$$P^{\alpha}_{\bar{o}}(t_a|t_o) \propto P_a(t_a)P^{\alpha}_o(t_o|t_a)$$

$$P^{\alpha}_{\sigma}(m|t_a) = \sum_{t_o} P^{\alpha}_o(t_o|t_a)\sigma^{\alpha}(m|t_o)$$

$$P^{\alpha}_{\rho}(t_r|m) = \sum_{t_i} P^{\alpha}_r(t_r|t_i)\rho^{\alpha}(t_i|m)$$

$$P^{\alpha}_{\bar{\sigma}}(t_a|m) \propto P_a(t_a)P^{\alpha}_{\sigma}(m|t_a)$$

$$\mathrm{EU}^{\alpha}_{\sigma}(m, t_o, \rho^{\star}) = \sum_{t_a} P^{\alpha}_{\bar{o}}(t_a|t_o) \sum_{\alpha' \in A} P(\rho^{\alpha'}) \sum_{t_r} P^{\alpha'}_{\rho}(t_r|m)U(t_a, t_r)$$

$$\mathrm{EU}^{\alpha}_{\rho}(t_i, m, \sigma^{\star}) = \sum_{\alpha' \in A} P(\sigma^{\alpha'}) \sum_{t_a} P^{\alpha'}_{\bar{\sigma}}(t_a|m) \sum_{t_r} P^{\alpha}_r(t_r|t_i)U(t_a, t_r)$$

$$P^{\alpha}_o(m|t_o) = \sum_{t_a} P^{\alpha}_{\bar{o}}(t_a|t_o) \sum_{\alpha' \in A} P(\sigma^{\alpha'})P^{\alpha'}_{\sigma}(m|t_a)$$

$$P^{\alpha}_o(t_o|m) = \sum_{t_r} P^{\alpha}_o(t_o|t_r) \sum_{\alpha' \in A} P(\rho^{\alpha'})P^{\alpha'}_{\rho}(t_r|m)$$

$$\sigma^{\alpha}_{i+1}(m|t) = P^{\alpha}_o(m|t)EU^{\alpha}_{\sigma_i}(m, t, \rho^{\star}_i)$$

$$\rho^{\alpha}_{i+1}(t|m) = P^{\alpha}_o(t|m)EU^{\alpha}_{\rho_i}(t, m, \sigma^{\star}_i)$$