

## Supplemental Analysis

This section provides theoretical analysis of meta-cognitive frameworks, their implications, and theoretical extensions of the Active Inference meta-pragmatic framework.

### Meta-Cognitive Framework Analysis

#### Hierarchical Meta-Cognition

The framework supports three levels of meta-cognitive processing:

**Level 1 Meta-Cognition:** Monitoring basic inference processes - Confidence assessment in posterior beliefs - Attention allocation based on uncertainty - Strategy selection for inference tasks

**Level 2 Meta-Cognition:** Monitoring meta-cognitive processes themselves - Evaluating confidence assessment accuracy - Monitoring attention allocation effectiveness - Assessing strategy selection performance

**Level 3 Meta-Cognition:** Framework-level monitoring and adaptation - Optimizing confidence thresholds - Adapting meta-cognitive parameters - Evolving framework structures

#### Self Modeling Requirements