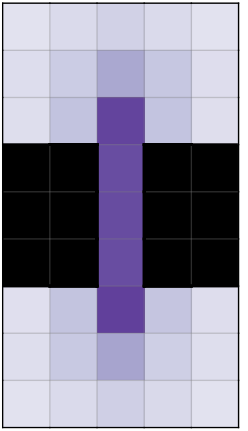
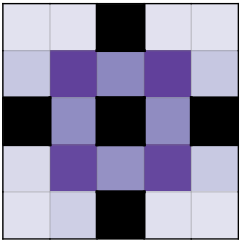
A

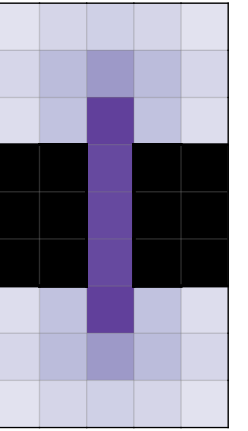
Final need

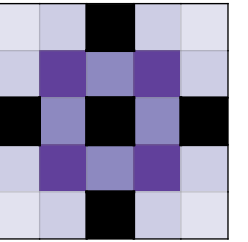




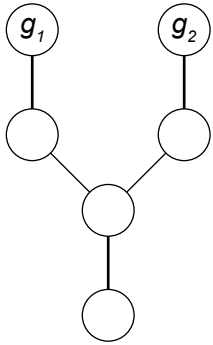
B

Betweenness centrality



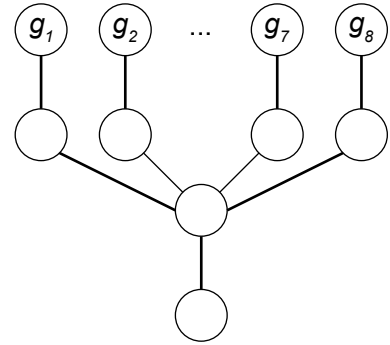


A



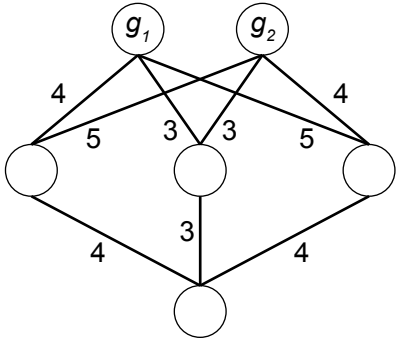
Carey model state diagram

B



Gillespie model state diagram

C



Prediction task model state diagram

Figure S1. Need metric captures important elements of environment topology, related to Figure 2. (A) Examples of final need, reproduced from Figure 2. (B) Betweenness-centrality computed for the bottleneck chamber (top) and the community graph maze (bottom).

Figure S2. State diagrams for the simulations in Figures 3, 4, and 6. (A) State diagram for our model of the Carey task (Figure 4). (B) State diagram for our model of the Gillespie task (Figure 3). (C) State diagram for our model of the prediction task (Figure 6). Numbers indicate distances (e.g., the left bottleneck state requires four steps to reach g_1), which are implemented through intermediate states (not shown).