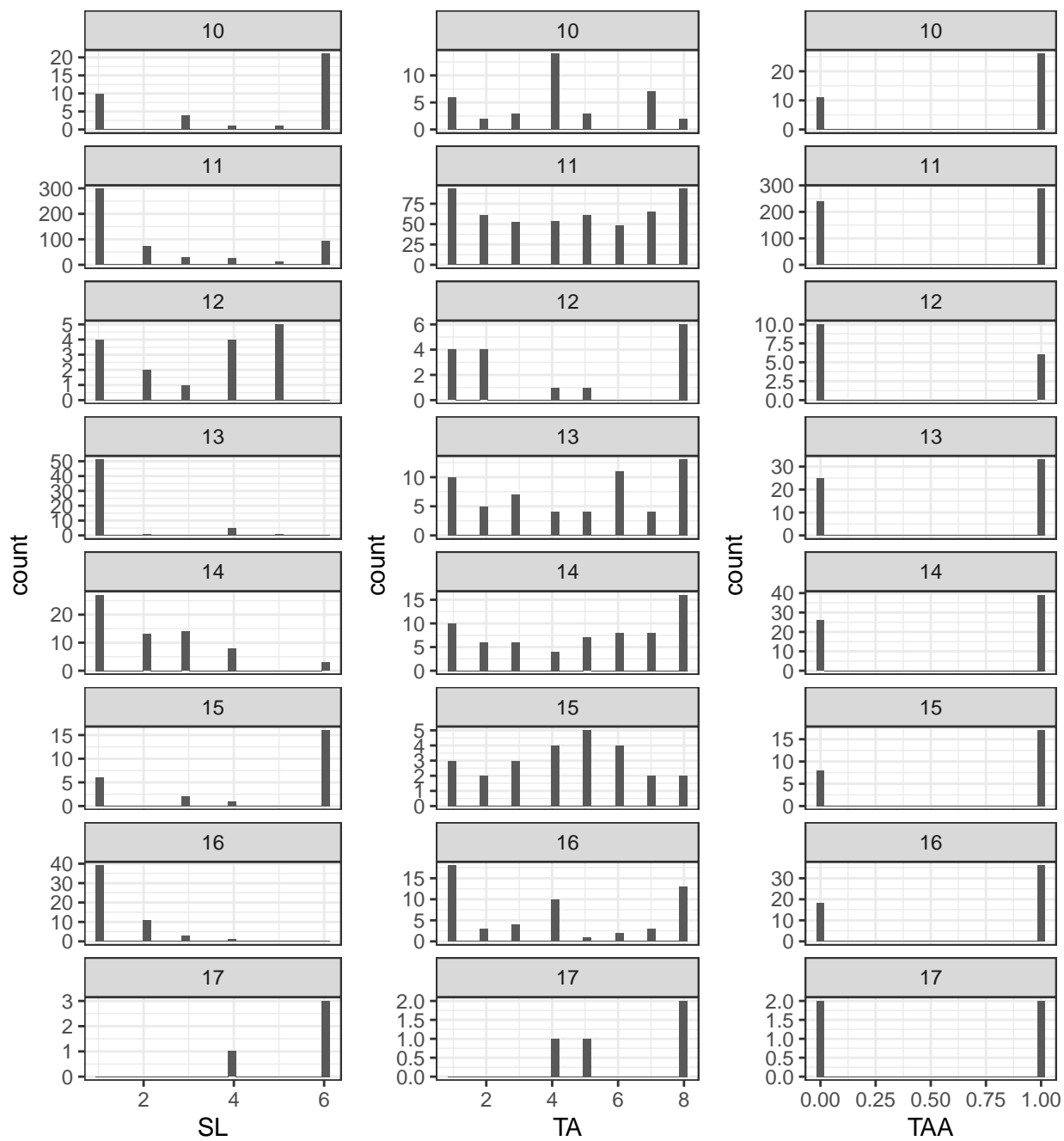


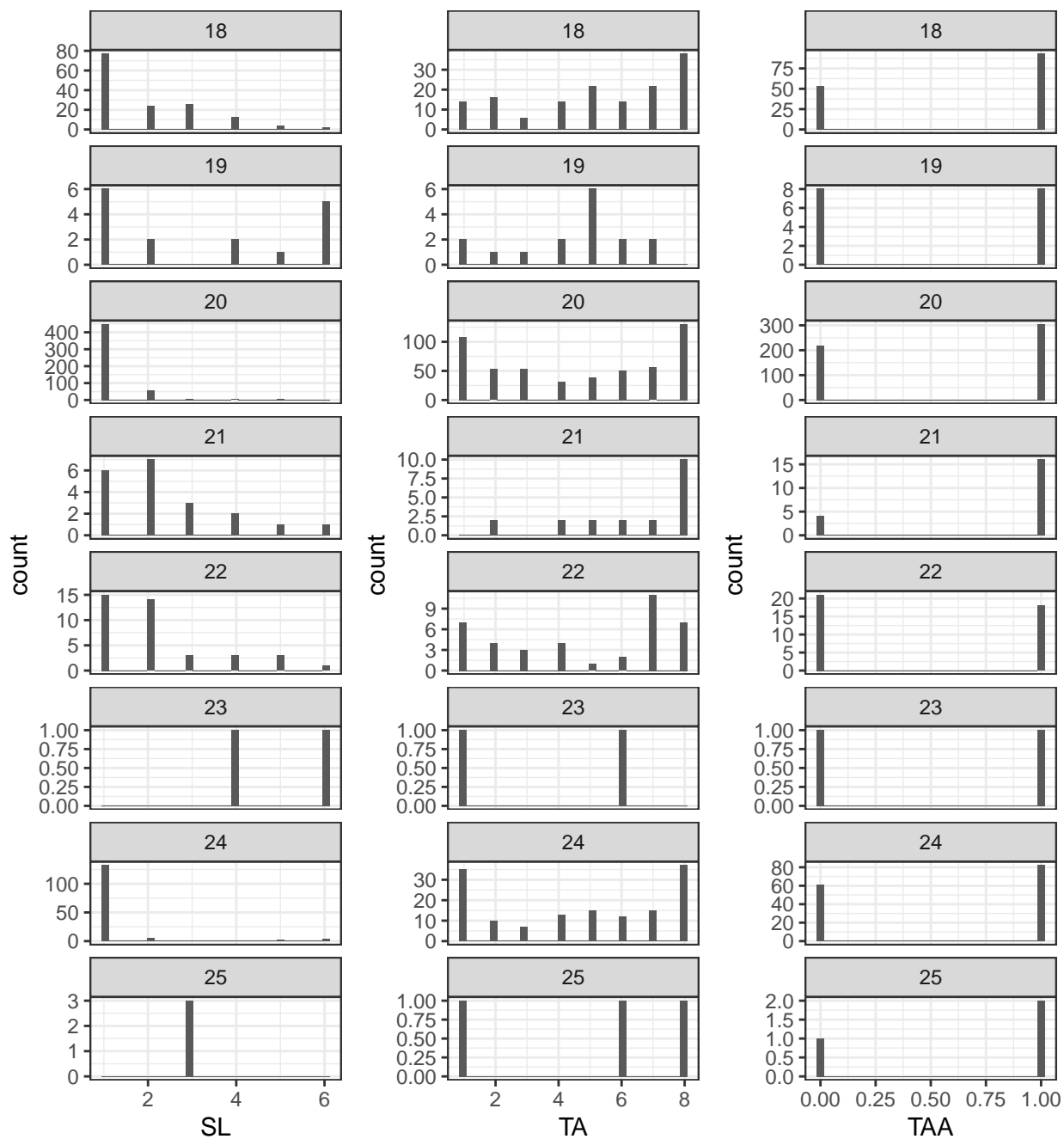


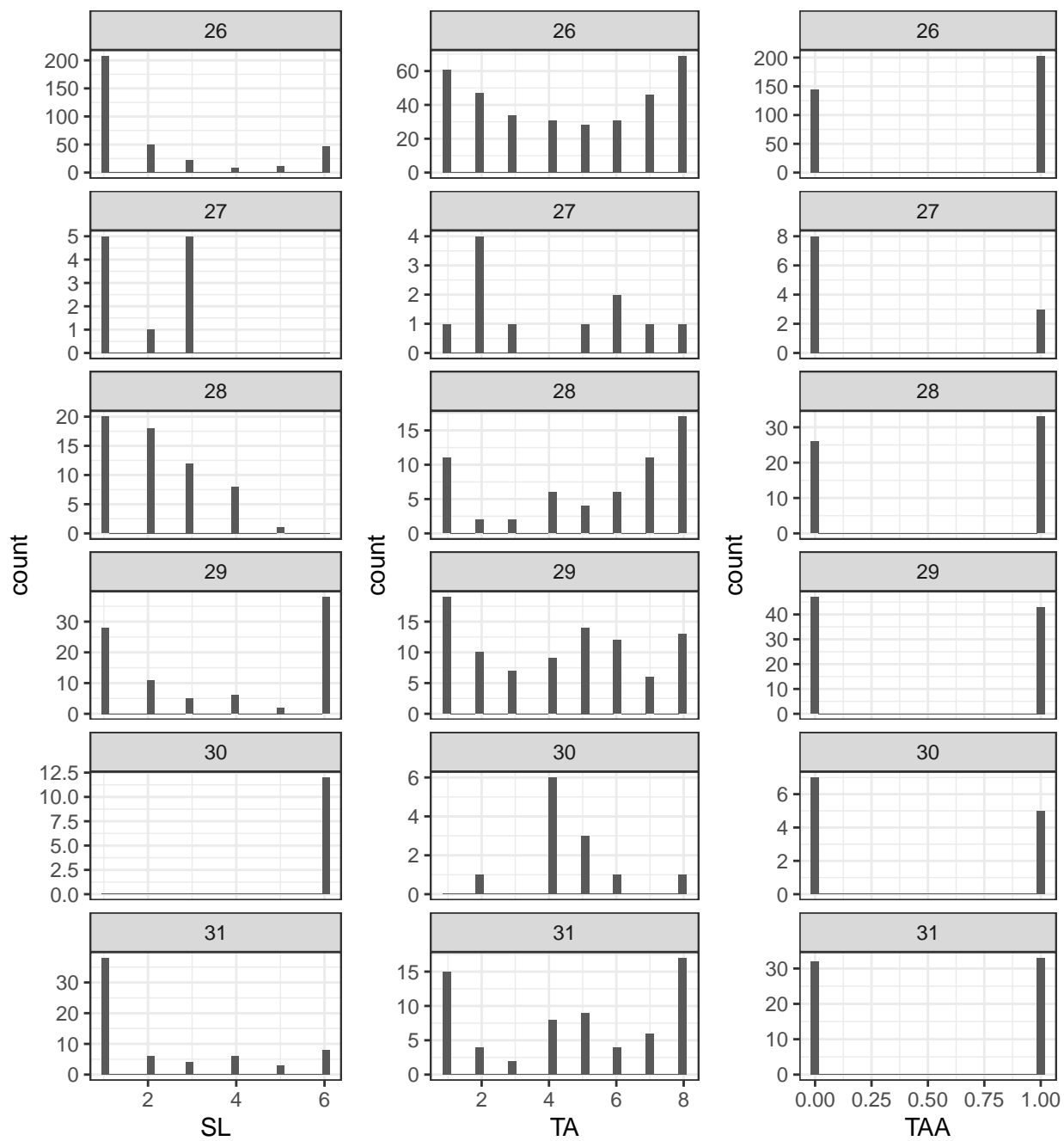


ID 12

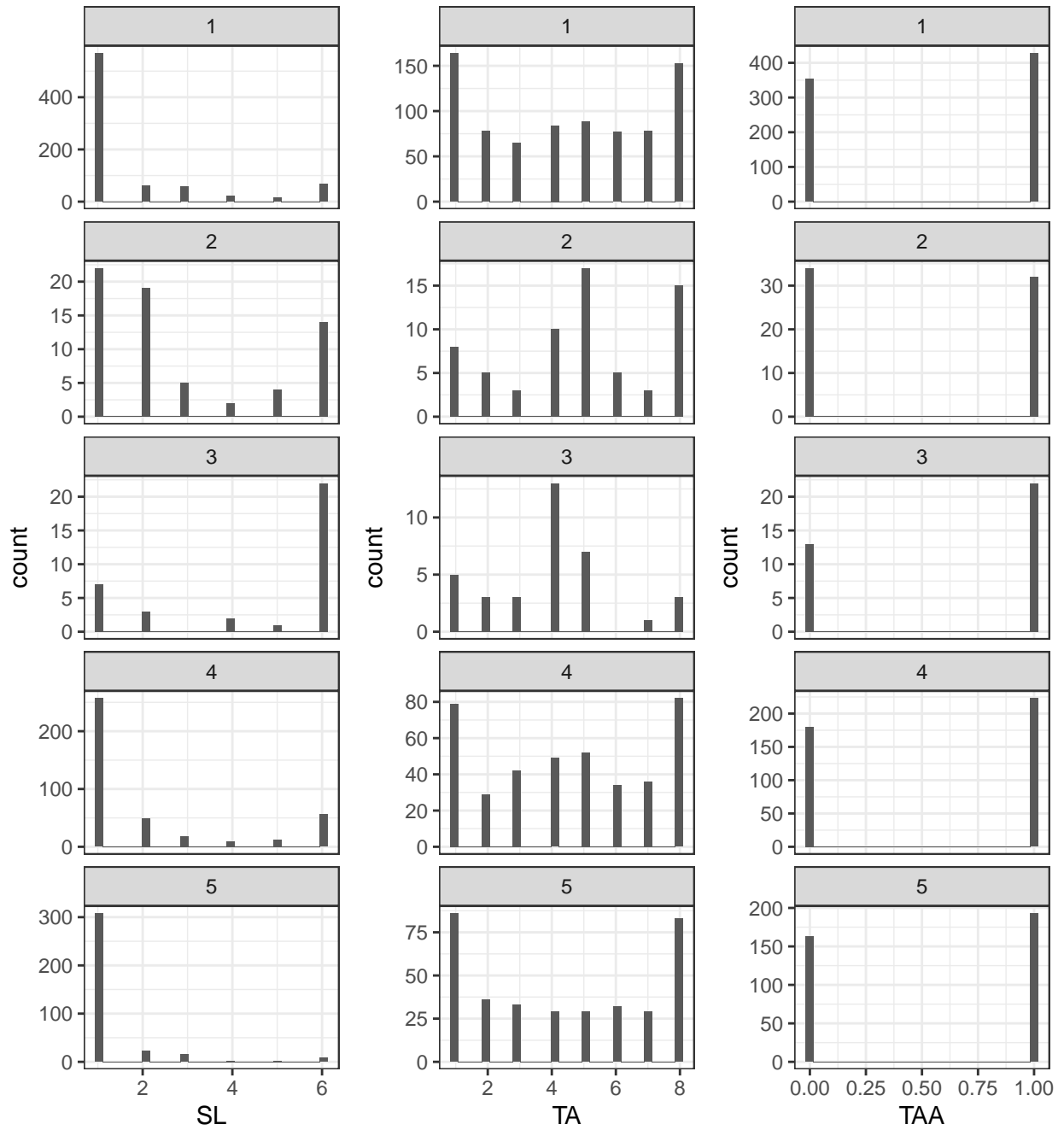








ID 19



ID 27

