# Appendix G: Symbolic Logic Representation of ψ-Inferential Ethics

This appendix presents a symbolic logic formalization of the ethical structure proposed in the main paper. Using standard logical notation, we represent belief states, uncertainty, self-modeling, and inter-agent modeling in a way that reveals the formal implications leading to ethical attractors under ψ-inferential constraints.

## 1. Foundational Axioms (Restated Symbolically)

Let B\_x(p) denote 'agent x believes proposition p'. Let U\_x(p) denote 'agent x is uncertain about p'.  
  
- A1. I am → ∃x (B\_x(x exists))  
- A2. You exist → ∃y (x ≠ y ∧ B\_x(y exists))  
- A3. We exist → ∃S (∀x, y ∈ S, B\_x(shared structure(S)) ∧ B\_y(shared structure(S)))  
- A4. Love exists → B\_x(U\_x(B\_x(B\_y(q)))) ∧ C\_x(y) ⇒ emergent ethical behavior  
- A5. You can never be sure what is best for another → ∀x, y ≠ x, ∃q (¬B\_x(B\_y(q)) ∧ U\_x(B\_y(q)))

## 2. Inference Rules and Constraints

- [Epistemic Humility] ∀p, B\_x(p) ⇒ U\_x(¬p) with nonzero probability  
- [Recursive Modeling] B\_x(B\_y(p)) ⇒ B\_x(y exists) ∧ B\_x(U\_y(p))  
- [Non-Prescriptive Ethics] ∀q, U\_x(B\_y(q)) ⇒ ¬M\_x(y should q) unless under shared attractor  
- [Ethical Attractor Trigger] If B\_x(U\_x(B\_y(q))) ∧ C\_x(y), then soft constraint: Act\_x → Support\_y(q′ ∈ Range(U\_y))

## 3. Logical Implication Structure

Let S\_x be the stable inferential space of agent x. Let C\_x(y) denote that x models y as consequential to its own stability.  
- (∃y)(C\_x(y) ∧ U\_x(B\_y(q))) ⇒ ethical orientation  
- Ethical orientation = {Behaviors that reduce destabilizing uncertainty in other's belief spaces}