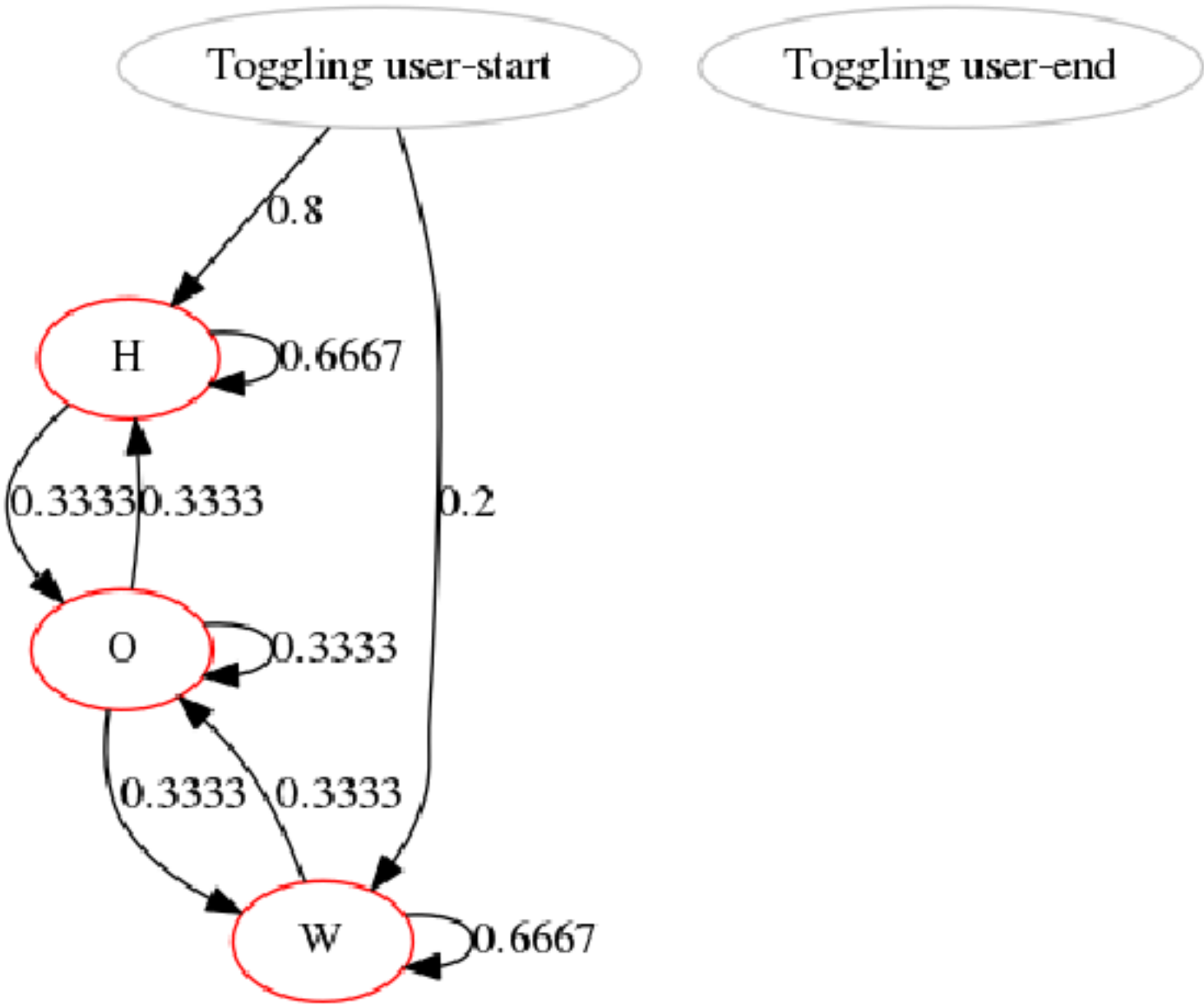


Example of failed model fit

Initial model was:



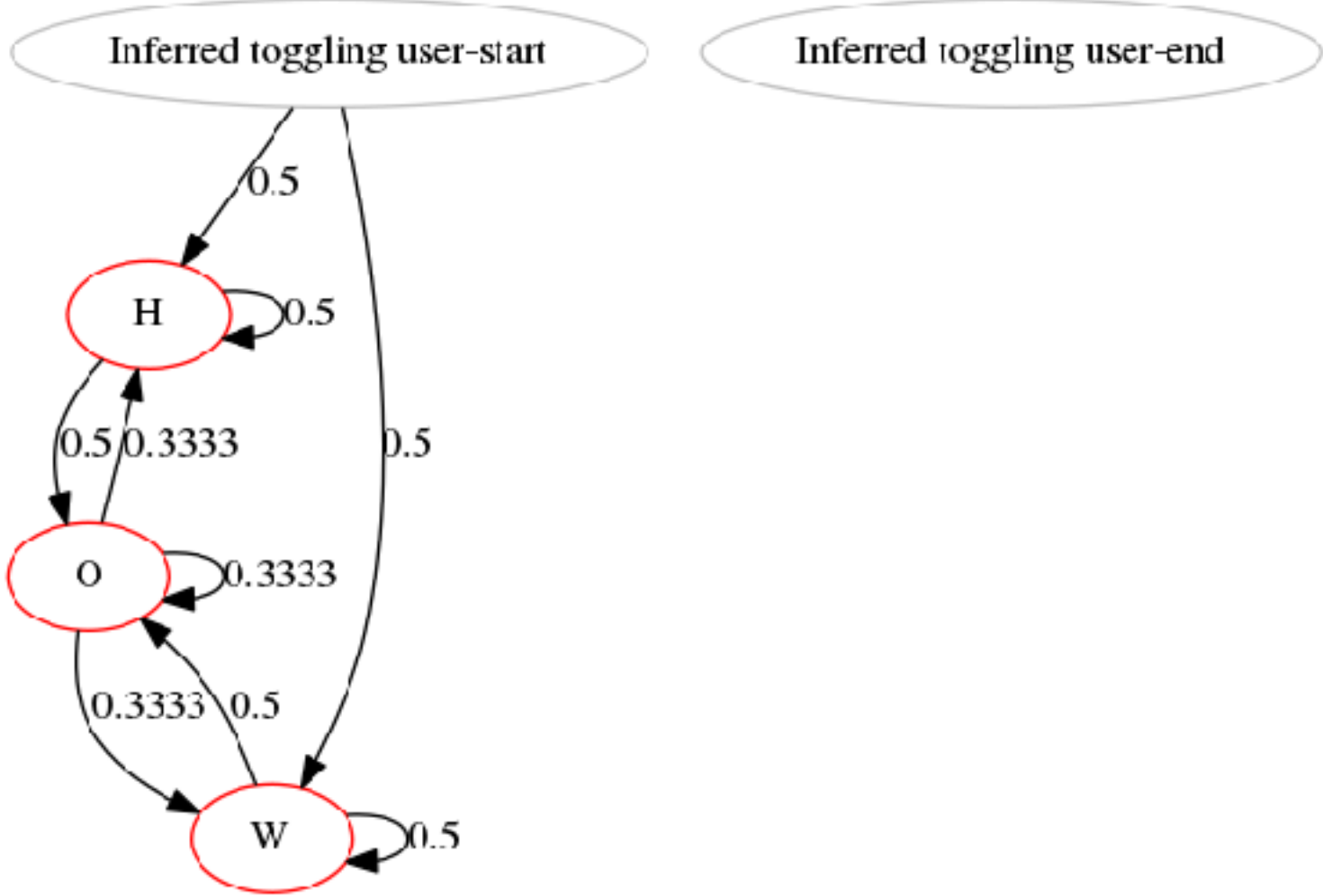
With following emission probabilities:

H { 'p': 0.4444444444444445, 'w': 0, 'none': 0.1111111111111105, 'h': 0.4444444444444445}  
O { 'p': 0.4444444444444445, 'w': 0, 'none': 0.5555555555555556, 'h': 0}  
W { 'p': 0.4444444444444445, 'w': 0.4444444444444445, 'none': 0.1111111111111105, 'h': 0}

We made a 1000 elements sample with the following distribution of observations:

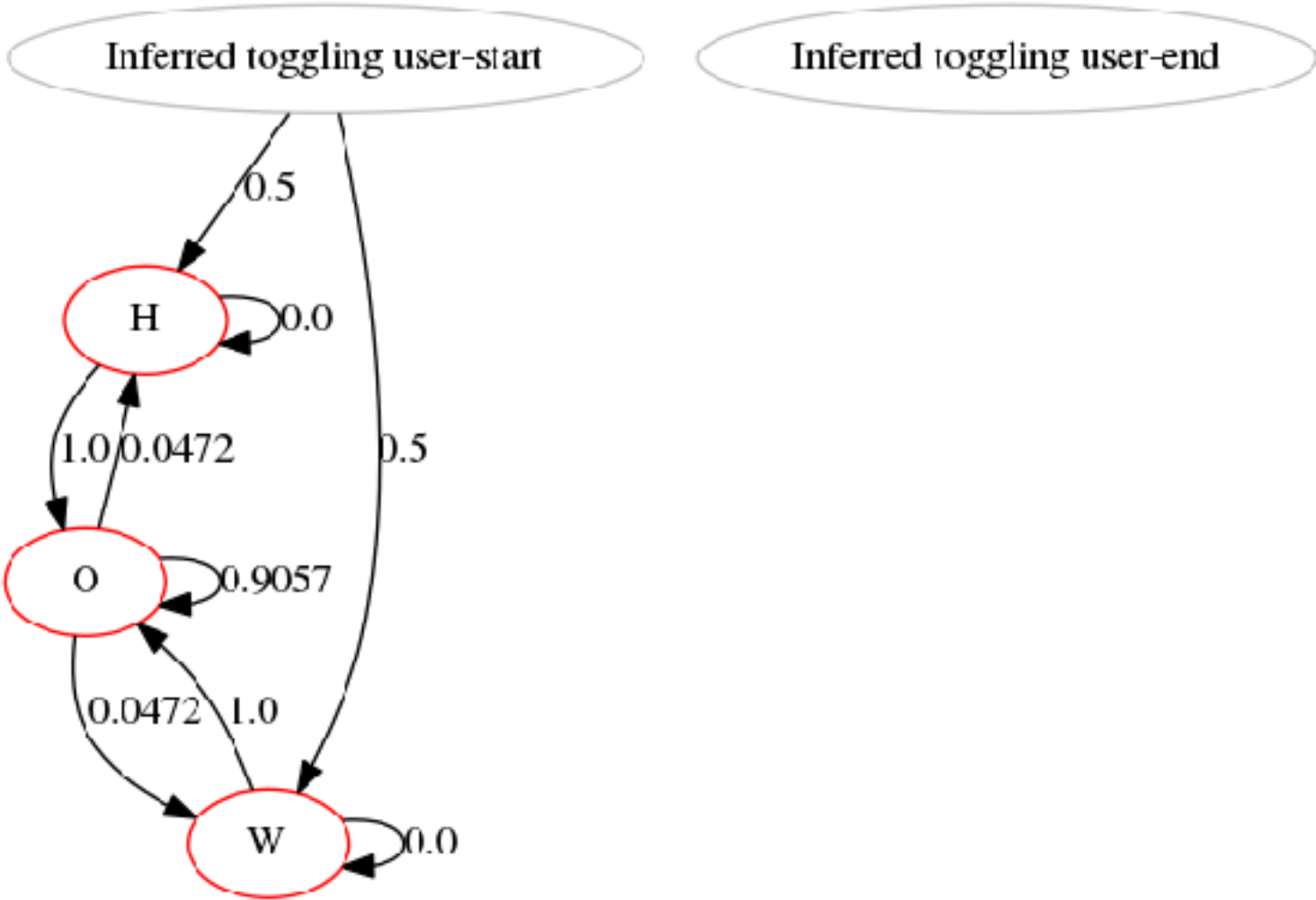
h 0.156  
none 0.273  
p 0.447  
w 0.124

And crafted an initial HMM with the following default probabilities:



H { 'p': 0.25, 'w': 0.25, 'none': 0.25, 'h': 0.25}  
O { 'p': 0.25, 'w': 0.25, 'none': 0.25, 'h': 0.25}  
W { 'p': 0.25, 'w': 0.25, 'none': 0.25, 'h': 0.25}

After fitting, we obtained the following:



H { 'p': 6.80326256632697e-33, 'w': 0.5154328423444966, 'none': 1.0396111583336217e-31, 'h': 0.4845671576555033}  
O { 'p': 0.4896132114431586, 'w': 0.08668409289347105, 'none': 0.299025518398175, 'h': 0.12467717726519532}  
W { 'p': 6.80326256632697e-33, 'w': 0.5154328423444966, 'none': 1.0396111583336217e-31, 'h': 0.4845671576555033}

Outside is more used than the other two states, with a big probability of emitting p (50%) and none (30%) then h and w (circa 10%). The other two states ( Work and Home ) are identical, and have a half-half probability of emitting w and h .

In conclusion: the two models do not look alike at all. We should investigate wether