

## Multimedia Appendix 1. Equations.

Equation 1.

$$LL(C|f_i) = \prod_{k=1}^{|C|-1} Pr(c_k \rightarrow c_{k+1})$$

Equation 2.

$$LL(\rho_{ij}) = \prod_{k=1}^{|\rho_{ij}|-1} Pr(\rho_{ij_k} \rightarrow \rho_{ij_{k+1}})$$

Equation 3.

$$Cr(M_{ij}) = \prod_{k=1}^{|M_{ij}|} g(M_{ij_k})$$

Mapping

$$\begin{array}{ll} \text{insert (shower, on)} \xrightarrow{g} 0.9 & \text{insert (shower, off)} \xrightarrow{g} 0.9 \\ \text{insert (pill, on)} \xrightarrow{g} 0.2 & \text{swap ((breakfast, on), (pill, on))} \xrightarrow{g} 0.4 \end{array}$$

Equation 4.

$$\phi_i = \max_{\rho_{ij}} \frac{LL(\rho_{ij})}{Cr(M_{ij})}$$