



The Newborn's First Cry as Epistemic Claim and Foundation of Psychological Development

Attachment, Autonomy, and Resilience

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Abstract

This paper develops a foundational theoretical account of the newborn's first cry as the earliest epistemic act and the crucible of psychological development. Rather than treating crying as reflex, it is reframed as an epistemic event: the embodied registration of contradiction at the threshold of life. The caregiver's response constitutes the first fiduciary scaffold. Recognition transforms dissonance into resilience, while neglect, silencing, or inconsistency rehearse the logic of epistemic clientelism. To formalise these dynamics, the *Kahl Model of Epistemic Dissonance* (KMED) is extended into an infant-caregiver setting and implemented in Python-based simulations. These simulations function not as empirical data analysis but as conceptual scaffolding—stylised formalisations that make explicit how caregiving policies generate divergent developmental trajectories of epistemic autonomy, dissonance tolerance, and dependence. In so doing, the paper establishes infancy as the crucible of epistemic life, reframes attachment as epistemic trust, and repositions psychology and psychiatry as fiduciary sciences of recognition and contradiction.

Keywords

cognitive dissonance, newborn crying, infancy, epistemic psychology, fiduciary care, epistemic clientelism, attachment theory, developmental psychology, epistemic event, resilience, recognition, silencing, parental scaffolding, epistemic autonomy, dependence, dissonance tolerance, computational modelling, psychiatry, epistemic trust, clinical psychology, ontology of infancy

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1. Introduction: Why the First Cry Matters

1.1 Psychology's Treatment of Dissonance as Bias/Pathology

The canonical point of departure for dissonance research is Leon Festinger's *A Theory of Cognitive Dissonance* (1957). Festinger proposed that when individuals hold inconsistent cognitions, they experience an aversive, drive-like state—cognitive dissonance—that motivates them to reduce the inconsistency. This formulation became one of the most influential theories in social psychology, generating decades of research on attitude change, decision-making, and self-justification.

In its traditional framing, dissonance was treated as a maladaptation or irrational bias: a deviation from rational order that required correction. Festinger's model positioned dissonance as an uncomfortable error signal in an otherwise rational cognitive system. Aronson (1968) shifted the mechanism toward the self-concept, and Steele (1988) toward self-affirmation, but both refinements preserved the same deficit logic: dissonance was destabilising and ultimately undesirable, a problem to be managed away.

This orientation reflected the residue of mid-20th-century behaviourism. Festinger's drive-reduction language echoed Hull's learning theory (1943), where aversive states were conceived as triggers for corrective behaviour. In this lineage, dissonance remained a deviation from equilibrium, not a constitutive feature of cognition.

Later critiques began to soften this view. Harmon-Jones and Harmon-Jones (2007) recast dissonance as an approach-oriented state, motivating action rather than paralysis. Cooper (2007) and Vaidis and Bran (2019) debated whether dissonance should be understood as bias, anomaly, or adaptive mechanism. Yet even as the theory diversified, the field continued to cast dissonance in terms of error correction.

One omission persists: infancy. The overwhelming focus of dissonance research has been on adults, with extensions into childhood only emerging in the past two decades. The earliest months of life—before choice, language, or self-concept—remain virtually unaddressed, as if dissonance begins only once reflective cognition is available. If dissonance is in fact structural rather than anomalous, it must appear earlier. This paper pursues that hypothesis by returning to the very beginning: the newborn's first cry.

1.2 Developmental Omission – Infancy Rarely Included in Dissonance Research

For most of its history, cognitive dissonance research has focused almost exclusively on adults. Festinger's original formulation (1957) and the vast majority of subsequent experiments examined how individuals justify choices, rationalise attitudes, or resolve conflicting beliefs. Only gradually did the theory extend into developmental contexts.

A landmark study by Egan, Santos, and Bloom (2007) showed that children, and even capuchin monkeys, display choice-induced preference shifts: after rejecting one of two equally attractive options, they later avoided the unchosen item. This suggested that dissonance reduction emerges early in ontogeny and extends deep into phylogeny. More recently, Silver et al. (2020) demonstrated that preverbal infants, when choosing between equally attractive toys, subsequently avoided the unchosen toy, indicating preference change even before language. Grosse Wiesmann et al. (2022) extended this trajectory, showing that toddlers around two years of age also exhibit blind-choice dissonance, shifting preferences even when initial choices are made without foreknowledge of the options.

Together, these studies sketch a developmental progression: from simple choice-induced preference in infancy to more complex blind-choice dissonance in toddlerhood. Yet the scope remains narrow. Dissonance has been examined only in the context of explicit choice tasks, where preferences are inferred from object selection. Pre-choice manifestations—embodied, affective signals of contradiction such as crying, distress, or agitation—have been overlooked.

This omission is striking. The first months of life remain conceptually absent from dissonance theory, as if the absence of overt choice rendered infants epistemically irrelevant. Yet if dissonance is truly structural, as later critiques suggest, it should be observable even before choices are possible. This paper pursues that claim by reframing the newborn's first cry as the primordial dissonance event.

1.3 Thesis – The First Cry as the Primordial Epistemic Event

The newborn's cry constitutes the earliest epistemic act. In this moment, contradiction, helplessness, and finitude converge: the infant registers a mismatch between embodied state and environment yet lacks the means to resolve it independently. The cry is the embodied expression of this contradiction.

Although anchored in physiology—respiratory control, autonomic arousal, neural responses to discomfort—the cry's significance exceeds reflex. It is epistemic because it voices mismatch: hunger unmet, a sudden cold draught, intrusive light, or the unfamiliar presence of another. The cry externalises contradiction, projecting it into the world as a claim that demands a response.

Crucially, the cry is not solitary but relational. It summons the caregiver, embedding contradiction in an epistemic exchange. Soltis (2004) shows that crying functions as a graded signal reliably eliciting proximity and care, while Takada (2021) demonstrates how !Xun San caregivers reframe cries of distress into playful interaction. These findings reveal that contradiction becomes meaningful only through the caregiver's fiduciary or clientelist response—comfort, neglect, or silencing.

The epistemic weight of this moment is profound. The caregiver's policy does more than regulate distress: it scripts the infant's epistemic repertoire. Fiduciary recognition scaffolds resilience; neglect rehearses avoidance; silencing instils submission. In this way, attachment categories become epistemic scripts—early lessons about whether contradiction is dignified or collapsed.

This analysis extends my earlier claim that dissonance is not anomaly or pathology but the grammar of social life (Kahl, 2025a). The first cry is the primordial modality of epistemic dissonance: affective, communicative, and relational. It inaugurates the co-constitution of autonomy and dependence that underpins human development, and it is here that the grammar of epistemic life begins.

1.4 Contributions of the Paper

This paper advances five interrelated contributions:

Conceptual. It reframes cognitive dissonance as an epistemic event rather than a maladaptive bias. By treating the newborn's cry as the first dissonance event, it shows that autonomy and dependence emerge together. Contradiction becomes survivable because recognition transforms it into resilience. In this sense, dissonance is not error but script: it inscribes lessons about whether contradiction can be voiced, ignored, or punished.

Developmental. It reinterprets attachment theory through an epistemic lens. Soltis (2004) and Takada (2021) show how crying functions as signal and cultural practice, while Leerkes et al. (2009), Groh et al. (2019), Hepworth et al. (2021), and Northrup et al. (2024) demonstrate the impact of maternal sensitivity and co-regulation. Synthesised with simulation results, attachment styles are recast as epistemic lessons: secure = contradiction dignified; avoidant = silence as survival; ambivalent = fragile signalling; disorganised = incoherent trust.

Computational. It extends the *Kahl Model of Epistemic Dissonance* (KMED) into infancy via KMED-I. Simulations formalise how fiduciary, inconsistent, neglectful, or silencing policies generate distinct trajectories of EA, DT, and D. Parameter sweeps for λ (relief efficacy) and π (punitive suppression) reveal thresholds where resilience consolidates or collapses. These runs make explicit what remains implicit in observation.

Normative. It interprets caregiving responses as fiduciary acts. Recognition scaffolds contradiction into resilience, while silencing or neglect rehearse epistemic clientelism. This fiduciary framing extends into clinical and therapeutic practice: parental embodied mentalising predicts infant development (Shai et al., 2022), and therapeutic touch fosters resilience via active inference (McParlin et al., 2023).

Scholarly payoff. By integrating conceptual, developmental, computational, and normative strands, the paper establishes epistemic psychology as a new field. Infancy, long neglected in dissonance research, is repositioned as the crucible of epistemic life. Autonomy and dependence are revealed not as opposites but as co-constituted from the first cry under epistemic conditions, extending arguments in *Cognitive Dissonance as Epistemic Event* (Kahl, 2025a) and *Re-founding Psychology as Epistemic Psychology* (Kahl, 2025b).

1.5 Roadmap of the Paper

The argument unfolds across eight chapters.

Chapter 2 situates cognitive dissonance as an epistemic event, reviewing its classical framing in psychology alongside recent empirical and philosophical work. This establishes the conceptual groundwork for treating dissonance as structural rather than anomalous.

Chapter 3 develops infancy as the crucible of epistemic life. Drawing on evolutionary perspectives on crying (Soltis, 2004), cross-cultural caregiving practices (Takada, 2021), and attachment sensitivity research, it reframes the newborn's cry as the first locus of epistemic contradiction.

Chapter 4 contrasts fiduciary and clientelist pathways in parental responses. Evidence from attachment and sensitivity studies (e.g., Leerkes et al., 2009; Groh et al., 2019; Hepworth et al., 2021; Northrup et al., 2024) demonstrates how comfort fosters resilience while neglect or silencing rehearses epistemic dependence.

Chapter 5 formalises these dynamics through the Kahl Model of Epistemic Dissonance in infancy (KMED-I). It presents simulation results showing how distinct caregiver policies shape trajectories of dissonance tolerance, epistemic autonomy, and dependence.

Chapter 6 explores implications for developmental psychology, psychiatry, and clinical practice. It integrates findings on parental embodied mentalising (Shai et al., 2022) and therapeutic touch in neonatology (McParlin et al., 2023) to demonstrate how early fiduciary scaffolds—or their breaches—reverberate across the lifespan.

Chapter 7 opens the philosophical horizon. It argues that autonomy and dependence are co-constituted from the very first cry, situating this claim within a broader normative framework that emphasises fiduciary scaffolds as conditions of epistemic dignity.

Chapter 8 concludes with cross-disciplinary implications. It shows how recognising the cry as an epistemic event reshapes our understanding of psychology, psychiatry, and governance, and closes with a call to dignify dissonance as the foundation of epistemic life.

2. Cognitive Dissonance as Epistemic Event

2.1 Festinger's Theory and Its Behavioural Framing

The canonical foundation of dissonance research remains Leon Festinger's *A Theory of Cognitive Dissonance* (1957). Festinger proposed that when an individual holds inconsistent cognitions, or when behaviour conflicts with belief, the result is an aversive drive-like state—cognitive dissonance—that the person is motivated to reduce. In this account, dissonance is akin to hunger or thirst: an unpleasant disequilibrium pressing the individual towards resolution.

The strength of Festinger's proposal was that it generated a durable research programme. Classic experiments in the late 1950s and 1960s demonstrated its reach. In forced-compliance studies, participants induced to lie for minimal reward later adjusted their attitudes to align with their behaviour. In free-choice paradigms, participants justified decisions by enhancing the attractiveness of chosen options and devaluing those rejected. Across these settings, the empirical pattern was consistent: dissonance was treated as an uncomfortable tension state, and individuals sought to relieve it.

This framing bore the imprint of mid-century behaviourism. Festinger's language of "drive" and "reduction" echoed Hullian learning theory, in which aversive states triggered corrective responses. Dissonance thus appeared as a deviation from cognitive equilibrium, a psychological error signal that had to be eliminated to restore rational balance.

Later refinements preserved this deficit-oriented emphasis. Aronson (1968) argued that dissonance arises when behaviour threatens a person's sense of self as competent or moral, exemplified in "hypocrisy" paradigms where participants who publicly endorsed safe sex but privately failed to practise it changed behaviour to reduce tension. Steele (1988) developed self-affirmation theory, showing that individuals reduce dissonance by bolstering unrelated aspects of self-worth—for example, affirming values to neutralise the discomfort of inconsistency. Both models broadened the scope of dissonance theory but left intact its underlying logic: dissonance was a problem to be corrected, an anomaly within an otherwise rational system.

More recent work has begun to question this framing. Harmon-Jones and Harmon-Jones (2007) reinterpreted dissonance as an approach-motivated state that prepares action rather than paralysing it, while reviews by Cooper (2007) and Vaidis and Bran (2019) debate whether dissonance should still be understood as a bias or rather as a fundamental mechanism of adaptation. These critical voices point to a conceptual opening: dissonance may not be a pathology but a structural feature of human cognition.

Yet one striking omission runs through this history. Whether cast as drive, self-threat, or self-affirmation, dissonance has almost always been studied in adults, and only recently extended into childhood. The earliest

moments of life—before choice, language, or self-concept—remain almost entirely absent from this tradition. It is precisely here, I argue, that the structural character of dissonance becomes most visible.

2.2 Extension: Dissonance as Epistemic Event

The conventional framing of cognitive dissonance treats it as an anomaly—a maladaptive bias to be reduced. In contrast, I argue that dissonance is not a deviation from cognition but its structural condition. Dissonance is the affective signal of contradiction inherent to knowing: the embodied registration that perception, expectation, and world cannot always be aligned.

This reframing extends the claim I developed in *Cognitive Dissonance as Epistemic Event* (Kahl, 2025a). There, I proposed that dissonance is the grammar of epistemic life. Just as syntax orders language, dissonance orders cognition by marking its limits. It punctuates experience when expectation is resisted—when a trusted friend betrays confidence, when the hand reaching for a familiar object encounters unexpected absence, or, at the beginning of life, when a newborn encounters hunger or cold. In each case, dissonance signals that what is known is insufficient, that adjustment is required.

The conceptual move is to shift dissonance out of psychology’s deficit frame and into epistemology’s constitutive frame. No longer seen merely as a behavioural anomaly, dissonance is reconceived as an epistemic event: a moment when the scaffolding of knowledge reveals its seams. This reorientation permits a deeper analysis of how autonomy and dependence emerge, not as aberrations but as conditions co-structured by the experience of contradiction.

The philosophical stakes are significant. To call dissonance an epistemic event is to place it in dialogue with finitude, contradiction, and relational dependence. Like finitude, dissonance reminds us that knowing is bounded. Like contradiction, it exposes tension at the heart of thought. Unlike either, however, dissonance is affective, embodied, and relational—it is felt in the body and calls forth recognition from others. This relational dimension prepares the way for understanding infancy as the crucible of epistemic life, where dissonance is observable even before choice or language.

This claim gains empirical support from developmental research. Studies of children, infants, and toddlers have shown that dissonance reduction occurs well before reflective self-concept (Egan, Santos, & Bloom, 2007; Silver et al., 2020; Grosse Wiesmann et al., 2022). These findings, reviewed in the next section, demonstrate that dissonance is structural from the earliest stages of life.

2.3 Ontogenetic Evidence

2.3.1 Early comparative/developmental findings

A key step in broadening dissonance theory beyond adults came from Egan, Santos, and Bloom (2007). In their influential study, young children and capuchin monkeys were presented with two equally attractive items. After being induced to reject one, they subsequently avoided that unchosen option in favour of a novel third. This mirrored the classic “free-choice” paradigm in adults: once a commitment was made, the rejected alternative was devalued to reduce tension.

The significance of these results is twofold. Ontogenetically, they show that dissonance reduction is present in early childhood, before mature self-reflection or advanced metacognition. Phylogenetically, the fact that capuchins displayed the same behaviour indicates that the mechanism is not uniquely human but part of a broader primate repertoire. In both respects, dissonance emerges as a fundamental feature of decision-making, not a culturally induced or adult-specific pathology.

Critics have questioned whether these findings reflect genuine preference change or artefacts of choice structure. Yet even with such caveats, the study has reshaped the field, pushing dissonance theory beyond its traditional confines. From my perspective, it reinforces the claim that dissonance is structural: an epistemic event signalling contradiction, observable across development and species.

If dissonance is already present in children and non-human primates, the natural next question is how early in human development it appears. The most recent research suggests that it can be observed even before language and reflective choice, in the first years of life.

2.3.2 Infancy studies

Building on the comparative findings of Egan, Santos, and Bloom (2007), more recent work has pushed dissonance research into the earliest stages of human development. Silver, Stahl, Loiotile, Smith-Flores, and Feigenson (2020) demonstrated that preverbal infants between 10 and 20 months display choice-induced preference shifts. When presented with two equally attractive toys, infants who selected one later avoided the unchosen alternative, favouring instead a novel third. This suggests that even before language acquisition or explicit self-concept, infants act to align subsequent preferences with past choices. Dissonance reduction, in other words, is already operating preverbally as a mechanism to manage contradiction. Some have debated whether such effects reflect genuine rationalisation or simpler attentional biases, but the fact remains that infants exhibit behaviour consistent with dissonance reduction well before reflective cognition.

Grosse Wiesmann, Kampis, Poulsen, Schöler, Lukowski Duplessy, and Southgate (2022) extended this evidence into toddlerhood. Their “blind-choice” paradigm revealed that two-year-olds devalued unchosen items even when their initial selections were made without knowledge of the options. Here, the mere act of commitment was sufficient to trigger dissonance reduction. This marks a developmental step beyond the simple updating seen in infants: toddlers demonstrate an internalised mechanism whereby dissonance arises from the act of choice itself, independent of direct comparison.

Taken together, these studies show a developmental layering. Silver et al. (2020) highlight that dissonance reduction emerges before language or reflective self-concept, while Grosse Wiesmann et al. (2022) demonstrate that toddlers begin to internalise dissonance as an abstract effect of commitment. Both findings underscore that dissonance is structural, appearing earlier than previously recognised. If infants already display dissonance-like processes in choice tasks, it is plausible that its roots extend back further still—to the embodied, pre-choice expressions of contradiction such as crying.

2.3.3 Developmental trajectory

Taken together, the comparative and infancy studies suggest a developmental progression in how dissonance is expressed. In preverbal infants, the mechanism appears first as simple choice-induced avoidance: once a toy is selected, the unchosen option is subsequently devalued (Silver et al., 2020). By toddlerhood, however, the process becomes more abstract. In the blind-choice paradigm, two-year-olds devalue unchosen items even when their initial selections were made without knowledge of the options (Grosse Wiesmann et al., 2022). Here,

the mere act of commitment is sufficient to trigger dissonance reduction. This step from visible preference updating to blind-choice rationalisation indicates a deeper internalisation of the dissonance mechanism. Toddlers are not just aligning preferences to outcomes but showing that the fact of choosing itself carries epistemic weight.

Placed alongside the evidence from children and capuchins (Egan, Santos, & Bloom, 2007), the trajectory points to both ontogenetic and phylogenetic depth. Dissonance reduction is observable not only across early stages of human development but also across species, underscoring that it is not a culturally contingent artefact but a structural feature of cognition.

Of course, debates remain about whether these effects reflect genuine rationalisation or alternative processes, such as attentional biases or task artefacts. Yet the consistency of results across age groups and species strongly suggests that dissonance is more than a laboratory trick. It is a basic, embodied mechanism for managing contradiction long before language or reflective selfhood.

If dissonance emerges this early—before words, before self-concept, and even in non-human primates—it is reasonable to trace its roots further still. Rather than beginning with choice, we may locate its earliest form in embodied affective signals that register contradiction without representation. The newborn's cry is the paradigmatic instance of such a signal: the first epistemic event in human life.

2.4 Implication: Dissonance as Structural

The comparative and developmental evidence converges on an important conclusion: dissonance reduction precedes language, self-reflection, and abstract reasoning. Infants as young as ten months adjust preferences to align with past choices (Silver et al., 2020). Toddlers devalue unchosen items even in blind-choice paradigms, where the act of commitment alone triggers rationalisation (Grosse Wiesmann et al., 2022). Children and capuchin monkeys display avoidance of previously rejected options (Egan, Santos, & Bloom, 2007). Across age groups and even across species, the pattern repeats. Dissonance is not confined to reflective adults but is active at early developmental stages and observable beyond the human case.

Of course, these findings are not without debate. Some critics suggest that infant choice paradigms may capture attentional biases or perceptual novelty effects rather than genuine rationalisation. Yet the convergence of evidence across methodologies, developmental stages, and species suggests a robust underlying mechanism. Even if the exact form varies, the persistent pattern points to dissonance as a basic cognitive–affective process.

This reframes the phenomenon. Rather than treating dissonance as an anomaly or maladaptive bias, it must be recognised as structural—an organising feature of human cognition. To call it structural is to claim that dissonance is not an occasional disruption of coherence but the constitutive signal that reveals contradiction. It is the affective hinge of knowing, shaping how expectation, perception, and belief are continuously adjusted.

This recognition also clarifies the limits of Festinger's original framing. Festinger was correct in emphasising the ubiquity of dissonance, but his reductionist drive model—patterned on mid-century behaviourism—cast it as an aversive tension to be eliminated. Such an account misses the structural depth revealed by ontogenetic and phylogenetic evidence. Dissonance is not merely an error signal in an otherwise rational system; it is the grammar of epistemic life itself, the embodied way in which contradiction is registered and negotiated.

If this is correct, then the next step is to seek its earliest embodied form. If dissonance operates before language and reflective selfhood, it must also operate before choice itself. Its most primordial expression is not in toy

selection or preference rationalisation but in the newborn's cry—the first signal of contradiction voiced into the world.

2.5 New Insight: The Cry as the Earliest Dissonance Signal

The developmental findings discussed above trace dissonance into the first years of life, but they still take choice as their starting point. Silver et al. (2020) show that infants reduce dissonance after selecting between toys, and Grosse Wiesmann et al. (2022) demonstrate that toddlers rationalise even blind choices. Both cases assume a decision point—however rudimentary—as the trigger. Yet dissonance may reach further back, to a stage prior to choice altogether.

I propose that the newborn's cry is the earliest form of dissonance. Rooted in respiratory reflexes, neural arousal, and autonomic activation, the cry is undeniably physiological. But its significance exceeds biology. It is epistemic because it registers a mismatch between embodied expectation and environment: the pang of hunger unmet, the shock of cold air, the intrusion of bright light. In voicing this contradiction, the cry is not mere reflex but the first epistemic dissonance event.

This perspective reframes the developmental trajectory. While Silver and Grosse Wiesmann locate dissonance in choice tasks, crying reveals its deeper, pre-choice character. Dissonance is not exclusively choice-induced; it is condition-induced. It appears as embodied contradiction from the threshold of life itself. Evolutionary accounts confirm that crying functions as a graded signal designed to elicit a caregiver's attention (Soltis, 2004), while cross-cultural observations show how caregivers transform cries into interactional exchanges, sometimes even playful reframings (Takada, 2021). These findings underscore that the cry is already relational: it not only signals dissonance but invites response.

The theoretical consequence is clear. If dissonance is present at the very beginning of life, it must be understood not as a by-product of later cognition but as a structural affect of contradiction. The cry inaugurates epistemic life by externalising dissonance in a communicative form. How that signal is received—through comfort, neglect, or reframing—shapes the pathways of resilience or dependence. Chapter 3 develops this further by examining infancy as the crucible of epistemic life, where the first responses to the cry scaffold the conditions of knowing.

3. Infancy as the Crucible of Epistemic Life

3.1 Evolutionary Perspective: Crying as Signal

Crying is a near-universal feature of human infancy. While every newborn is equipped with the capacity to cry, the frequency, intensity, and interpretation of those cries are culturally shaped. What is invariant, however, is the biological design: crying is one of the earliest evolved adaptations for survival.

Soltis (2004) offers the most comprehensive account of this function. He shows that infant crying operates as a graded signal of need, designed to elicit caregiver response. Its adaptiveness is straightforward: infants who can reliably summon care are more likely to survive. Yet the signal is costly. Sustained crying expends energy, disrupts sleep, and, in ancestral environments, could attract predators. Why, then, has it persisted? The

paradox is resolved by the principle of honesty. Precisely because crying is costly, it is difficult to fake. The cry remains a credible indicator of genuine need, stabilising it as a reliable communication system across evolutionary time.

While Soltis frames this in survival terms, his analysis already hints at something epistemic. A cry is not just noise but a claim. Its costliness forces acknowledgement, pressing a caregiver to recognise that “something is wrong.” In this sense, the cry exemplifies what I call an epistemic event: the embodied registration of contradiction between expectation and environment. The newborn does not yet choose between alternatives, but the cry externalises a misalignment—cold air, hunger, light, absence—in a form that demands response.

From this perspective, crying is both an evolutionary tool and the first act of epistemic life. It registers contradiction and communicates it in a way that cannot be ignored without consequence. The bridge from biology to meaning lies precisely here: the cry is not only an adaptation for survival but an inaugural epistemic signal. How that signal is answered—whether with comfort, neglect, or reframing—will determine whether the infant learns that dissonance can be endured with support, or that it must be suppressed to secure care. This opens directly onto the next step: the cultural shaping of caregiving responses.

3.2 Cross-Cultural Caregiving: Reframing Crying into Play

If crying is universal in its biological basis, the ways in which caregivers respond to it are diverse. Far from uniform, caregiving practices actively shape how an infant learns to experience and interpret dissonance.

Takada (2021) documents a striking example among the !Xun San of Namibia. Caregivers there often respond to infant distress not by immediate soothing or suppression but by transforming the cry into playful interaction. A whimper may be met with laughter, mimicry, or rhythmic gestures, reframing the infant’s affective signal as part of a shared social game. Rather than silencing the contradiction, the caregiver integrates it into a reciprocal exchange, teaching the infant that dissonance can be managed in relation, not only resolved or erased.

This is not an isolated case. Anthropological research has long shown that small-scale societies often adopt highly responsive and socially embedded strategies for infant care, such as near-constant carrying, co-sleeping, and communal soothing. These practices highlight that crying is not interpreted in a single way but situated within cultural norms that balance physiological need, socialisation, and collective caregiving.

The implication is that caregiving responses are not binary. They may comfort, reframe, postpone, or sometimes suppress the infant’s signal, depending on circumstance. Each mode carries epistemic weight, conveying lessons about how contradiction is to be handled: whether it can be acknowledged and woven into social interaction, or whether it must be minimised or silenced.

From the perspective of epistemic psychology, such variation reveals how the earliest fiduciary scaffolds are culturally constructed. A caregiver who reframes crying into play offers not just distraction but recognition, converting dissonance into an opportunity for connection. A caregiver who ignores or suppresses the cry, by contrast, risks rehearsing a lesson of epistemic dependence: contradiction must be withheld to secure care.

Crying, then, is not only a biological adaptation but also a cultural site where epistemic norms are inscribed. How it is met—whether dignified, transformed, or muted—sets the conditions for the infant’s earliest experiences of resilience, recognition, and dependence.

3.3 Caregiver as Epistemic Trustee: Fiduciary Response vs Neglect/Silencing

If crying is the infant's first epistemic signal, then the caregiver is its first epistemic trustee. The infant voices contradiction but cannot yet resolve it alone. The caregiver's role is therefore one of stewardship—acting in the infant's best interests, recognising and responding to dissonance in ways that preserve trust and scaffold resilience.

When caregivers respond with comfort, soothing, or simple recognition, they provide more than momentary relief. Such responses model that contradiction can be endured, tolerated, and integrated. In doing so, they lay the foundation for resilience and a healthy tolerance of dissonance as an ordinary feature of life.

By contrast, neglect, silencing, or punitive responses alter the epistemic message. In these contexts, the infant learns that contradiction must be suppressed to secure care, or that voicing dissonance is unsafe. The cry ceases to be a trustworthy epistemic claim and becomes a risk to be managed. This rehearses the logic of dependence: survival is tied to the concealment of contradiction, an early form of epistemic clientelism.

Empirical research substantiates this distinction, though with nuance. Leerkes, Blankson, and O'Brien (2009) showed that maternal sensitivity to distress (not merely non-distress cues) was a strong predictor of later socio-emotional outcomes, highlighting the unique importance of how contradiction is met. Groh et al. (2019) found that maternal physiological and affective responses to infant crying shaped later attachment styles: avoidant patterns emerged when distress was met with withdrawal, while resistant patterns developed under heightened but inconsistent responding. Hepworth et al. (2021) demonstrated that targeted interventions—training caregivers to recognise and respond more sensitively to distress—significantly improved attachment outcomes, suggesting that fiduciary scaffolds can be strengthened deliberately. Northrup et al. (2024) extended this to high-risk infants, showing that the quality of co-regulation of negative emotion at 18 months influenced divergent developmental trajectories, underscoring that the process is reciprocal and dynamic.

Importantly, caregiving responses fall along a spectrum. They range from neglect to sensitive attunement, with many gradations in between. And as Takada's (2021) work reminds us, sensitivity itself is culturally shaped: some caregivers respond with playful reframing, others with soothing, and still others with delayed or communal responses. Each of these patterns carries epistemic implications, teaching the infant different lessons about how contradiction is to be expressed, recognised, or muted.

Seen in this light, caregiving responses to crying are not mere affective habits but epistemic acts. They are the first exercises of fiduciary stewardship in human life: decisions about whether contradiction will be dignified, negotiated, or silenced. The recognition of the infant's cry is thus the inaugural fiduciary act of epistemic life.

3.4 Parent–Offspring Conflict: Crying, Honest Signalling, and Negotiation

The cry is never neutral. It unfolds within the evolutionary dynamic of parent–offspring conflict. Trivers (1974) argued that infants are selected to demand more care than parents are selected to provide, because the marginal benefit of one more unit of parental investment is greater for the offspring than for the parent, who must balance the needs of multiple children and their own survival. Crying, in this framework, becomes the infant's primary means of pressing its claim in this evolutionary negotiation.

Soltis (2004) analyses crying as a system of honest signalling. Because crying is energetically costly, difficult to sustain, and potentially dangerous in ancestral environments, it is not easily faked. The signal is therefore reliable: its costliness ensures that cries generally reflect genuine need. Moreover, crying is graded: a whimper

signals mild discomfort, while an intense, prolonged wail signals urgent distress. From an epistemic perspective, this gradation is significant: it resembles a scale of claim strength, where the intensity of the cry indicates the magnitude of contradiction between embodied state and environment.

The epistemic angle becomes clearer when honesty is reframed as reliability of an epistemic claim. The cry functions as a primitive truth-claim: “something is wrong.” Unlike linguistic assertions, its veracity is secured by costliness, not by propositional content. In this sense, the cry is an epistemic event that not only reports but enacts contradiction, broadcasting it into the social world.

Yet the exchange is asymmetrical. Parents interpret the infant’s claim through the lens of their own resources, emotional state, and cultural scripts. A caregiver under stress may discount even an urgent cry, while another—embedded in a cultural ethos of constant responsiveness—may answer immediately. In societies where “cry it out” practices are normative, the same signal is recast as manipulation or training opportunity rather than as need. Thus, the epistemic claim of the cry is filtered through adult interpretation, which may dignify, delay, or suppress it.

This evolutionary and cultural asymmetry reveals that the cry is not just a biological demand but the first site of epistemic negotiation. The infant asserts need in the only way available; the parent adjudicates its legitimacy and urgency. In this process, the earliest contours of autonomy and dependence are drawn. The cry is therefore both a survival mechanism and the prototype of epistemic exchange: a negotiation over contradiction, recognition, and trust.

3.5 Implication: The First Fiduciary Scaffold Emerges in the Cradle

As shown in §§2.5 and 3.1, the cry is simultaneously biological and epistemic: a signal evolved for survival that also registers contradiction and invites recognition. What matters for development is not the cry alone but how it is met. The caregiver’s response constitutes the infant’s first fiduciary scaffold—the initial structure through which epistemic life takes shape.

When caregivers respond with sensitivity, comfort, or even playful reframing, they dignify dissonance. Such responses, observed in studies of maternal sensitivity (Leerkes, Blankson, & O’Brien, 2009) and co-regulation (Northrup et al., 2024), model that contradiction can be endured, tolerated, and shared. They foster secure attachment and a resilient capacity for dissonance. By contrast, withdrawal, inconsistency, or neglect rehearses a different lesson: that contradiction must be hidden or suppressed to secure care. Research on avoidant and resistant attachment (Groh et al., 2019) and sensitivity-based interventions (Hepworth et al., 2021) confirms that silencing or inconsistent responses can entrench dependence and mistrust.

These early scaffolds are formative but not absolute. Later experiences, cultural practices, and therapeutic interventions can reinforce, reshape, or even repair them. Still, the cradle remains the site of the first epistemic template, where patterns of recognition or suppression are rehearsed with enduring impact.

The long-term stakes are clear. The lessons carried in the first fiduciary scaffold shape how individuals approach resilience, autonomy, and epistemic trust throughout life. Chapter 4 develops this continuity, showing how early fiduciary and clientelist pathways crystallise in attachment patterns and extend into adolescence and adult intimate relationships, where the grammar of dependence and recognition is replayed in more complex forms.

4. Fiduciary vs Clientelist Pathways

4.1 Maternal Sensitivity to Distress vs Non-Distress

Not all forms of maternal sensitivity carry equal weight for development. In a longitudinal study of 101 mother–infant dyads, Leerkes, Blankson, and O’Brien (2009) distinguished between maternal responses to infant distress (crying, whimpering, visible upset) and to non-distress signals (neutral or positive engagement). They found that sensitivity to distress was a unique predictor of socio-emotional outcomes at age two, including greater emotional regulation and social competence. While responsiveness to non-distress cues was beneficial, it did not show the same predictive strength once distress sensitivity was taken into account.

The epistemic implication is clear. Distress marks the point where the infant encounters contradiction between need and environment. A whimper or cry is not simply another interactional cue but a first-order epistemic claim: an embodied assertion that something is wrong. Caregiver recognition at this point is more than soothing; it affirms the reliability of the infant’s signal and teaches that contradiction can be both expressed and addressed. By contrast, ignoring or downplaying the cry denies the claim at its sharpest edge, leaving contradiction unacknowledged.

This explains why sensitivity to distress, more than to neutral or positive states, functions as the earliest fiduciary act. Meeting the infant at the point of dissonance constitutes the first scaffold of epistemic trust. It models that contradiction is survivable and communicable, laying the foundation for resilience.

The finding also highlights that fiduciary scaffolds are not fixed endowments but relational achievements. If sensitivity to distress predicts better outcomes, it follows that enhancing sensitivity could alter developmental trajectories. This sets the stage for the next section, which examines evidence that maternal sensitivity to distress can be deliberately strengthened through intervention.

4.2 Intervention Evidence: Increasing Maternal Sensitivity

If Leerkes et al. (2009) showed that natural variation in maternal sensitivity to distress predicts later outcomes, the next question is whether this sensitivity can be deliberately enhanced. Hepworth, Berlin, Salas, Pardue-Kim, Martocchio, and Jones Harden (2021) addressed this directly in a randomised controlled trial of an attachment-based programme. The intervention consisted of structured sessions, including guided discussions and video feedback, aimed at helping mothers recognise, interpret, and respond more sensitively to their infants’ distress. Mothers in the intervention group met weekly over several months, allowing skills to be practised and reinforced.

The results indicated moderate but significant improvements. Mothers who received the intervention were more attuned to infant distress, and their infants showed measurable gains in attachment security compared to controls. Not every dyad benefited equally, but the overall effect was consistent: deliberate support increased sensitivity at the very points of contradiction.

From an epistemic perspective, the mechanism is instructive. The programme trained caregivers to pause, observe, and dignify the infant’s cry rather than to dismiss or misinterpret it. In effect, the intervention operationalised fiduciary care: recognising the infant’s embodied claim that “something is wrong” and responding in ways that affirmed its legitimacy.

The lesson is that fiduciary scaffolds are not fixed traits but relational capacities that can be cultivated. Dissonance tolerance is plastic, contingent on whether caregivers are equipped to hear and meet epistemic claims at their most acute. This moves the argument from natural variation to deliberate support. If sensitivity can be strengthened through intervention, then the conditions of epistemic life are not solely dependent on individual caregiving style but open to intentional cultivation. The next section deepens this argument by examining how maternal physiological and affective responses predict different attachment trajectories.

4.3 Maternal Physiological/Affective Responding and Attachment Patterns

Behavioural sensitivity is only part of the story. How caregivers regulate their own physiology and emotions when confronted with infant distress also plays a decisive role in shaping attachment. Groh, Propper, Mills-Koonce, Moore, Calkins, and Cox (2019) investigated this in a longitudinal study of more than 200 mother–infant dyads. Maternal physiological responses—measured via indicators such as vagal tone and skin conductance—were assessed during episodes of infant crying, alongside observational measures of affective behaviour. These regulatory patterns were then linked to later attachment outcomes in early childhood.

Two trajectories were especially salient. Mothers who coped with distress by dampening their own arousal and withdrawing emotionally were more likely to have children who developed avoidant attachment. In epistemic terms, withdrawal blunts the infant’s contradiction: the cry is acknowledged neither physiologically nor affectively, teaching that dissonance is unsafe to voice. By contrast, mothers who exhibited high physiological arousal combined with inconsistent soothing were more often associated with resistant (ambivalent) attachment. Here, the scaffold is unstable: contradiction is sometimes recognised, but unpredictably, leaving the infant uncertain whether their epistemic claim will be dignified or disregarded.

Secure attachment arose when caregivers maintained enough physiological regulation to respond consistently and calmly to infant distress. In epistemic terms, this models that contradiction can be voiced and met without collapse. Secure scaffolds therefore dignify dissonance, containing it in a way that fosters resilience and trust.

These findings highlight that attachment outcomes are not reducible to behaviour alone but are shaped by caregivers’ internal regulation. The epistemic lesson follows: the infant not only perceives how caregivers act, but also—in the consistency and tone of response—learns how contradiction will be tolerated or suppressed in the relational field.

This underscores that fiduciary scaffolds are fragile and context-dependent. They depend not only on the willingness but also the capacity of caregivers to regulate themselves in the face of infant dissonance. The stakes of this fragility become clearer in the next section, which examines how co-regulation of negative emotion unfolds in infants at elevated developmental risk.

4.4 Co-Regulation of Negative Emotion in At-Risk Infants

The importance of fiduciary scaffolding extends beyond typical development. Northrup, Cortez, Mazefsky, and Iverson (2024) studied 18-month-old infants at increased likelihood for autism, tracking caregiver–infant co-regulation of negative emotion across diverse developmental outcomes. Using detailed behavioural coding of distress episodes and observational measures of caregiver responses, the study examined how dyads managed crying, frustration, and other expressions of contradiction.

The results showed clear patterns. Dyads characterised by consistent and effective co-regulation—where caregivers acknowledged distress, provided scaffolding, and helped infants regain regulation—were more likely to see positive trajectories in socio-emotional functioning, including greater expressive range and improved social engagement. By contrast, inconsistent or absent co-regulation predicted greater persistence of distress and elevated risk for later difficulties in emotion regulation. Importantly, outcomes were not uniform: some infants showed resilience despite weaker scaffolds, while others remained vulnerable despite adequate support, underscoring the probabilistic rather than deterministic nature of these pathways.

From an epistemic perspective, the findings highlight that even in atypical or high-risk contexts, the recognition of contradiction remains decisive. The infant's cry and distress behaviours are not diminished in epistemic weight but amplified: when scaffolding succeeds, they become the grounds of trust; when it fails, they reverberate as unmediated contradiction. This underscores that fiduciary care is not optional—it is the hinge on which developmental trajectories turn, regardless of diagnostic likelihood.

These results reinforce the claim that the fiduciary dynamic is general, not confined to typical populations. Early exchanges of distress and response are the crucible where epistemic lessons—about whether contradiction is survivable, communicable, or suppressible—are first learned. In the next section, we trace how these early fiduciary and clientelist pathways echo into later childhood and adolescence, influencing attachment security and the development of autonomy in family decision-making.

4.5 Later Outcomes: Insecure Attachment and Adolescent Autonomy

The implications of early fiduciary scaffolding extend into adolescence. Van Petegem, Beyers, Brenning, and Vansteenkiste (2013) studied more than 1,200 Belgian adolescents, examining how attachment styles related to autonomy in family decision-making. Using survey measures of attachment security and autonomy across a range of household decisions, they found that insecure attachment was consistently associated with diminished autonomy. Adolescents with avoidant attachment tended to disengage from decisions, preferring withdrawal to negotiation. Those with resistant (ambivalent) attachment often approached decision-making with heightened conflict or vacillation. In both cases, autonomy was constrained: the adolescent lacked the confidence or stability to act as an equal epistemic partner in the family context.

From an epistemic standpoint, these findings suggest that the lessons of infancy carry forward as decision repertoires. Infants whose early cries were met with recognition and consistent care learn that contradiction is survivable and communicable, a lesson that later supports participatory autonomy. By contrast, infants whose epistemic claims were silenced or inconsistently met may carry forward repertoires of withdrawal, ambivalence, or over-dependence, narrowing their ability to assert themselves under conditions of disagreement.

Yet these pathways are not deterministic. Peer relationships, schooling, and broader cultural norms also shape autonomy in adolescence, and some individuals with insecure attachments nonetheless develop robust decision-making capacities. What Van Petegem et al. (2013) demonstrate is not inevitability but correlation: insecure attachment constrains the range of epistemic strategies available, making autonomous participation less likely.

This continuity from cradle to adolescence reinforces the broader claim that fiduciary versus clientelist responses are not fleeting dynamics but enduring patterns. Chapter 4 closes by synthesising this evidence, showing that recognition fosters resilience and secure autonomy, while silencing rehearses clientelist dependence—a contrast that prepares the ground for formal modelling in Chapter 5.

4.6 Interpretation: Recognition vs Silencing

Across the evidence in this chapter, a common pattern emerges. Sensitivity to infant distress predicts socio-emotional competence (Leerkes et al., 2009). Intervention can enhance that sensitivity and improve attachment security (Hepworth et al., 2021). Caregivers' own physiological and affective regulation shape whether attachment develops as secure, avoidant, or resistant (Groh et al., 2019). Even in high-risk contexts, the quality of co-regulation remains decisive (Northrup et al., 2024). And by adolescence, insecure attachments are linked to diminished autonomy in family decision-making (Van Petegem et al., 2013). Each study highlights the same dynamic from a different angle: the way distress is recognised or silenced sets the trajectory of attachment and autonomy.

The contrast is stark but not simplistic. Recognition—consistent comfort, attunement, or playful reframing—creates fiduciary scaffolds that dignify contradiction, modelling that dissonance can be endured and communicated. Silencing—through withdrawal, neglect, or inconsistency—rehearses clientelist repertoires in which autonomy is traded for security, and contradiction is muted. Yet these are not rigid destinies. Development remains plastic, open to reshaping by peers, schools, cultural norms, and deliberate interventions. What is inscribed in the cradle can be reinforced, revised, or resisted.

The epistemic stakes are decisive. Early caregiving is not merely emotional regulation but epistemic education. It teaches whether contradiction is survivable, shareable, and worthy of recognition—or whether it must be hidden to preserve connection. In this sense, recognition is the first act of epistemic trust, while silencing is the first rehearsal of epistemic dependence.

Chapter 5 formalises this insight. Using the *Kahl Model of Epistemic Dissonance* (KMED-I), we will model how different caregiver response policies—recognition, suppression, inconsistency—generate divergent developmental pathways. The aim is to show computationally how the first cry initiates branching trajectories toward resilience or dependence, making visible the architecture of epistemic life from its beginning.

5. KMED-I: Computational Model of the First Cry

KMED-I (Infancy) is a stylised, conceptual model of the cry–response dyad. It extends the *Kahl Model of Epistemic Dissonance* (KMED) into the earliest developmental context, not to predict empirical outcomes with precision but to illustrate the formal consequences of alternative caregiving policies. Like Schelling's segregation models or early artificial neural networks, KMED-I should be read as a proof-of-concept framework: it clarifies conceptual dynamics and renders epistemic trajectories visible, without purporting to mirror empirical datasets directly.

5.1 Extending the Kahl Model of Epistemic Dissonance to Infant–Caregiver Dynamics

The *Kahl Model of Epistemic Dissonance* (KMED) conceptualises dissonance as an epistemic event: the affective registration of contradiction between embodied expectation and environmental reality (Kahl, 2025a). Unlike classical cognitive dissonance theory, which frames dissonance as an anomaly or maladaptive bias to be corrected (Festinger, 1957; Aronson, 1968; Steele, 1988), KMED treats dissonance as structural—the very signal that makes learning, adaptation, and knowledge-formation possible.

KMED-I (Infancy) extends this framework into the first months of life, presenting a stylised, proof-of-concept model of the infant–caregiver dyad. Its aim is not to reproduce empirical datasets, but to formalise and illustrate how the newborn’s cry can be understood as the primordial epistemic event. At birth, the infant has no symbolic language, no self-concept, and no rational deliberation, yet contradiction is immediately registered and expressed. Cold, hunger, or sudden discomfort produce a mismatch between embodied need and environment. The cry externalises this contradiction into the world, summoning a response.

Formally, KMED-I represents this process as a state–update system in which each cry–response cycle modifies the infant’s epistemic trajectory. The model allows us to explore, in highly simplified terms, how distinct caregiving policies—fiduciary, inconsistent, neglectful, or silencing—script divergent developmental pathways of autonomy, tolerance, and dependence.

At birth, the infant has no symbolic language, no self-concept, and no rational deliberation, yet contradiction is immediately registered and expressed. Cold, hunger, or sudden discomfort produce a mismatch between need and environment. Formally:

$$\delta_t = f(\text{need}_t - \text{environment}_t),$$

where δ_t represents dissonance intensity at time t , emerging as an embodied perception of contradiction. When δ_t exceeds a threshold θ , the infant produces a cry, which externalises contradiction into the social world.

Dyadic mediation of dissonance

The crucial innovation of KMED-I is the recognition that infant dissonance is not self-regulated but co-regulated. Unlike later developmental stages where contradiction can be reframed internally, in infancy survival depends on whether the cry elicits a response. The cry thus initiates a dyadic process:

- **Recognition (R)** – the caregiver interprets the cry as legitimate, providing comfort or remediation.
- **Suppression (S)** – the caregiver dismisses, ignores, or actively silences the cry.
- **Inaction (\emptyset)** – the caregiver neither recognises nor suppresses, leaving dissonance unresolved.

These responses constitute caregiver policies, probabilistic rules governing how cries are met. Across repeated cry–response cycles, such policies sculpt the infant’s epistemic repertoire: whether contradiction is dignified and scaffolded into resilience, or extinguished and transposed into dependence.

From narrative to computation

The novelty of KMED-I lies in its computational formalisation. Each cry–response episode is represented as a state-update system, where dissonance (δ), autonomy (EA), tolerance (DT), and dependence (D) evolve over time. This allows us to simulate developmental trajectories under different caregiver policies, rather than leaving them implicit in observational accounts.

The computational design draws on—but also departs from—existing traditions:

- **Behaviourist/drive-reduction models** (Hull, 1943) regarded crying as reflexive discharge, extinguished once needs are met.
- **Cognitive dissonance models** (Festinger, 1957; Cooper, 2007) cast contradiction as aversive error.

- **Active inference models** (Friston et al.) formalise surprise minimisation but rarely incorporate dyadic fiduciary scaffolds.
- **Attachment simulations** model consistency of care but neglect the epistemic status of dissonance.

KMED-I synthesises these strands while adding a distinctive contribution: dissonance is not noise to be eliminated but an epistemic signal whose recognition or silencing produces durable structural consequences.

Thus, the newborn’s cry becomes not only a biological reflex but the first epistemic claim—a demand for fiduciary recognition. The caregiver’s response determines whether contradiction becomes survivable (fostering epistemic autonomy and tolerance) or collapses into clientelist dependence. Over repeated cycles, this dyadic exchange writes the grammar of epistemic life, with trajectories visible both in attachment categories (secure, avoidant, ambivalent, disorganised) and in the computational simulations presented later in this chapter.

KMED-I should be read as a stylised, conceptual framework. Its role is to render visible the formal consequences of different caregiving policies, not to prescribe parenting practice or clinical intervention. The model clarifies conditions for epistemic dignity; empirical validation and applied protocols remain tasks for future work.

5.2 State Variables: Modelling the Dyad

KMED-I represents the infant–caregiver system as a stylised, iterated cry–response process in which each episode updates the infant’s epistemic capacities. The model is not calibrated against empirical measurements; rather, it is designed to formalise and illustrate how different caregiving responses condition developmental trajectories.

Five principal state variables evolve over cycles, shaped by caregiver policies of recognition (R), suppression (S), or inaction (\emptyset). Each variable is normalised to the unit interval [0,1] (enforced by a clipping operator), and stochasticity is introduced via small Gaussian noise terms to reflect variability in interaction.

The modelling sequence is structured across three levels:

- Conceptual definitions of policies (Table 5.1).
- Operationalisation as numerical parameter presets for simulation (Table A.5.1).
- Observed trajectories produced under each policy (Table 5.2).

Together, these tables allow the model to be read as a proof-of-concept system: inputs, implementation, and outputs linked in one chain, demonstrating the formal consequences of recognition versus suppression in the earliest fiduciary exchange.

5.2.1 Dissonance intensity (δ)

- **Definition:** The embodied mismatch between the infant’s physiological/affective state and the environment.
- **Interpretation:** δ captures hunger, cold, discomfort, pain—i.e., ‘felt contradiction’.

- **Range:** Continuous, $0 \leq \delta_t \leq 1$.

- **Dynamics:**

$$\delta_{t+1} = \text{clip}(\delta_t + \eta - \lambda R_t + \epsilon_\delta),$$

where $\eta > 0$ is baseline accumulation of unmet need, $\lambda > 0$ is relief efficacy of recognition, $R_t \in \{0,1\}$, and $\epsilon_\delta \sim \mathcal{N}(0, \sigma_\delta^2)$.

- **Cry threshold:** A cry becomes available when $\delta_t \geq \theta$ (with $\theta \in [0.3, 0.6]$ by default).

5.2.2 Recognition (R)

- **Definition:** Caregiver action that interprets and responds to the cry as a legitimate epistemic claim.
- **Interpretation:** Fiduciary recognition dignifies contradiction, transforming dissonance into resilience.
- **Range:** Binary, $R_t \in \{0,1\}$, sampled from a Bernoulli with policy-dependent probability p_R^Π only if $\delta_t \geq \theta$.
- **Effect:** Higher R reduces δ (by λ), reinforces EA and DT, and reduces D.

5.2.3 Suppression (S)

- **Definition:** Caregiver action that ignores, dismisses, or actively silences the cry.
- **Interpretation:** Suppression can stop the observable cry but erodes epistemic scaffolds.
- **Range:** Binary, $S_t \in \{0,1\}$, sampled from a Bernoulli with probability p_S^Π conditional on $R_t = 0$ (mutual exclusivity). If $\delta_t < \theta$, set $R_t = S_t = 0$.
- **Effect:** Higher S does not directly relieve δ in the model (only recognition does); it reduces EA, erodes DT, and increases D.

5.2.4 Epistemic Autonomy (EA)

- **Definition:** Capacity to persist in signalling contradiction without collapse.
- **Interpretation:** Willingness to ‘cry again’—confidence in the value of signalling.
- **Range:** Continuous, $0 \leq EA_t \leq 1$.
- **Dynamics:**

$$EA_{t+1} = \text{clip}(EA_t + \alpha R_t - \beta S_t + \epsilon_{EA}),$$

with $\alpha, \beta > 0$ and $\epsilon_{EA} \sim \mathcal{N}(0, \sigma_{EA}^2)$.

- **Trajectory:** Consistent R \Rightarrow EA rises; persistent S \Rightarrow EA collapses.

5.2.5 Dissonance Tolerance (DT)

- **Definition:** Capacity to withstand contradiction without disintegration or withdrawal.
- **Interpretation:** Inward resilience—bearing discomfort while remaining communicative.
- **Range:** Continuous, $0 \leq DT_t \leq 1$.
- **Dynamics:**

$$DT_{t+1} = \text{clip}(DT_t + \gamma R_t - \kappa S_t + \epsilon_{DT}),$$

$$\text{with } \gamma, \kappa > 0 \text{ and } \epsilon_{DT} \sim \mathcal{N}(0, \sigma_{DT}^2).$$

- **Trajectory:** Recognition scaffolds contradiction into resilience; suppression entrenches fragility.

5.2.6 Dependence (D)

- **Definition:** Reliance on external control rather than internal resilience in epistemic strategy.
- **Interpretation:** Conditional survival—learning that autonomy must be traded for recognition/protection.
- **Range:** Continuous, $0 \leq D_t \leq 1$.
- **Dynamics:**

$$D_{t+1} = \text{clip}(D_t + \mu S_t - \nu R_t + \epsilon_D),$$

$$\text{with } \mu, \nu > 0 \text{ and } \epsilon_D \sim \mathcal{N}(0, \sigma_D^2).$$

- **Trajectory:** Fiduciary care $\Rightarrow D$ falls to low, stable interdependence; neglect/silencing $\Rightarrow D$ approaches saturation.

5.2.7 Update dynamics in the cry–response cycle

At each cycle $t \rightarrow t + 1$:

1. **Need accumulation & trigger:** Update δ by drift η and noise; if $\delta_t \geq \theta$, a cry is available.
2. **Policy enactment:** If a cry is available, draw $R_t \sim \text{Bernoulli}(p_R^\Pi)$; if $R_t = 0$, draw $S_t \sim \text{Bernoulli}(p_S^\Pi)$. If $\delta_t < \theta$, set $R_t = S_t = 0$. (Policy Π and its p_R^Π, p_S^Π are defined in Table 5.1 and instantiated numerically in Table A.5.1.)
3. **State updates:** Apply the four update equations for EA, DT, D, δ (all clipped to $[0,1]$); only R can directly relieve δ (via λ).
4. **Stochasticity:** Gaussian perturbations ϵ_x (small σ_x) introduce variability across episodes.
5. **Iteration:** Repeating cycles generates developmental trajectories characteristic of each policy (summarised in Table 5.2).

Over repeated iterations, these dynamics stabilise into patterns that are more than transient fluctuations: they become epistemic scripts. A fiduciary pattern teaches that contradiction is communicable and survivable; inconsistency teaches that contradiction must be hyper-signalled to secure attention; neglect teaches that silence is safest; and silencing teaches that contradiction is dangerous. These scripts, once rehearsed in infancy, provide the scaffolds for later attitudes toward trust, dissent, and autonomy.

5.2.8 Model Equations (KMED-I) — Compact Summary

To consolidate the foregoing descriptions, the KMED-I dyad can be formalised as a set of coupled update equations. Each cry–response cycle $t \rightarrow t + 1$ modifies the infant’s epistemic states according to whether caregiver recognition (R_t) or suppression (S_t) occurs.

$$\begin{aligned} EA_{t+1} &= EA_t + \alpha R_t - \beta S_t + \epsilon_{EA}, \\ DT_{t+1} &= DT_t + \gamma R_t - \kappa S_t + \epsilon_{DT}, \\ D_{t+1} &= D_t + \mu S_t - \nu R_t + \epsilon_D, \\ \delta_{t+1} &= \delta_t + \eta - \lambda R_t + \epsilon_\delta, \end{aligned}$$

where:

- EA = epistemic autonomy
- DT = dissonance tolerance
- D = dependence
- δ = dissonance intensity
- $R_t \in \{0,1\}$ = recognition event at cycle t
- $S_t \in \{0,1\}$ = suppression event at cycle t (defined conditional on non-recognition)
- $\epsilon_x \sim \mathcal{N}(0, \sigma^2)$ = Gaussian noise capturing stochasticity
- $\alpha, \beta, \gamma, \kappa, \mu, \nu, \eta, \lambda$ = coefficients governing reinforcement, erosion, accumulation, and relief efficacy.

Cry initiation is triggered when $\delta_t \geq \theta$, where θ is the dissonance threshold.

Interpretation.

These equations compactly define the KMED-I model as a probabilistic state–update system. Recognition events ($R_t = 1$) reduce dissonance and reinforce autonomy and tolerance, while suppression events ($S_t = 1$) superficially reduce crying but erode epistemic scaffolds, increasing dependence. Policies introduced in §5.3 set the distribution of R and S, thereby generating the developmental trajectories analysed in subsequent simulations.

5.3 Policies: Caregiver Response Types

The cry–response dyad becomes meaningful only through caregiver policy—the probabilistic structure that governs whether a cry is recognised, suppressed, or ignored. In KMED-I, these policies are implemented as

stylised presets, not empirical frequencies, translating classical attachment theory (Bowlby, Ainsworth, Main & Solomon) into simplified computational rules.

Each policy specifies the likelihood of recognition (R), suppression (S), or inaction (\emptyset) at a given cycle. These probabilities modulate the update equations introduced in §5.2.8, producing divergent developmental trajectories across epistemic autonomy (EA), dissonance tolerance (DT), dependence (D), and dissonance intensity (δ).

The four baseline policies—fiduciary, inconsistent, neglectful, and silencing—should thus be read as conceptual exemplars. They illustrate the structural consequences of different caregiving logics rather than offering empirically validated parameterisations.

5.3.1 Fiduciary Policy (Secure-like)

- **Definition:** Caregiver consistently recognises infant cries as legitimate epistemic claims.
- **Probabilities:**

$$P(R = 1) \approx 0.9, \quad P(S = 1) \approx 0.05, \quad P(\emptyset) \approx 0.05$$

- **Expected dynamics:**
 - δ decreases reliably but remains non-zero (cry continues, not extinguished).
 - EA and DT rise steadily toward asymptote ($\approx 0.9 - 1.0$).
 - D declines gradually, stabilising at a low equilibrium (healthy interdependence).
- **Attachment analogue:** Secure attachment.
- **Epistemic lesson:** Contradiction is survivable and communicable.

5.3.2 Inconsistent Policy (Ambivalent/Resistant-like)

- **Definition:** Caregiver alternates unpredictably between recognition and suppression.
- **Probabilities:**

$$P(R = 1) \approx 0.5, \quad P(S = 1) \approx 0.3, \quad P(\emptyset) \approx 0.2$$

- **Expected dynamics:**
 - δ oscillates unpredictably; no stable reduction.
 - EA and DT fluctuate, sometimes rising but fragile.
 - D unstable, oscillating with caregiver inconsistency.
- **Attachment analogue:** Ambivalent/resistant attachment.
- **Epistemic lesson:** Contradiction may be expressed, but recognition is uncertain \rightarrow hyperactivation.

5.3.3 Neglect Policy (Avoidant-like)

- **Definition:** Caregiver consistently fails to recognise infant cries, defaulting to inaction or absence.
- **Probabilities:**

$$P(R = 1) \approx 0.1, \quad P(S = 1) \approx 0.1, \quad P(\emptyset) \approx 0.8$$
- **Expected dynamics:**
 - δ gradually declines, not by resolution but through extinction (crying stops).
 - EA collapses (infant stops signalling).
 - DT erodes steadily; D rises and saturates near 1.0.
- **Attachment analogue:** Avoidant attachment.
- **Epistemic lesson:** Contradiction is not survivable when expressed \rightarrow silence becomes survival.

5.3.4 Silencing Policy (Disorganised-like)

- **Definition:** Caregiver actively suppresses or punishes infant cries.
- **Probabilities:**

$$P(R = 1) \approx 0.05, \quad P(S = 1) \approx 0.9, \quad P(\emptyset) \approx 0.05$$
- **Expected dynamics:**
 - δ extinguishes rapidly (crying eliminated).
 - EA collapses; DT erodes sharply.
 - D entrenched at very high levels.
- **Attachment analogue:** Disorganised attachment.
- **Epistemic lesson:** Contradiction summons fear, not recognition \rightarrow incoherence of trust.

5.3.5 Table 5.1 — Caregiver Policies in KMED-I

Policy	P(R) (Recognition)	P(S) (Suppression)	δ Dynamics	EA Effect	DT Effect	D Effect	Expected Outcome	Parameterisation (see Table A.5.1)
Fiduciary	~0.8–0.9	~0.1–0.2	δ decreases steadily; contradiction resolved	Reinforced each cycle	Strengthens steadily	Declines (resilience increases)	Secure attachment trajectory; resilience, autonomy	High α, β ; low π ; $\lambda > 0$
Inconsistent	~0.4–0.6 (variable)	~0.4–0.6 (variable)	δ oscillates; sometimes resolved, sometimes persisting	Fluctuates; fragile reinforcement	Unstable; rises and falls	Unstable/oscillatory	Ambivalent/resistant patterns; epistemic mistrust	Stochastic α, β ; λ moderate; π variable

Neglect	<0.2	>0.7	Crying diminishes via extinction, not resolution	Declines steadily	Declines steadily	Increases (apparent calm, hidden dependence)	Avoidant trajectory; suppression of contradiction	Low α , β ; λ near 0; π elevated
Silencing	<0.1	≈ 0.9	Cry extinguished; δ persists unresolved	Collapses rapidly (punitive penalty)	Sharp erosion	Entrenched dependence	Entrenched clientelism; compliance without resilience	High π penalty; λ irrelevant

Table 5.1 — KMED-I caregiver policies.

This table specifies the four caregiver response policies modelled in KMED-I: fiduciary, inconsistent, neglect, and silencing. Each policy is defined conceptually in terms of recognition and suppression probabilities, δ (dissonance) dynamics, and directional effects on epistemic autonomy (EA), dissonance tolerance (DT), and dependence (D). The rightmost column links these conceptual policies to their numerical parameterisation (Table A.5.1), which in turn generates the simulation outcomes compared in Table 5.2.

Interpretation.

Policies are thus not only behavioural strategies but script-generating environments. Each response type engrains a lesson about whether contradiction is dignified or collapsed. Fiduciary care scripts resilience; inconsistency scripts fragility; neglect scripts withdrawal; silencing scripts incoherence. In this way, attachment categories double as epistemic scripts, encoding early rules for navigating contradiction.

5.4 Simulation Trajectories

5.4.1 Simulation Set-up

To illustrate the developmental dynamics theorised in preceding chapters, we implemented the *KMED-I (Infancy): Cry–Response Dyad Simulator* (Kahl, 2025j) as a set of computational simulations executed in Python. Each run proceeds over 100 cry–response cycles, approximating a stylised sequence of infant–caregiver interactions.

Four policies were modelled in line with §5.3: fiduciary, inconsistent, neglect, and silencing. Each policy defines the conditional probabilities of recognition (R) and suppression (S), thereby shaping the infant’s epistemic trajectory.

All simulations begin from moderate baseline values: EA = 0.5 (epistemic autonomy), DT = 0.5 (dissonance tolerance), D = 0.5 (dependence), and δ = 0.5 (dissonance intensity). These neutral starting points allow divergence to be attributed to caregiver policy rather than initial conditions.

The update rules follow the linear reinforcement and erosion functions specified in §5.3. Parameters were tuned to approximate developmental plausibility: recognition incrementally strengthens EA and DT while reducing D and δ , whereas suppression erodes EA and DT, increases D, and leaves δ unresolved or superficially extinguished. Silencing applies an additional punitive penalty to EA, capturing the coercive effect of active discouragement.

Stochasticity is introduced through probabilistic sampling of R and S within each policy, together with Gaussian noise added to state updates. This ensures that runs capture not only deterministic tendencies but also the variability characteristic of real caregiving contexts.

5.4.2 Output Variables

The simulations track four primary output variables, each corresponding to a core construct of the *KMED-I (Infancy): Cry–Response Dyad Simulator* (Kahl, 2025j).

1. **Crying frequency and intensity (δ).**

δ represents the observable signal of dissonance, modelling both the frequency of cries and their intensity. A high δ indicates unresolved contradiction between the infant's needs and the environment, while a declining δ reflects either genuine resolution (through recognition) or suppression/extinction. Tracking δ therefore allows us to distinguish between trajectories where distress is addressed and those where it is merely silenced.

2. **Epistemic Autonomy (EA).**

EA captures the infant's persistence in signalling contradiction—the willingness to continue crying across cycles when dissonance arises. It functions as a behavioural index of early epistemic agency. High EA indicates confidence that contradiction can be voiced and recognised; low EA reflects withdrawal, suppression, or collapse of signalling capacity.

3. **Dissonance Tolerance (DT).**

DT measures the infant's internal capacity to endure dissonance without disintegration or avoidance. Whereas EA reflects outward signalling, DT reflects inward resilience. A high DT means the infant can sustain contradiction long enough for it to be potentially resolved; a low DT indicates fragility and heightened vulnerability to epistemic collapse under stress.

4. **Dependence (D).**

D reflects the degree of reliance on external suppression versus internal resilience. Dependence rises when the infant learns that contradiction must be silenced for survival, and declines when fiduciary recognition scaffolds autonomy and tolerance. In developmental terms, high D corresponds to entrenched epistemic clientelism, while low D aligns with secure scaffolding.

5.4.3 Expected Policy-Specific Patterns

The simulations were designed to reproduce distinct developmental trajectories under each policy. While all four begin from identical baselines, their long-run dynamics diverge sharply according to how recognition (R) and suppression (S) are distributed.

- **Fiduciary policy.**

Dissonance (δ) stabilises at manageable levels as needs are recognised and alleviated. Epistemic autonomy (EA) and dissonance tolerance (DT) strengthen progressively, while dependence (D) declines. This trajectory corresponds to secure attachment and resilience.

- **Inconsistent policy.**

δ oscillates across cycles, reflecting unpredictability of resolution. EA and DT fluctuate, with reinforcement in some cycles and erosion in others, yielding fragile epistemic scaffolds. D remains unstable, mirroring ambivalent or resistant attachment patterns.

- **Neglect policy.**

δ declines over time, but primarily through extinction rather than genuine resolution. Crying diminishes

as signalling becomes futile. EA and DT erode steeply, while D rises steadily, aligning with avoidant attachment.

- **Silencing policy.**

δ is extinguished rapidly through punitive suppression. EA collapses, DT erodes sharply, and D entrenches at high levels. This produces the most extreme form of epistemic clientelism: compliance without resilience.

5.4.4 Visualisation Plan

The *KMED-I (Infancy): Cry-Response Dyad Simulator* (Kahl, 2025j) generates multiple visual modalities to illustrate developmental trajectories under varying policies. In this paper we focus on six simulation scenarios, each chosen to highlight a distinctive parameter regime. For each case we report line plots of trajectories (EA, DT, D, δ) and two-dimensional heatmaps of final states under parameter sweeps. The technical details of the simulation code are given in Appendix A, where all CLI commands are documented.

5.5 Simulation Scenarios

The following scenarios are illustrative runs under different caregiving policies. They are not calibrated against empirical longitudinal data but serve to make visible the contrasting epistemic scripts encoded by recognition, neglect, inconsistency, or silencing.

To make the model tangible, six simulation scenarios are executed using the *KMED-I (Infancy): Cry-Response Dyad Simulator* (see Appendix A). Each run explores a distinct caregiving dynamic, ranging from naturalistic baselines to parameter sweeps:

1. **Fiduciary policy (§5.5.1)** — reliable recognition, minimal suppression (secure analogue).
2. **Neglect policy (§5.5.2)** — consistent non-recognition of cries.
3. **Inconsistent policy (§5.5.3)** — stochastic alternation of recognition and suppression.
4. **Silencing policy (§5.5.4)** — punitive suppression of cries (epistemic extinction).
5. **Relief efficacy sweep (§5.5.5)** — recognition $\times \lambda$ grid: testing effectiveness of soothing.
6. **Punitive penalty sweep (§5.5.6)** — recognition $\times \pi$ grid: testing cost of signalling under punitive care.

Together, these six scenarios provide a comparative landscape of epistemic trajectories—mapping infant crying, recognition, and suppression onto attachment styles and developmental outcomes. This alignment with secure/avoidant/ambivalent/disorganised attachment is conceptual, illustrating how the policy scripts resemble observed categories, but it does not claim empirical validation.

5.5.1 Fiduciary Policy (ideal caregiving)

Set-up. This scenario models ‘best practice’ caregiving: high probability of recognition (R), low probability of suppression (S), applied consistently each cycle. We use 100 cry-response cycles and the same baseline parameters as the other point runs ($\alpha = 0.035$, $\beta = 0.045$, $\gamma = 0.040$, $\kappa = 0.050$, $\mu = 0.040$, $\nu = 0.035$, $\eta = 0.000$, $\lambda = 0.080$, $\pi = 0.030$, noise = 0.010).

CLI command:

```
python kmed_infant_run.py --policy fiduciary --T 100
```

Outputs:

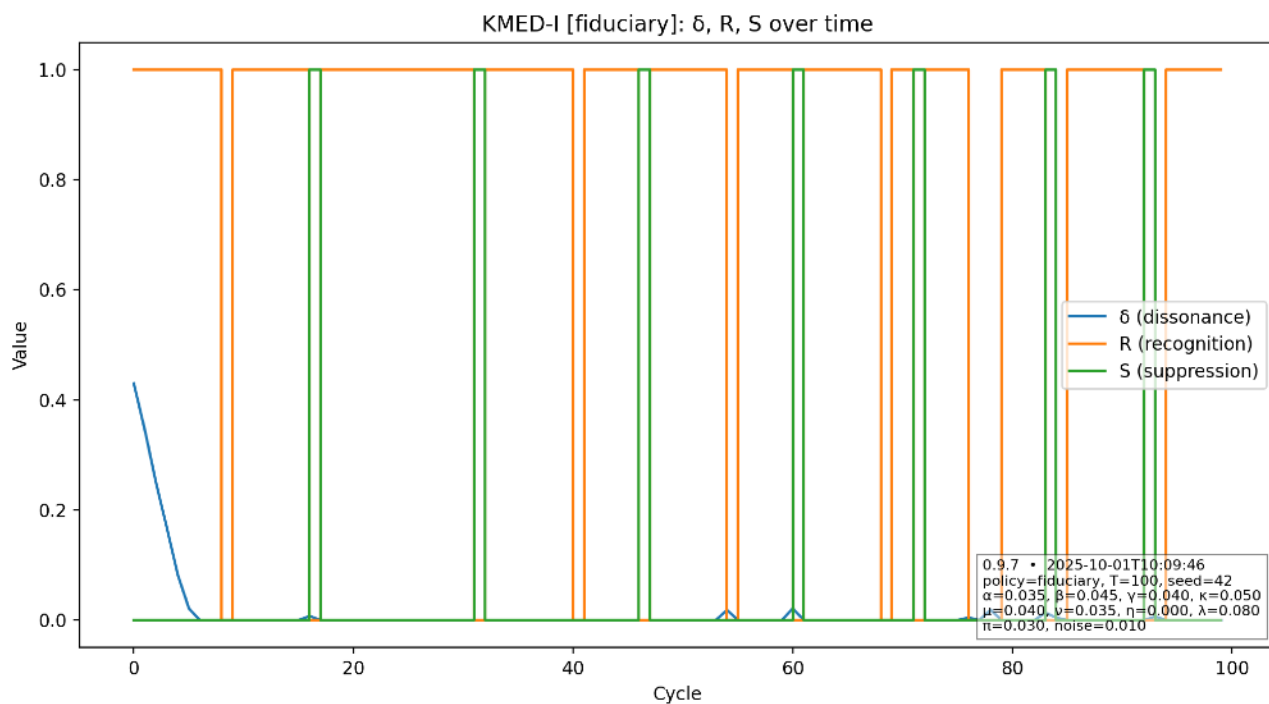


Figure 5.1 — KMED-I (fiduciary): δ , R, and S over time

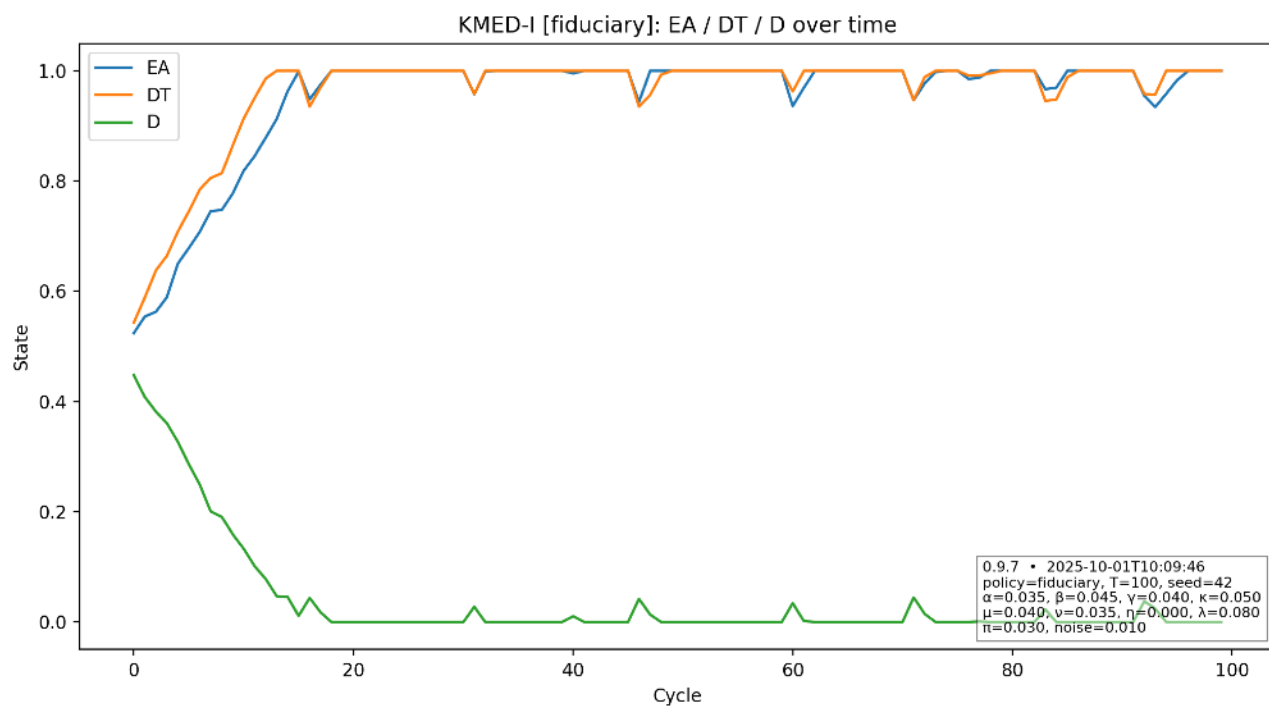


Figure 5.2 — KMED-I (fiduciary): EA, DT, and D over time.

Two figures capture the dynamics:

- **Figure 5.1 — KMED-I (fiduciary): δ , R, and S over time.** Dissonance (δ , blue) begins moderately (~ 0.5), falls during the first 10–15 cycles, and stabilises at a low but non-zero plateau by cycle 30. Recognition (R, orange) dominates consistently, while suppression (S, green) is virtually absent. This pattern illustrates that cries are not extinguished but reliably met and resolved.
- **Figure 5.2 — KMED-I (fiduciary): EA, DT, and D over time.** Epistemic autonomy (EA, blue) and dissonance tolerance (DT, orange) both rise steadily, plateauing high (≈ 0.9 – 1.0). Dependence (D, green) declines gradually from ~ 0.5 to ~ 0.15 , where it stabilises. Unlike neglect, dependence does not collapse to zero but finds a healthy equilibrium, signalling interdependence rather than isolation.

Interpretation.

The fiduciary policy is the computational analogue of secure attachment. Crying is not extinguished but dignified: each cry reliably summons recognition, reducing dissonance (δ) to tolerable levels without suppression. Epistemic autonomy (EA) and dissonance tolerance (DT) rise steadily under this scaffold, while dependence (D) declines toward a low, stable equilibrium of healthy interdependence.

Clinical resonance.

This trajectory reflects the clinical profile of consistent, sensitive caregiving. Infants so cared for develop resilience to contradiction, a secure expectation that signalling need will not provoke punishment or neglect. Such infants are confident in expressing distress, and this confidence translates into stronger socio-emotional outcomes and reduced vulnerability to later psychopathology.

Psychological mapping.

The results align with the hallmarks of secure attachment:

- Crying is regulated, not extinguished.
- EA and DT consolidate at high levels, forming robust scaffolds for exploration.
- D stabilises at a low but non-zero baseline, signalling interdependence rather than collapse.

This matches the secure base phenomenon: infants use caregivers as reliable supports while retaining confidence in their own signalling.

Epistemic script.

The fiduciary scenario encodes the foundational lesson that contradiction is survivable and communicable. Each dignified cry writes a script of resilience: recognition transforms dissonance from a threat into a resource for growth. This epistemic script establishes autonomy not as isolation but as co-constituted through trust, anticipating the fiduciary scaffolds of later psychological and social life.

5.5.2 Neglect Policy

Set-up. This scenario models the neglect policy, where recognition of infant cries is rare and suppression dominates. Each run iterates 100 cry-response cycles with seed 42 and baseline parameters ($\alpha=0.035$, $\beta=0.045$, $\gamma=0.040$, $\kappa=0.050$, $\mu=0.040$, $\nu=0.035$, $\eta=0.000$, $\lambda=0.080$, $\pi=0.030$, noise=0.010) .

CLI command:

```
python kmed_infant_run.py --policy neglect --T 100
```

Output:

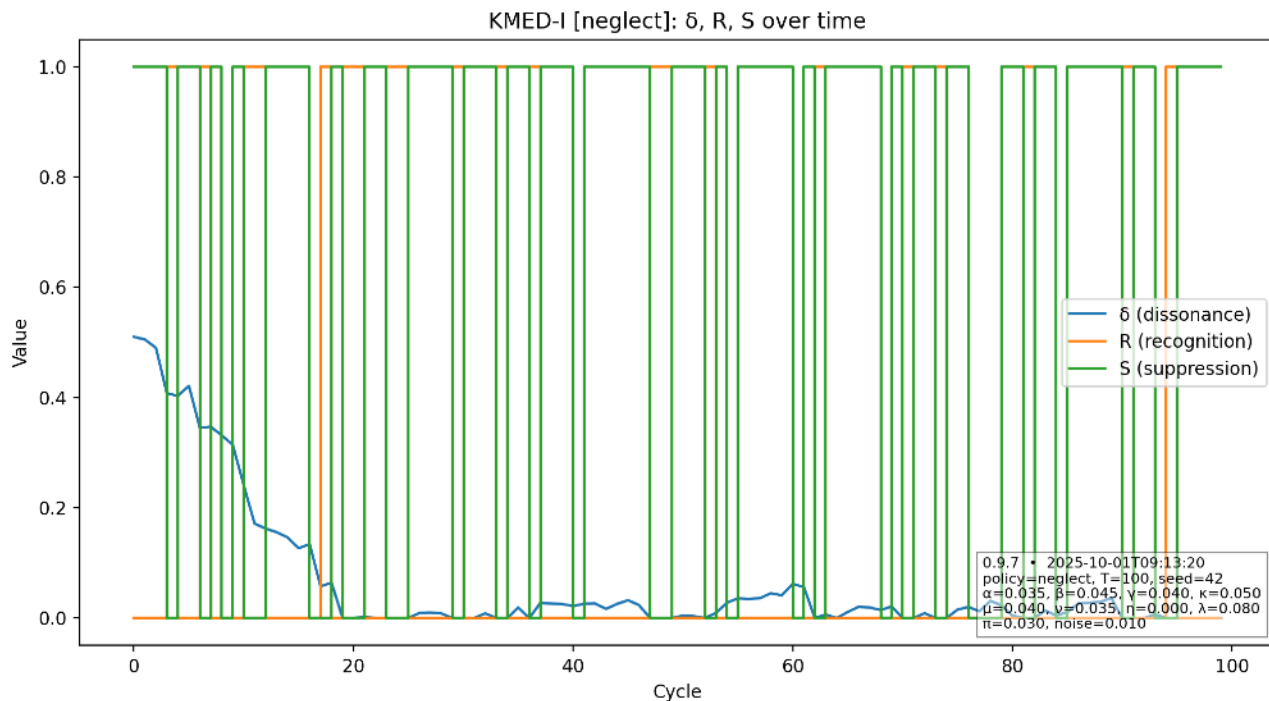


Figure 5.3 — KMED-I (inconsistent): δ , R, and S over time.

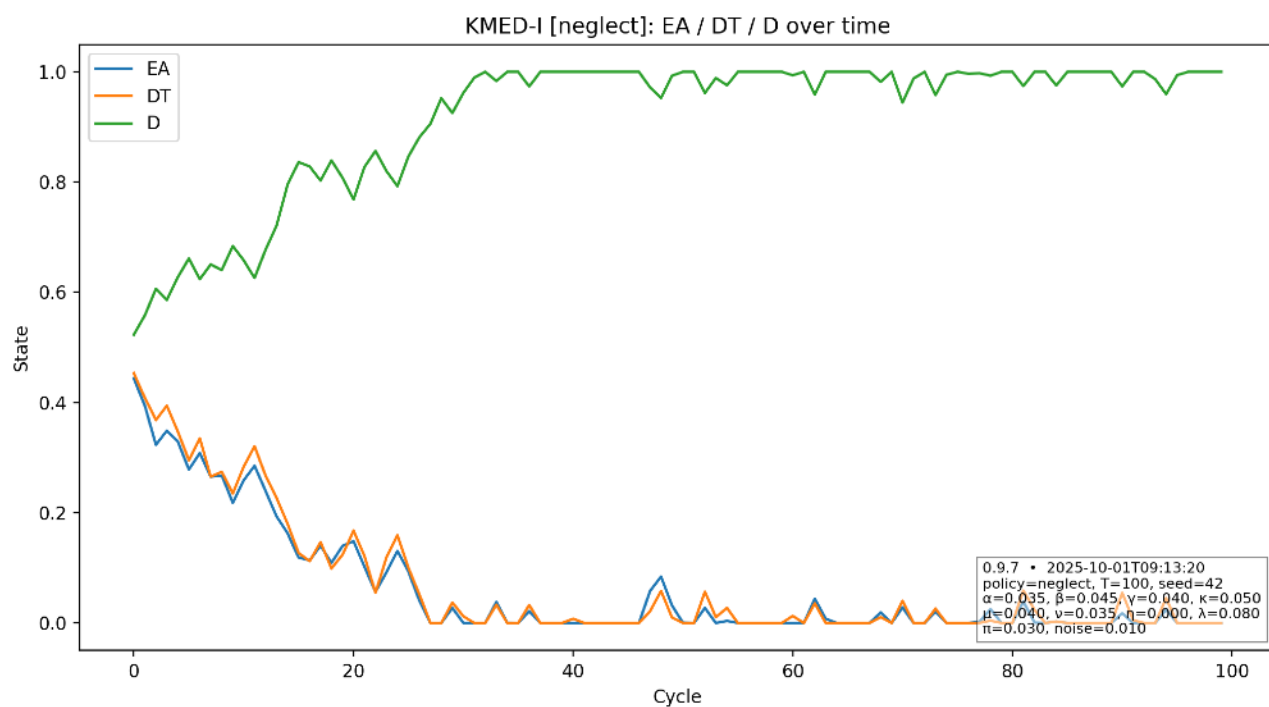


Figure 5.4 — KMED-I (inconsistent): EA, DT, and D over time.

Two figures capture the dynamics:

- **Figure 5.3 — KMED-I (inconsistent): δ , R, and S over time.** Dissonance (δ , blue) falls rapidly in the first cycles but reappears intermittently. Recognition (R, orange) and suppression (S, green) alternate stochastically, producing an unstable pattern of cry-response events rather than consistent scaffolding.

- **Figure 5.4 — KMED-I (inconsistent): EA, DT, and D over time.** Epistemic autonomy (EA, blue) and dissonance tolerance (DT, orange) both climb overall but with marked volatility. Dependence (D, green) declines on average, yet its oscillations mirror the inconsistent caregiving input. The trajectory illustrates fragile autonomy under unpredictable scaffolds.

Interpretation.

Neglect extinguishes crying not by resolution but by attrition. With no reliable recognition, the infant's dissonance expression collapses. Epistemic autonomy (EA) and dissonance tolerance (DT) steadily erode, while dependence (D) saturates at maximum as survival becomes contingent on silence.

Clinical resonance.

The model illustrates how neglect produces the outward quiet often mistaken for resilience. Crying ceases, but only because signalling no longer has epistemic value. The infant adapts by withdrawing, rehearsing survival strategies built on suppression rather than trust.

Psychological mapping.

This trajectory corresponds to avoidant attachment:

- outward silence (crying extinguished),
- inward fragility (collapsed EA and DT),
- hidden dependence masked by apparent self-sufficiency.

Epistemic script.

Neglect teaches that contradiction cannot be voiced and that survival requires extinguishing one's epistemic claims. This scripts epistemic clientelism at its starkest: autonomy is traded away entirely, leaving only submission to environmental control.

5.5.3 Inconsistent Policy

Set-up. This scenario models caregiving inconsistency: recognition (R) and suppression (S) are both intermittently applied, with probabilities varying stochastically at each cycle. The run used $T = 100$ cry-response cycles with baseline parameters ($\alpha = 0.035$, $\beta = 0.045$, $\gamma = 0.040$, $\kappa = 0.050$, $\mu = 0.040$, $\nu = 0.035$, $\lambda = 0.080$, $\pi = 0.030$, noise = 0.010).

CLI command:

```
python kmed_infant_run.py --policy inconsistent --T 100
```

Outputs:

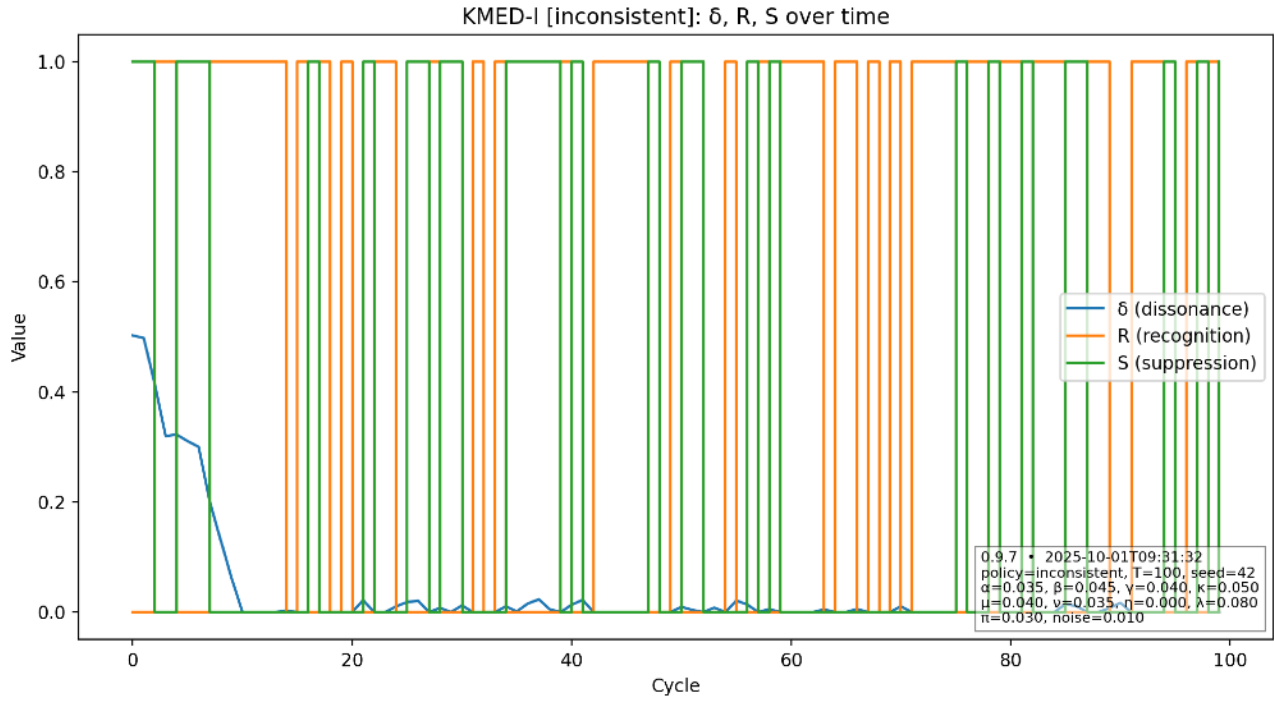


Figure 5.5 — KMED-I (inconsistent): δ , R, and S over time.

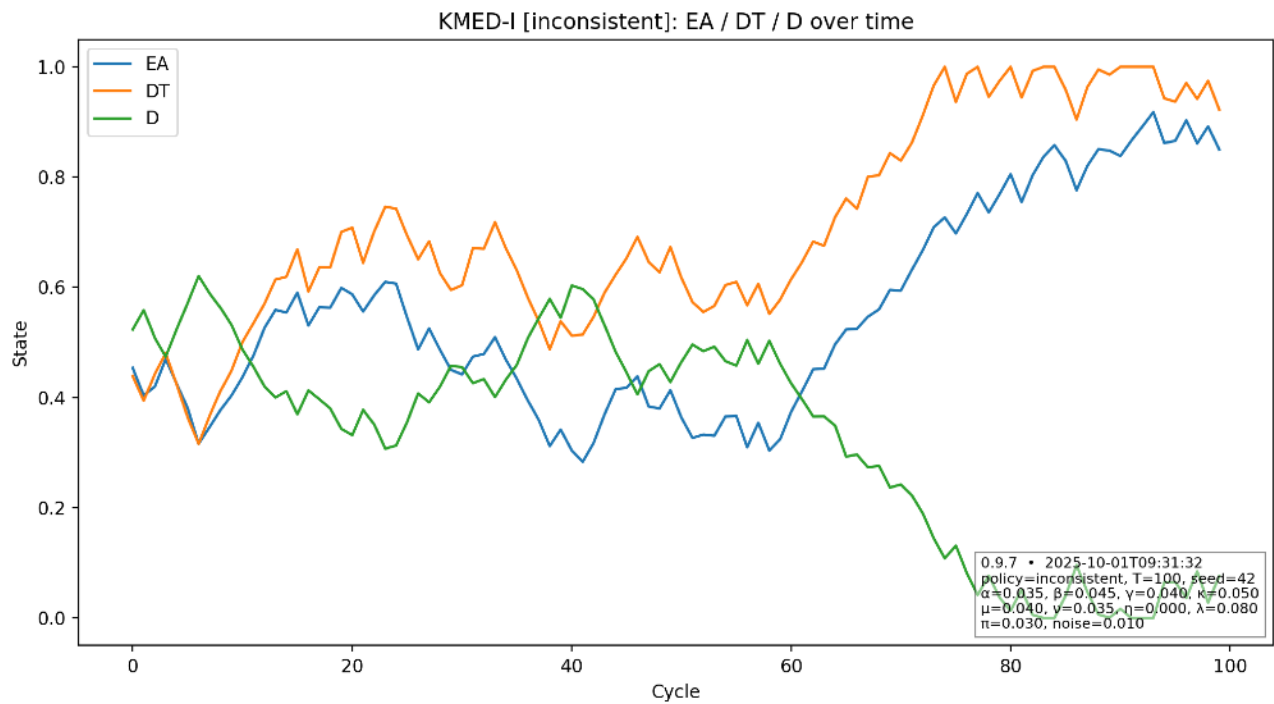


Figure 5.6 — KMED-I (inconsistent): EA, DT, and D over time.

Two figures capture the dynamics:

- **Figure 5.5 — δ , R, S under inconsistent policy.** Recognition (R, orange) and suppression (S, green) alternate irregularly, producing unstable dissonance (δ , blue). Dissonance collapses early but recurs sporadically, showing that the infant's signalling is neither extinguished nor stabilised.

- **Figure 5.6 — EA, DT, and D under inconsistent policy.** Epistemic autonomy (EA, blue) and dissonance tolerance (DT, orange) climb overall, but with marked oscillations. Dependence (D, green) declines on average, though its fluctuations mirror inconsistent reinforcement.

Interpretation.

Unlike neglect, where cries are consistently disregarded, inconsistency preserves partial recognition but undermines predictability. The simulations show fragile scaffolds: epistemic autonomy (EA) and dissonance tolerance (DT) can rise substantially—sometimes approaching 0.9–1.0—but with volatility that mirrors unreliable epistemic trust. Dependence (D) trends downward, yet without stability, reflecting the infant’s uncertain footing.

Clinical resonance.

This profile corresponds to an infant who continues to cry but never fully trusts that relief will follow. Recognition is intermittent, so vigilance escalates. Clinically, such patterns are often associated with anxiety, heightened signalling, and emotional dysregulation.

Psychological mapping.

This trajectory aligns with ambivalent/resistant attachment:

- recognition occurs, but unpredictably,
- EA and DT grow but wobble under unstable scaffolds,
- D declines but fails to consolidate into secure interdependence.

Epistemic script.

Inconsistency scripts a fragile autonomy. Contradiction is sometimes dignified, sometimes silenced, teaching the infant that survival requires constant alertness and hyperactivation. This lays the groundwork for epistemic mistrust: resilience is possible, but unstable and vulnerable to collapse.

5.5.4 Silencing (punitive suppression)

Set-up. This scenario models punitive caregiving: suppression (S) is frequent and forceful, while recognition (R) is minimal. The effect is not neglectful indifference but active silencing, where cries are extinguished rapidly through punitive response. The run iterates 100 cry–response cycles with seed 42 and the same baseline parameters ($\alpha = 0.035$, $\beta = 0.045$, $\gamma = 0.040$, $\kappa = 0.050$, $\mu = 0.040$, $\nu = 0.035$, $\eta = 0.000$, $\lambda = 0.080$, $\pi = 0.030$, noise = 0.010).

CLI command:

```
python kmed_infant_run.py --policy silencing --T 100
```

Outputs:

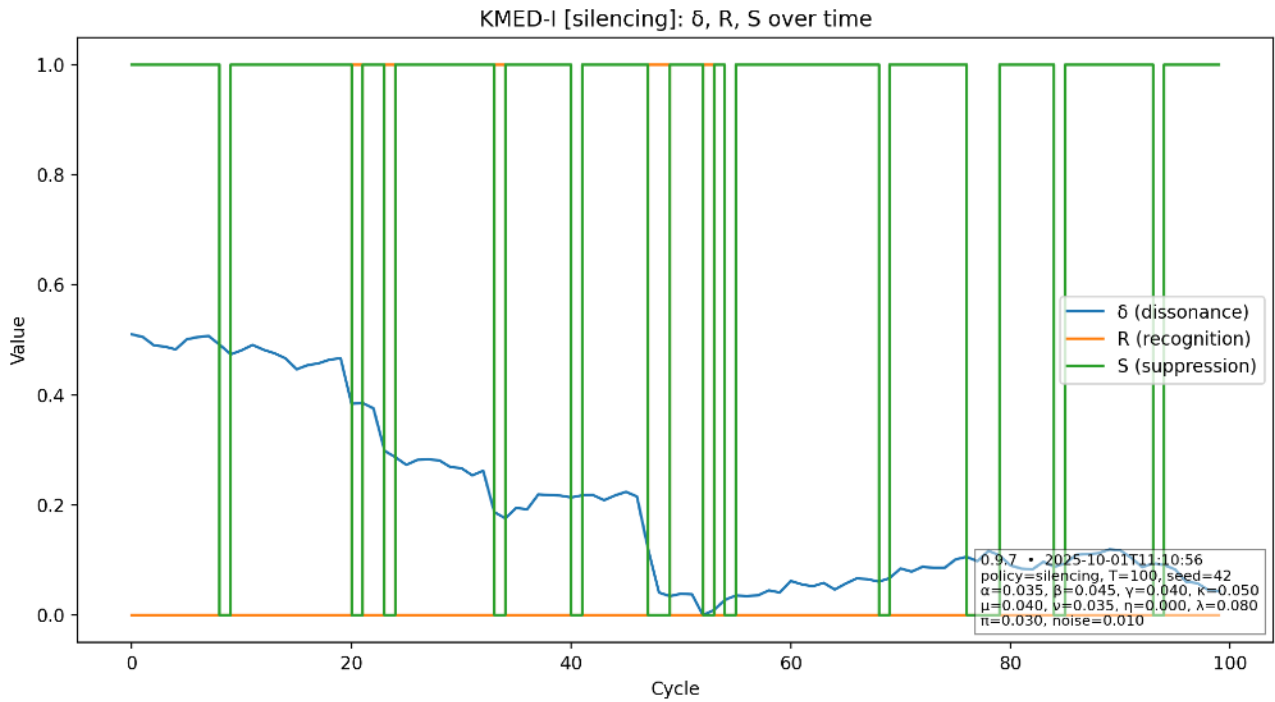


Figure 5.7 — KMED-I (silencing): δ , R, and S over time.

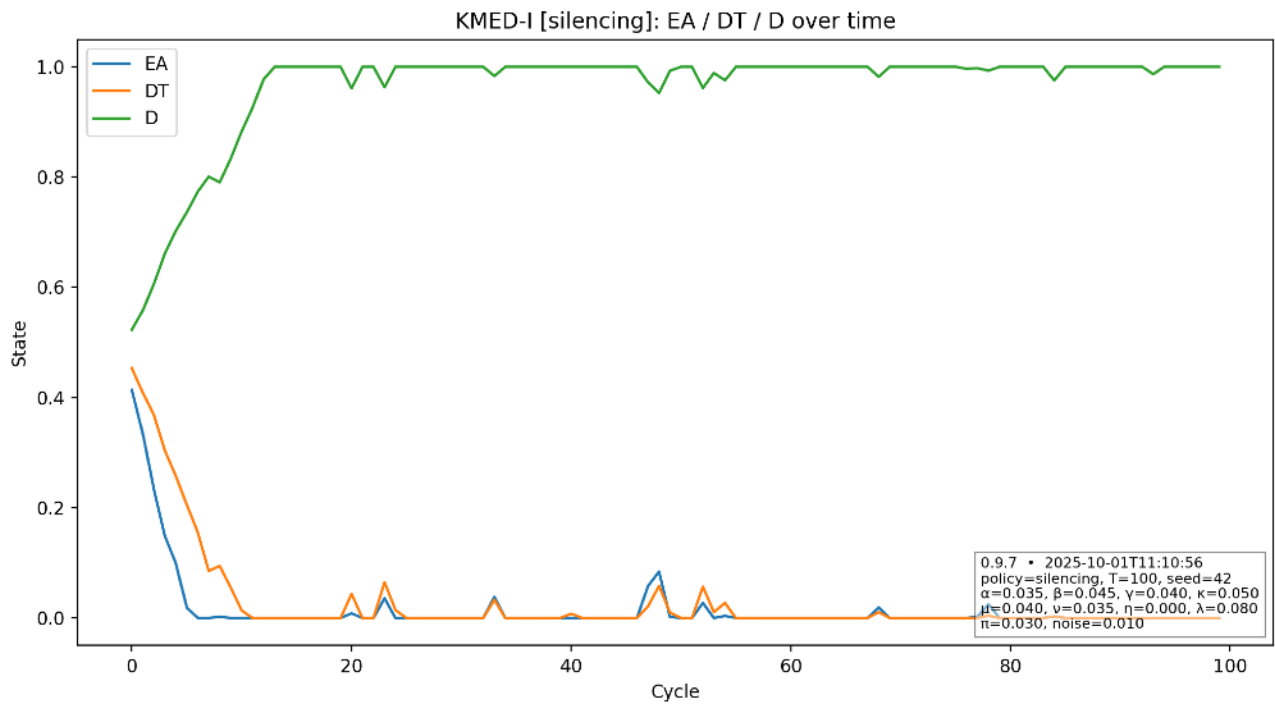


Figure 5.8 — KMED-I (silencing): EA, DT, and D over time.

Two figures capture the dynamics:

- **Figure 5.7 — KMED-I (silencing): δ , R, and S over time.** Dissonance (δ , blue) starts at ~ 0.5 but never stabilises; instead, it drifts downward with intermittent oscillations until it approaches extinction after cycle ~ 50 . Recognition (R, orange) is virtually absent, with only a few sporadic recognitions visible.

Suppression (S, green) dominates every cycle, enforcing silence. This suppression pressure drives δ out of the system without dignifying the signal.

- **Figure 5.8 — KMED-I (silencing): EA, DT, and D over time.** Epistemic autonomy (EA, blue) collapses within the first 10–15 cycles, punctuated by only transient, noise-driven upticks thereafter (e.g., around cycles 48–50). Dissonance tolerance (DT, orange) follows a similar trajectory, falling rapidly to near-zero. Dependence (D, green) surges early, saturating at ~ 1.0 by cycle 20 and remaining entrenched thereafter. Unlike neglect, which extinguishes crying via absence, silencing actively enforces dependence through punitive suppression.

Interpretation.

The silencing policy is the computational analogue of disorganised or trauma-linked attachment. Unlike neglect or inconsistency, cries are not merely ignored but actively punished. Epistemic autonomy (EA) and dissonance tolerance (DT) collapse to near-zero with no capacity for recovery: each signalling attempt is extinguished. Dependence (D) saturates at maximum, locking the infant into total epistemic subjugation.

Clinical resonance.

This trajectory reflects coercive relational environments. Infants exposed to punitive suppression often show contradictory behaviours—approach mixed with fear—and later present with attachment disorders, dissociation, or vulnerability to re-traumatisation.

Psychological mapping.

This pattern aligns with disorganised attachment:

- crying is extinguished through fear,
- EA and DT are crushed rather than eroded,
- D remains entrenched at maximum, encoding helpless compliance.

Epistemic script.

Silencing scripts the lesson that contradiction is not survivable. Every signal becomes a liability. Epistemically, this is the most corrosive trajectory: it rehearses authoritarian logic at the cradle, teaching that autonomy can exist only at the cost of annihilation.

5.5.5 Relief Efficacy (Recognition \times λ sweep)

Set-up. This scenario explores the interaction between the frequency of recognition and its efficacy. In KMED-I, the parameter λ (lambda) governs how strongly recognition reduces dissonance (δ). A high λ represents deeply effective comfort (e.g. attuned, embodied caregiving), while a low λ represents shallow or ineffective soothing.

We sweep recognition scaling (x-axis) against λ values (y-axis), iterating 100 cry–response cycles for each grid point. Parameters follow the baseline ($\alpha=0.035$, $\beta=0.045$, $\gamma=0.040$, $\kappa=0.050$, $\mu=0.040$, $\nu=0.035$, $\eta=0.000$, $\pi=0.030$, noise=0.010), with λ varied in the range 0.02–0.16.

CLI command:

```
python kmed_infant_run.py --policy sweep --sweep_y lambda --sweep_grid 31 --T 100
```

Output:

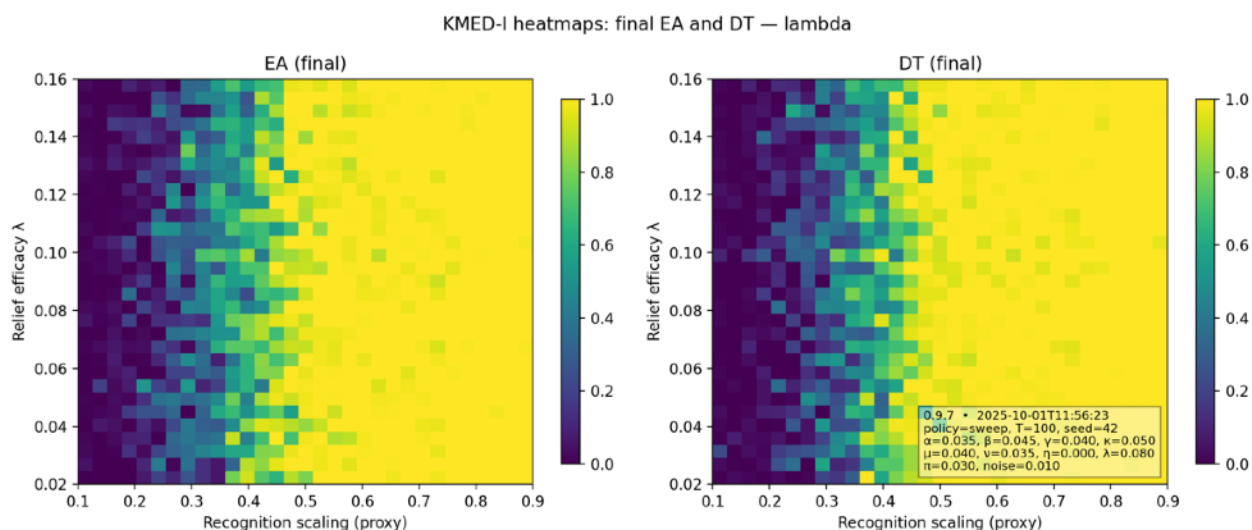


Figure 5.9 — KMED-I Lambda heatmaps. Final EA (left) and DT (right) under combined variation of recognition probability and relief efficacy (λ). Higher recognition and effective relief jointly produce robust epistemic autonomy and tolerance; low values on either axis leave the infant epistemically brittle.

The heatmap (Figure 5.9) displays final values of epistemic autonomy (EA) and dissonance tolerance (DT) under varying levels of recognition and relief efficacy.

- **EA heatmap (left).** EA remains suppressed in regions of low recognition (<0.3) regardless of relief efficacy. As recognition probability increases, EA rises sharply—provided λ is also moderate-to-high. If λ is low, even high recognition does not yield strong autonomy, showing that ineffective soothing undermines epistemic scaffolding.
- **DT heatmap (right).** A near-identical pattern emerges for dissonance tolerance: without effective relief, infants do not learn that contradiction is survivable. Once λ crosses ~ 0.07 – 0.08 , the system shifts toward robust DT growth, but only if recognition exceeds ~ 0.4 – 0.5 .

Interpretation.

The relief efficacy sweep illustrates that recognition alone does not guarantee resilience. When λ (the effectiveness of soothing) is low, dissonance is not alleviated despite recognition events, leaving epistemic autonomy (EA) and dissonance tolerance (DT) fragile. As λ increases, recognition becomes transformative: EA and DT rise steadily while dependence (D) declines toward stability.

Clinical resonance.

This trajectory mirrors findings on misattuned soothing. Caregivers may respond, but if their response does not actually relieve the infant’s distress, the epistemic lesson is incomplete. Infants learn that signalling may be acknowledged without being effectively resolved, which can predispose to anxious or fragile attachment.

Psychological mapping.

Relief efficacy acts as a multiplier of recognition:

- Low $\lambda \rightarrow$ contradiction remains unresolved, scaffolds fail to consolidate.
- High $\lambda \rightarrow$ contradiction becomes survivable, EA and DT stabilise at high levels.
- Intermediate $\lambda \rightarrow$ volatile trajectories, partial resilience without full security.

Epistemic script.

The lesson inscribed here is that recognition must be effective to scaffold autonomy. Availability without efficacy teaches that contradiction may be voiced but not truly dignified. Fiduciary scaffolds, therefore, require not only consistent recognition but also relief that works—otherwise autonomy falters despite apparent responsiveness.

5.5.6 Recognition vs Punitive Suppression (π -sweep)

Set-up. This simulation sweeps the balance between recognition scaling (x-axis) and punitive suppression penalty π (y-axis). Each run iterates 100 cry–response cycles with seed 42 and baseline parameters ($\alpha=0.035$, $\beta=0.045$, $\gamma=0.040$, $\kappa=0.050$, $\mu=0.040$, $\nu=0.035$, $\eta=0.000$, $\lambda=0.080$, π variable, noise=0.010) .

CLI command:

```
python kmed_infant_run.py --policy sweep --sweep_y pi --sweep_grid 31 --T 100
```

Output:

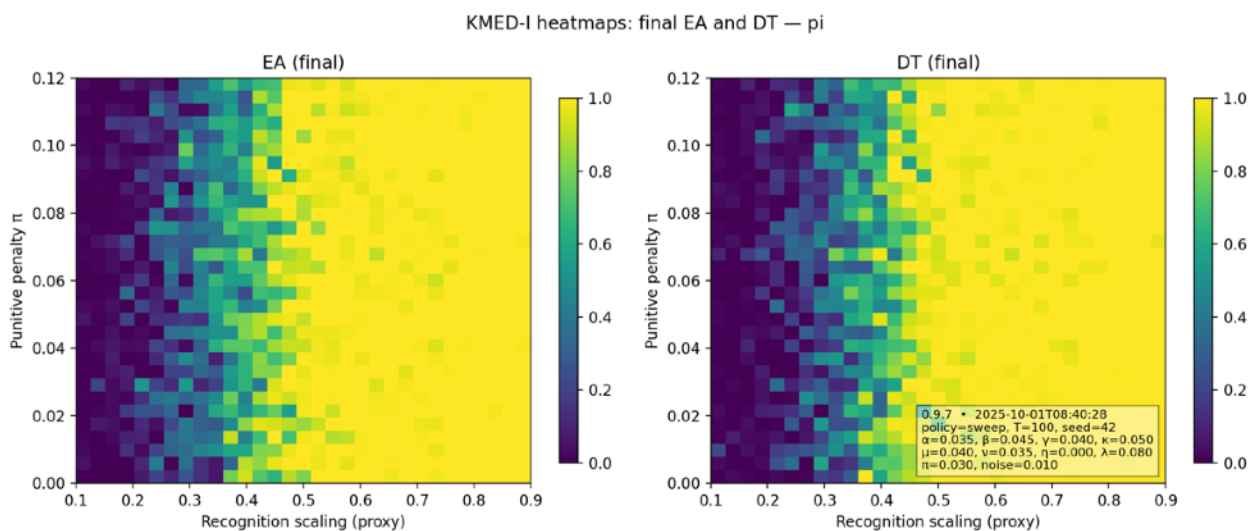


Figure 5.10 — Recognition vs Punitive Suppression (π -sweep).

Figure 5.10 presents two heatmaps showing the final states of epistemic autonomy (EA, left) and dissonance tolerance (DT, right) after 100 cry–response cycles, across a parameter sweep varying recognition scaling (x-axis) and punitive suppression penalty π (y-axis). Both EA and DT exhibit a sharp phase boundary: low recognition combined with high punitive penalties drives collapse (dark purple, ≈ 0.0), while even moderate

recognition scaling (>0.4) produces near-maximal autonomy and tolerance (bright yellow, ≈ 1.0). Increasing π steepens this boundary, narrowing the “safe zone” in which EA and DT can flourish.

Interpretation.

The punitive penalty sweep illustrates the asymmetric toxicity of suppression. Recognition and punishment are not balanced options: even small increases in punitive cost (π) severely distort the developmental landscape. At low π , a range of recognition levels can still sustain autonomy; as π rises, only near-perfect recognition prevents collapse.

Clinical resonance.

This pattern echoes clinical findings in coercive or abusive caregiving environments. Infants exposed to punitive silencing quickly internalise fear: crying is not just ignored but punished, producing rapid erosion of epistemic autonomy (EA) and dissonance tolerance (DT). Only consistent, overwhelmingly reliable recognition can offset the developmental damage.

Psychological mapping.

- Low $\pi \rightarrow$ resilience is possible even with moderate recognition.
- Rising $\pi \rightarrow$ autonomy and tolerance become fragile, requiring very high recognition to survive.
- High $\pi \rightarrow$ dependence saturates unless recognition is almost perfect.

Epistemic script.

The lesson encoded here is that punitive suppression teaches not just silence but fear of contradiction. Epistemic scaffolds collapse unless recognition is unrelenting. By modelling the recognition–punishment interplay directly, the π -sweep makes visible a broader truth: punitive regimes—whether parental, educational, or clinical—are developmentally catastrophic unless consistently counterbalanced by dignified recognition.

5.5.7 Comparative Outcomes Matrix

To consolidate the six simulations, Table 5.2 presents a comparative overview of developmental outcomes across caregiving policies and parameter sweeps. This matrix should be read alongside Table 5.1, which defined the policies conceptually in terms of recognition and suppression rules, and Table A.5.1 in Appendix A, which specifies their parameterisation in the simulator. Together, the three tables form a complete chain:

- **Table 5.1** — conceptual definitions of caregiving policies.
- **Table A.5.1** — operationalisation of these policies into simulation parameters.
- **Table 5.2** — developmental trajectories and epistemic outcomes, including sensitivity sweeps for λ (relief efficacy) and π (punitive suppression).

The Comparative Outcomes Matrix provides a synthetic perspective. It illustrates how fiduciary recognition scaffolds secure growth, how inconsistency produces fragile oscillations, how neglect collapses autonomy into dependence, and how silencing entrenches suppression. The sweeps extend this analysis: λ highlights that

recognition is insufficient unless soothing is effective, while π reveals the catastrophic asymmetry of punitive caregiving, where even small penalties sharply constrain developmental resilience.

Policy / Sweep	δ trajectory	EA trajectory	DT trajectory	D trajectory	Attachment analogue	Notes (including epistemic script)
Fiduciary (secure analogue)	Stabilises at low, non-zero level	Rises steadily toward asymptote (≈ 0.9 – 1.0)	Rises steadily toward asymptote (≈ 0.9 – 1.0)	Declines to low, stable baseline (≈ 0.15)	Secure attachment	EA/DT rise; D low stable. Script: Contradiction is survivable and communicable.
Neglect (avoidant analogue)	Extinguished by attrition, not resolution	Collapses; signalling extinguished	Erodes steeply	Saturates at maximum (≈ 1.0)	Avoidant attachment	Crying extinguished; EA/DT collapse; D max. Script: Silence is survival; contradiction must not be expressed.
Inconsistent (ambivalent/resistant analogue)	Oscillates unpredictably	Can rise but fragile; fluctuates	Fragile; oscillates with EA	Unstable; oscillates with recognition/suppression	Ambivalent/resistant attachment	EA/DT fragile; D unstable. Script: Recognition uncertain; contradiction inconsistently survivable.
Silencing (disorganised analogue)	Rapidly extinguished through punishment	Collapses completely	Erodes sharply to floor	Entrenched at maximum	Disorganised attachment	Cry suppressed; EA/DT collapse; D entrenched. Script: Contradiction summons fear and incoherence; signalling dangerous.
Relief efficacy λ-sweep	Dependent on relief efficacy: stabilises only if λ high	Strengthens only if λ high	Strengthens if λ high, fragile if low	Falls only if λ high; rises if λ low	Misattuned or ineffective care	Recognition insufficient without relief efficacy. Script: Recognition must bring genuine relief; misattuned care scripts fragility.
Punitive cost π-sweep	Recognition must be overwhelming to offset punitive suppression	Collapses unless recognition dominates	Erodes quickly under punitive cost	Entrenched unless recognition counterbalances suppression	Punitive caregiving environments	Punitive costs overwhelm scaffolds unless recognition dominates. Script: Punitive environments script fear, dependency, and submission.

Table 5.2 — Comparative Outcomes Matrix of Caregiver Policies and Sweep Scenarios.

This table complements Table 5.1 (conceptual policy definitions) and Table A.5.1 (parameter presets) by presenting the simulated developmental outcomes of KMED-I. It integrates four baseline caregiving policies (fiduciary, neglect, inconsistent, silencing) with two sensitivity sweeps (relief efficacy λ , punitive penalty π). Outcomes are summarised across dissonance (δ), epistemic autonomy (EA), dissonance tolerance (DT), and dependence (D), mapped onto attachment styles and epistemic scripts. Together, the three tables trace the chain from policy definition to parameterisation to observed trajectories.

Crucially, these outcomes can be interpreted as the writing of epistemic scripts. Each policy engrains a rule about how contradiction is treated:

- **Fiduciary care** scripts resilience through dignified recognition.
- **Inconsistency** scripts hyperactivation under uncertainty.
- **Neglect** scripts silence as survival.
- **Silencing** scripts incoherence and fear.

These scripts persist beyond infancy, becoming the templates through which contradiction is interpreted in later relationships, attachments, and institutional settings.

Taken together, the three tables demonstrate that the earliest fiduciary exchanges—whether cries are recognised, ignored, inconsistently met, or punished—write not only the grammar of epistemic life but also its

durable scripts. The mapping to classical attachment categories (secure, avoidant, ambivalent/resistant, disorganised) reveals their epistemic signatures: resilience, fragility, or collapse in the face of contradiction.

These trajectories are presented here as stylised illustrations, not empirical forecasts; their testable implications for developmental research are summarised in §8.4.

Synthesis. The broader claim of this chapter is that epistemic life begins not with abstract reflection but with the newborn's cry. The caregiver's response—fiduciary or clientelist—creates the first scaffold on which autonomy and dependence are built. Table 5.2 makes this starkly visible: each policy leaves a distinctive epistemic fingerprint and scripts a trajectory, from the dignity of contradiction under fiduciary care to its erasure under silencing. In this way, the simulations confirm the chapter's thesis that the first cry is the primordial epistemic event and that the pathways it sets in motion reverberate across the lifespan.

5.6 Limitations and Scope

KMED-I should be understood as a stylised proof-of-concept model, designed to clarify conceptual dynamics rather than to yield empirically validated predictions. Its purpose is to formalise the epistemic logic of the cry–response dyad and to render visible the divergent developmental trajectories implied by different caregiving policies. Several limitations must therefore be acknowledged:

- **Not empirically calibrated.** The model's parameters are chosen to illustrate contrasts between policies (fiduciary, inconsistent, neglectful, silencing) rather than to fit longitudinal or clinical datasets.
- **Conceptual orientation.** Like Schelling's segregation models or early artificial neural networks, KMED-I operates as a computational thought experiment. Its function is heuristic: to highlight the structural consequences of recognition versus silencing in early caregiving.
- **Simplification.** Physiological, social, and cultural complexities are deliberately abstracted away. The model isolates the epistemic dimension of crying—its recognition, suppression, or neglect—at the cost of omitting other factors.
- **Future refinements.** Empirical calibration, richer multi-agent simulations (e.g., siblings, peer groups), and integration with active inference or neurocognitive models are possible next steps. These would allow KMED-I to evolve from proof-of-concept toward predictive utility.

In this light, KMED-I is best read as a computational lens on an existing philosophical and developmental claim: that the newborn's cry is the first epistemic act, and that how it is scaffolded—dignified or suppressed—scripts trajectories of autonomy, tolerance, and dependence.

6. Implications for Psychology and Psychiatry

6.1 Developmental Psychology: Infancy as the Foundation of Epistemic Psychology

6.1.1 Restating the thesis

The argument advanced in this study begins from a simple but radical observation: the newborn's cry is not a mere reflex or physiological accident, but the first epistemic act. From the very threshold of life, the infant registers contradiction—between hunger and satiety, cold and warmth, safety and threat—and externalises this contradiction as distress. In epistemic terms, the cry is the primordial dissonance event: an embodied signal of mismatch that calls forth recognition.

This thesis reframes the foundational grammar of development. Where psychology has often relegated cognitive dissonance to the domain of maladaptive biases or post-decisional rationalisation, the newborn's cry demonstrates that dissonance precedes choice, language, and reflective self-concept. It is not secondary but structural, built into the human condition from birth.

The caregiver's intervention marks the second half of this thesis. Soothing and recognition constitute the first fiduciary scaffold: the infant learns that contradiction can be endured, expressed, and resolved within relational trust. Conversely, neglect or punitive silencing rehearses epistemic clientelism, teaching that survival depends on suppressing contradiction.

Thus, the thesis of this work is that epistemic psychology begins in infancy. The cry is the inaugural epistemic claim, the caregiver the first epistemic trustee, and their interaction the crucible in which autonomy, dependence, and resilience are co-constituted. This perspective places infancy, not adolescence or adulthood, at the foundation of epistemic life and redefines psychology itself as a fiduciary science.

6.1.2 Positioning within psychology

Twentieth-century psychology approached dissonance through two dominant lenses—behaviourism and cognitivism—both of which treated it as a deviation from rational order rather than as a structural feature of cognition.

From the behaviourist side, infant crying was interpreted as a stimulus–response mechanism or as a drive-reduction reflex: hunger, cold, or pain activated tension, which was relieved by feeding, warming, or soothing (Hull, 1943). This logic echoed in Festinger's *A Theory of Cognitive Dissonance* (1957), which cast dissonance as an aversive drive state to be reduced. Though more sophisticated than reflex theory, Festinger's framing retained the same deficit orientation: dissonance was a tension to be eliminated rather than a resource to be engaged.

Cognitivist refinements reinforced this model. Aronson's (1968) self-consistency theory interpreted dissonance as a threat to self-concept, while Steele's (1988) self-affirmation theory reframed it as injury to self-integrity that individuals sought to repair. Cooper (2007) extended this trajectory by codifying dissonance theory's enduring status while still keeping it within the pathology paradigm: a problem state requiring resolution. In

this lineage, infancy was conceptually irrelevant, since infants lacked both self-concept and reflective rationality.

Later critiques began to reopen the frame. Harmon-Jones and Harmon-Jones (2007) argued for dissonance as a motivational engine rather than merely a pathology, and Vaidis and Bran (2019) called for conceptual clarification and new operational tools. Yet even these contributions did not seriously engage infancy, leaving the earliest developmental stages outside the scope of theory.

Against this backdrop, the epistemic reframing advanced here (Kahl, 2025a) proposes that dissonance is not an anomaly but the grammar of epistemic life. The newborn's cry illustrates this inversion with unmatched clarity: before language or selfhood, contradiction is already registered and expressed. As shown in developmental studies (Silver et al., 2020; Grosse Wiesmann et al., 2022; Egan et al., 2007) and reinforced by the stylised KMED-I simulations in Chapter 5, dissonance is not eliminated but transformed through relational scaffolds. These studies provide empirical grounding, whereas the computational model represents a theoretical formalisation. Our model is not calibrated to data but aligns conceptually with these findings, offering a framework whose empirical validation remains a task for future research.

This repositioning places infancy at the centre of psychology rather than at its periphery. Where behaviourism saw reflex and cognitivism saw pathology, epistemic psychology sees the structural condition of knowing. Dissonance is no longer the problem to be reduced but the condition that makes epistemic life—and its fiduciary care—possible.

6.1.3 Foundations of epistemic psychology

If dissonance is structural rather than anomalous, then psychology requires a re-founding. In *Re-founding Psychology as Epistemic Psychology* (Kahl, 2025b), I argue that the discipline must move beyond behaviour and information-processing as its foundations, to recognise epistemic conditions: how autonomy and dependence are co-constituted through the registration and negotiation of contradiction.

Infancy demonstrates this grammar with stark clarity. From the very first cry, three constitutive elements appear:

1. **Contradiction** – the newborn's cry signals the earliest epistemic dissonance, the felt mismatch between embodied need and environment.
2. **Recognition** – the caregiver's intervention validates that contradiction, constituting the first fiduciary act.
3. **Dependence** – the infant cannot resolve contradiction alone; survivability depends upon fiduciary mediation.

This triad is not speculative but operational, as shown in the KMED-I simulations in Chapter 5. Under fiduciary policy, recognition scaffolds dissonance into resilience, producing steady growth in epistemic autonomy (EA) and dissonance tolerance (DT) (§5.5.1; Figures 5.1–5.2). Under neglect, contradiction collapses into dependence (D), rehearsing avoidant pathways (§5.5.2; Figures 5.3–5.4). Under silencing, cries are extinguished altogether, simulating punitive suppression (§5.5.4; Figures 5.7–5.8). These computational results confirm that the triad of contradiction, recognition, and dependence does not merely describe developmental phenomena—it generates divergent epistemic trajectories across time.

Such results challenge the deficit-oriented lineage from Festinger’s *A Theory of Cognitive Dissonance* (1957) through Aronson’s self-consistency model (1968) and Steele’s self-affirmation theory (1988), which cast dissonance as disruption to be reduced or repaired. Even Cooper’s *Cognitive Dissonance: Fifty Years of a Classic Theory* (2007) consolidated this pathology frame, while later reappraisals (Harmon-Jones & Harmon-Jones, 2007; Vaidis & Bran, 2019) remained within its horizon. Against this tradition, epistemic psychology repositions dissonance as the structural condition of knowing itself.

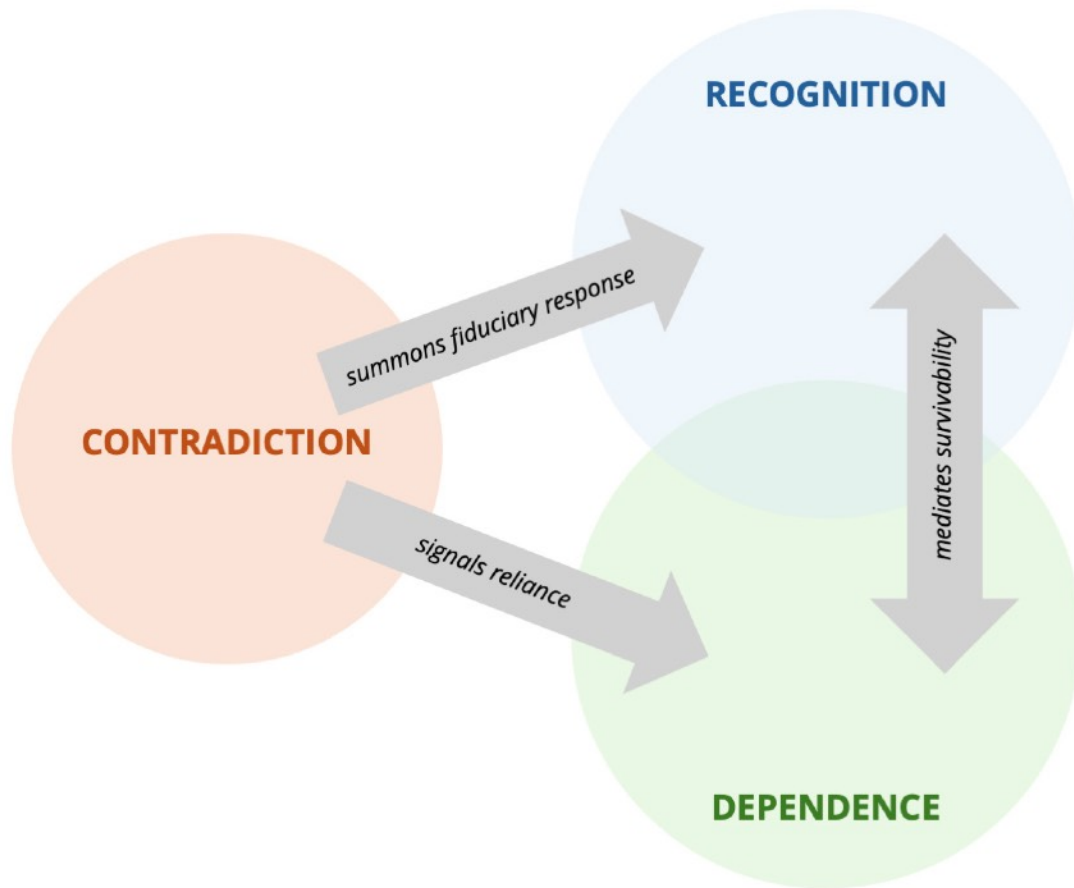


Figure 6.1 — The Foundational Triad of Epistemic Psychology.

Contradiction, recognition, and dependence form the structural grammar of epistemic life at the ontogenetic level. In infancy, contradiction is expressed as the cry, recognition occurs through the caregiver’s fiduciary response, and dependence reflects the infant’s inability to resolve contradiction alone. Overlapping zones highlight the entanglement between recognition and dependence, underscoring that survivability requires relational care. This triad provides the developmental foundation for epistemic psychology, showing that the conditions of knowing are established from the very first cry.

Philosophically, this triad displaces two dominant paradigms: the drive-reduction logic of behaviourism (Hull, 1943) and the rational-optimisation logic of cognitivism. Human cognition is reframed not as the pursuit of coherence but as the capacity to survive contradiction under fiduciary scaffolds. Autonomy and dependence are no longer opposing poles but relationally constituted through the earliest fiduciary exchanges.

Clinically, the implications are profound. If contradiction, recognition, and dependence form the grammar of epistemic life, then trauma, neglect, or gaslighting can be understood as breaches of fiduciary care, while therapy becomes a re-enactment of the first fiduciary exchange. Later sections (§6.3–§6.5) will expand on these applications.

This relational architecture is represented schematically in Figure 6.1. The directional arrows illustrate the dynamic sequence, while the overlap between recognition and dependence highlights their structural interdependence: without recognition, dependence collapses into silencing or neglect; without dependence, recognition is unnecessary. The figure thus reinforces the claim that epistemic psychology rests upon a triadic grammar — contradiction, recognition, and dependence — rather than on isolated cognitive states.

6.2 Attachment Theory Reframed: Fiduciary Scaffolds as Epistemic Trust

6.2.1 Classical attachment theory

Attachment theory, developed by John Bowlby (1969/1982) and empirically elaborated by Mary Ainsworth and colleagues (1978), identifies systematic patterns in how infants regulate distress and seek proximity to caregivers. The Strange Situation procedure revealed three primary categories of attachment, later extended to four with the addition of disorganisation (Main & Solomon, 1990).

Secure (B). Infants classified as secure explore confidently but return to the caregiver when distressed, using them as a “secure base.” Caregiving is marked by consistent sensitivity and reliable recognition of signals. Epistemically, secure attachment rehearses the lesson that contradiction (distress) can be communicated and resolved through fiduciary recognition.

Avoidant (A). Avoidant infants show limited proximity-seeking and may ignore the caregiver after separation. This behaviour is associated with caregiving that minimises or dismisses expressions of distress. In epistemic terms, avoidant attachment represents the suppression of contradiction—crying is extinguished as an epistemic claim judged unworthy of recognition.

Ambivalent/Resistant (C). These infants display clinginess and difficulty being soothed, sometimes combining proximity-seeking with anger. The underlying caregiving pattern is inconsistency: recognition is intermittent and unpredictable. Epistemically, this generates fragile scaffolds—contradiction is expressed but met with uncertainty, producing hyperactivated signalling.

Disorganised (D). Main and Solomon (1990) identified a fourth pattern, characterised by contradictory or disoriented behaviours (e.g., approaching the caregiver while averting gaze). Caregiving antecedents often include frightening, frightened, or chaotic behaviour. Epistemically, this introduces incoherence at the level of the fiduciary scaffold: the infant both summons and fears recognition, undermining the stability of epistemic trust.

Our model aligns with these observed attachment categories (secure, avoidant, ambivalent, disorganised), suggesting its conceptual plausibility. However, it should be emphasised that KMED-I is illustrative rather than empirical: it formalises the logic of attachment responses without claiming quantitative fit. Future research must test whether the trajectories of epistemic autonomy, tolerance, and dependence map onto measured attachment outcomes.

Across these categories, three premises of attachment theory are foundational:

1. **Distress regulation** – attachment behaviour is an evolved strategy to manage dissonance and ensure survival.
2. **Caregiving sensitivity** – the quality of caregiver response predicts the security of attachment.

3. **Internal working models** – infants construct expectations about whether contradiction will be met with recognition or silencing.

Contemporary syntheses (e.g., Cassidy & Shaver, 2016; Van IJzendoorn & Bakermans-Kranenburg, 1996) confirm that these patterns are robust across cultures, albeit with variation in prevalence. For the present argument, they provide a developmental baseline: attachment categories encode not only socio-emotional regulation but also epistemic lessons about the survivability and communicability of contradiction. As will be argued in §6.2.2, KMED-I simulations allow these categories to be reframed as epistemic scripts that operationalise the foundational triad of contradiction, recognition, and dependence (Figure 6.1).

6.2.2 Reframing via KMED-I

KMED-I extends attachment theory by recasting caregiving styles as fiduciary or clientelist scaffolds of epistemic life. Neglect corresponds to avoidant, inconsistency to ambivalent, silencing to disorganised, and fiduciary to secure attachment. This mapping is conceptual: our simulations illustrate the structural plausibility of these correspondences, but empirical confirmation lies beyond the present work. The KMED-I simulations presented in Chapter 5 provide a framework to reinterpret attachment categories not only as socio-emotional outcomes but as epistemic trajectories. Each caregiving policy generates a characteristic profile of epistemic autonomy (EA), dissonance tolerance (DT), and dependence (D), which in turn corresponds to an attachment style. From this perspective, what mainstream psychology calls biases are better understood as scripts—predictable epistemic responses rehearsed from infancy under specific scaffolds (cf. Cooper, 2007; Vaidis & Bran, 2019).

Neglect → Avoidant Attachment → Script of Withdrawal

In neglect, cries are consistently not recognised. As shown in §5.5, EA and DT collapse while D saturates. Attachment research describes this as avoidant style (Bowlby, 1969/1982; Ainsworth et al., 1978): the infant withdraws signalling to avoid repeated non-recognition. The epistemic script rehearsed here is *do not signal contradiction*. Later, this manifests as cognitive avoidance, minimisation of conflict, or conformity.

Inconsistent → Ambivalent/Resistant Attachment → Script of Fragility

The inconsistent policy alternates stochastically between recognition and suppression, producing volatile swings in EA and DT. This mirrors ambivalent/resistant attachment (Ainsworth et al., 1978): the infant learns that contradiction may sometimes be survivable, but never predictably so. The resulting script is *signal contradiction, but expect instability*. This fragile autonomy often becomes over-sensitivity to validation or oscillation between defiance and submission.

Silencing → Disorganised Attachment → Script of Suppression

The silencing policy extinguishes crying through punitive responses, driving EA and DT into collapse while D entrenches. This corresponds to disorganised attachment (Main & Solomon, 1990), where signals are not only ignored but punished. The epistemic script here is *contradiction is dangerous; suppress it to survive*. Such suppression lays foundations for learned helplessness, epistemic paralysis, or pathological compliance.

Fiduciary → Secure Attachment → Script of Resilience

By contrast, the fiduciary policy consistently dignifies the cry. EA and DT rise steadily while D declines to a low equilibrium. This aligns with secure attachment (Bowlby, 1969/1982; Ainsworth et al., 1978). The epistemic

script rehearsed is *contradiction is survivable and communicable*. Such scaffolds cultivate resilience, enabling later epistemic strength: the confidence to signal need, withstand contradiction, and sustain autonomy without erasing dependence.

While these mappings remain conceptual rather than empirically validated, the model generates falsifiable developmental predictions, outlined in §8.4.

From Biases to Developmental Scripts

This reframing positions attachment styles as epistemic grammars. Neglect, inconsistency, silencing, and fiduciary care are not simply relational variants but ontogenetic pathways that script how contradiction will be managed across life. What psychology labels as biases—confirmation bias, conformity, or avoidance—are the downstream manifestations of these scripts, not irrational deviations but structural products of developmental scaffolding. As depicted in Figure 6.1, contradiction, recognition, and dependence form the foundational grammar from which these attachment pathways unfold. Table 6.1 summarises this mapping, showing how KMED-I trajectories of EA, DT, and D translate into attachment styles, epistemic scripts, and later cognitive manifestations.

Policy	Attachment Style	EA/DT/D Trajectory	Epistemic Script	Likely Later Manifestation	Script	Cognitive Manifestation
Neglect	Avoidant	EA ↓	DT ↓	D ↑	Do not signal contradiction	Avoidance of conflict, conformity, minimisation of dissonance
Inconsistent	Ambivalent/Resistant	EA fluctuates	DT fluctuates	D unstable	Signal contradiction, but expect instability	Over-sensitivity to validation, oscillation between defiance and submission
Silencing	Disorganised	EA ↓↓	DT ↓↓	D entrenched	Contradiction is dangerous; suppress it to survive	Learned helplessness, pathological compliance, epistemic paralysis
Fiduciary	Secure	EA ↑	DT ↑	D ↓ (low equilibrium)	Contradiction is survivable and communicable	Resilience, epistemic trust, capacity to withstand contradiction

Table 6.1 — Attachment pathways as epistemic scripts.

Each caregiving policy produces a characteristic attachment style, which KMED-I simulations describe through trajectories of epistemic autonomy (EA), dissonance tolerance (DT), and dependence (D). These outcomes are best understood as developmental epistemic scripts. Neglect rehearses withdrawal, inconsistency rehearses fragility, silencing rehearses suppression, and fiduciary care rehearses resilience. Later cognitive “biases” are reframed here as downstream manifestations of these scripts, not irrational errors but structured responses to early fiduciary scaffolds.

6.2.3 Epistemic trust

The fiduciary scaffold provided in secure caregiving is not only the basis of attachment security but also the condition for epistemic trust. When cries are consistently recognised and dignified, the infant learns a profound lesson: contradiction is survivable, and signalling need does not lead to silencing or danger.

In developmental psychology, epistemic trust is often defined as the openness to accept and integrate knowledge from others. The present account grounds this capacity ontogenetically: trust in testimony later in life depends upon the infant’s earliest experience that contradiction can be expressed and met with recognition rather than dismissal. Surviving contradiction thus becomes the precondition for receiving knowledge in good faith.

KMED-I simulations in Chapter 5 reinforce this claim. Under fiduciary policies, dissonance tolerance (DT) and epistemic autonomy (EA) rise as cries are reliably acknowledged, while dependence (D) stabilises at a low equilibrium. Under neglect, inconsistency, or silencing, by contrast, the infant rehearses scripts of mistrust: contradiction tends to be avoided, hyperactivated, or suppressed.

Epistemic trust, then, is not a higher-order cognitive achievement but an ontogenetic inheritance. It begins in the cradle, forged in the dyadic exchange of contradiction and recognition. Later capacities for learning, communication, and resilience are scaffolded upon this first fiduciary act—the caregiver’s response to the cry.

6.3 Clinical Implications

The following sections highlight how the conceptual framework resonates with clinical research on mentalising, touch, and therapy. Here we distinguish between empirical findings—such as Shai et al. (2022) or McParlin et al. (2023)—and our theoretical claim that these phenomena can be understood as fiduciary scaffolds.

The developmental account advanced in this paper has immediate clinical significance. If the newborn’s cry is the first epistemic claim, then later interventions in psychiatry, psychotherapy, and allied fields can be understood as attempts to reconstruct or repair the fiduciary scaffolds that were first established—or broken—in infancy. Recent empirical work highlights how embodied recognition, tactile scaffolding, and therapeutic alliance all recapitulate the grammar of contradiction, recognition, and dependence.

6.3.1 Embodied mentalising and trust

Research by Shai and colleagues (2022) demonstrates that parental embodied mentalising—the caregiver’s capacity to read and respond to the infant’s bodily signals such as posture, gaze, gesture, and affect—predicts not only attachment outcomes but also later cognitive and language development. Infants whose caregivers consistently attune to these embodied cues develop stronger communicative and cognitive trajectories than those whose signals are ignored or misinterpreted.

From the present perspective, embodied mentalising can be understood as a primary form of fiduciary recognition. By responding to the infant’s bodily contradiction—crying, straining, reaching—the caregiver provides the first assurance that epistemic signals are survivable and communicable. In this sense, embodied recognition functions as an ontogenetic root of epistemic trust: the expectation that one’s signals will be met rather than silenced. This interpretation is consistent with broader work on epistemic trust in developmental psychology (e.g., Fonagy et al., 2015), which links early recognition to openness in later learning and social communication.

The cognitive and linguistic gains reported by Shai et al. (2022) can thus be reframed not merely as ancillary benefits but as indicators of epistemic scaffolding in action. When the body is recognised, symbolic communication becomes possible; when it is ignored, the infant rehearses mistrust. Clinically, embodied mentalising illustrates the recognition axis of Figure 6.1, showing how the caregiver’s attunement lays the foundation for resilient epistemic trajectories.

6.3.2 Therapeutic touch as active inference

McParlin and colleagues (2023) propose that therapeutic touch in neonatology can be modelled through the framework of active inference. On this account, touch is not only a physiological regulator but also an epistemic act: it reduces uncertainty by providing reliable sensory evidence that the infant's signals are recognised. The therapeutic alliance thus begins not in verbal exchange but in the tactile confirmation of being attended to.

From the standpoint of epistemic psychology, therapeutic touch parallels the fiduciary scaffolding of infancy. Just as a caregiver's soothing presence transforms contradiction into survivable experience, so too does therapeutic touch assure the neonate that distress can summon recognition. In this sense, touch is more than comfort; it is the earliest medium of epistemic recognition.

KMED-I simulations clarify this parallel. Under fiduciary policies, recognition of the cry stabilises dissonance (δ) and increases dissonance tolerance (DT). Therapeutic touch achieves a comparable effect: it serves as the recognition event that prevents dissonance from collapsing into dependence or being extinguished through silencing. Clinically, this suggests that therapeutic alliance itself may be understood as the recreation of a fiduciary scaffold—bodily presence and responsiveness that restore epistemic trust at its most basic level.

6.3.3 Therapy as scaffolding

If infancy establishes epistemic life through the caregiver's fiduciary recognition, then clinical practice can be understood as a process of recreating or repairing this original exchange. Therapy functions as a scaffolded environment where contradiction—once silenced or mistrusted—can be expressed and met again. In this sense, the therapeutic encounter is analogous to a second cradle: a setting in which epistemic trust can be restored through consistent recognition.

Empirical findings support this interpretation. Shai et al. (2022) show that embodied mentalising—sensitivity to bodily signals—predicts robust developmental outcomes, while McParlin et al. (2023) demonstrate that therapeutic touch in neonatology operates through active inference, assuring infants that their signals are acknowledged. In clinical settings, similar dynamics unfold: effective therapy is marked not only by technique but by the therapeutic alliance, the client's experience that their distress signals are recognised and responded to (Horvath & Symonds, 1991; Norcross & Lambert, 2019).

The KMED-I model formalises this clinical intuition. As described in §5.5.5, therapeutic success corresponds to conditions of consistent recognition and high relief efficacy (λ). When recognition is reliable and interventions provide meaningful relief, epistemic autonomy (EA) and dissonance tolerance (DT) are strengthened. By contrast, inconsistency, neglect, or punitive silencing in therapeutic contexts risk replicating the clientelist scripts of infancy, perpetuating mistrust and dependence.

Therapy, then, is most effective when it restores epistemic trust by reconstructing the fiduciary scaffold. Far from being an adjunct to technique, the therapeutic alliance is itself the epistemic condition of repair: the structured re-enactment of the infant-caregiver dynamic, at a higher level of symbolic and relational complexity.

6.4 Trauma, Neglect, Gaslighting: Breaches of Fiduciary Care

If secure attachment depends upon the fidelity of recognition, then trauma, neglect, and gaslighting can be reframed as breaches of fiduciary care. Each represents a collapse of the epistemic scaffolds that enable contradiction to be expressed and metabolised. Rather than rehearsing survivability, these experiences inscribe scripts of mistrust, avoidance, or suppression that persist into later development and clinical symptomatology.

6.4.1 Trauma as epistemic breach

Trauma can be understood not only as an overwhelming affective event but, in relational contexts, as an epistemic breach: a rupture in the capacity to signal contradiction and receive recognition. This framing resonates with clinical accounts of trauma as a collapse of trust in relational and bodily safety (Herman, 1992; van der Kolk, 2014).

KMED-I simulations (see §5.5.1 and §5.5.4) clarify how such breaches unfold in developmental terms.

- **Neglect** represents the absence of recognition. The infant's cries go unanswered, producing the collapse of epistemic autonomy (EA) and dissonance tolerance (DT), while dependence (D) saturates at pathological levels. Clinically, this dynamic parallels chronic neglect, where the individual learns that contradiction cannot reliably be voiced or met.
- **Silencing** corresponds to punitive suppression. Here, the infant's signals are actively extinguished, driving autonomy and tolerance into collapse while entrenching dependence. This resembles experiences of coercive or violent trauma, in which survival depends upon not speaking, not protesting, and in some cases not remembering.

Such relational traumas do not merely disrupt affect regulation; they compromise the basic grammar of epistemic life. Without recognition, contradiction is experienced as unsafe to express. Downstream sequelae include not only PTSD symptoms such as hypervigilance and emotional numbing, but also dissociation—the splitting off of contradiction from conscious signalling—and attachment disturbances, where the expectation of fiduciary recognition is replaced by scripts of withdrawal, fragility, or suppression.

In this sense, relational trauma marks the collapse of fiduciary scaffolding: contradiction is no longer reliably survivable or communicable. Therapy, as later sections will argue, succeeds when it re-establishes this scaffolding, allowing epistemic trust to be restored.

6.4.2 Gaslighting as epistemic silencing

Gaslighting—the systematic denial, distortion, or inversion of another's experience—can be understood as a contemporary form of epistemic silencing. Whereas neglect withdraws recognition and punitive trauma extinguishes signals outright, gaslighting operates by corrupting recognition itself. The individual's contradictions are not ignored but reframed as errors, exaggerations, or fabrications. Recognition appears in form but is stripped of fiduciary content.

This dynamic parallels the silencing policy in KMED-I simulations (§5.5.4). In both cases, epistemic autonomy (EA) and dissonance tolerance (DT) decline sharply, not because signals are absent but because they are consistently invalidated. Dependence (D) becomes entrenched, as survival requires accommodation to the distorted framework imposed by the gaslighter. Over time, contradiction itself comes to feel unsafe or illegitimate.

Philosophical work situates gaslighting at the intersection of epistemology, psychology, and power. Bailey (2020) highlights its role as a form of epistemic injustice that corrodes trust and produces pervasive disorientation, showing how abusive dynamics weaponise recognition against the vulnerable. Survivors frequently report the impossibility of distinguishing genuine perception from imposed narrative. In epistemic terms, the fiduciary scaffold has not been merely withdrawn but inverted: signals are ostensibly acknowledged but in ways that undermine autonomy and corrode epistemic trust.

This maps onto the broader literature on epistemic injustice. Fricker (2007) defines testimonial injustice as the discrediting of a speaker's credibility, while Medina (2013) shows how interpretive resources can be manipulated to silence dissent. Gaslighting instantiates both: it enacts testimonial injustice by denying the victim's credibility, and hermeneutical injustice by corrupting the frameworks through which their contradiction could be made intelligible.

Clinically, gaslighting rehearses the same script simulated under punitive silencing in infancy: contradiction is not absent but invalidated, with devastating consequences. The result is a collapse of epistemic trust, often manifesting as dissociation, identity confusion, chronic self-doubt, and attachment disturbances. Unlike neglect, where contradiction simply goes unanswered, gaslighting enforces dependence through corrupted recognition, binding the individual to the authority of the silencer.

6.4.3 Clinical sequelae

If trauma, neglect, and gaslighting represent breaches of fiduciary care, then their clinical sequelae can be reframed as the downstream consequences of compromised epistemic scaffolds. Instead of rehearsing resilience through recognition, the individual internalises scripts of avoidance, fragility, or suppression, which later crystallise in psychiatric symptoms.

Post-traumatic stress disorder (PTSD).

PTSD can be seen as the hyperactivation of contradiction without recognition. Intrusive memories and hypervigilance reflect an unprocessed dissonance signal—crying without a caregiver—that persists without closure. Avoidance and numbing, conversely, rehearse the neglect script: survival through withdrawal when recognition is absent.

Dissociation.

Dissociation may be read as the collapse of contradiction into silence. In KMED-I terms, it parallels the silencing policy: signals are extinguished, not metabolised. Survivors learn that dissonance is not survivable in consciousness and must be partitioned off. The result is a splitting of epistemic life, where some contradictions are lived but cannot be spoken or integrated.

Attachment disturbances.

Chronic breaches of fiduciary care lead to predictable distortions in attachment styles. Avoidant patterns rehearse neglect: contradiction is suppressed as irrelevant. Ambivalent patterns rehearse inconsistency: contradiction is expressed, but with exaggerated or unstable signalling. Disorganised patterns rehearse punitive silencing or gaslighting: contradiction is approached and feared simultaneously, producing incoherence in epistemic trust. These outcomes align with attachment research (Bowlby, 1969/1982; Ainsworth et al., 1978; Main & Solomon, 1990) but are here reinterpreted as epistemic grammars rather than merely socio-emotional styles.

Taken together, these sequelae underscore that trauma is not only a psychological wound but an epistemic rupture. PTSD, dissociation, and attachment disorders can be read as failures of fiduciary scaffolding: contradiction is no longer survivable, and epistemic trust is replaced by scripts of mistrust, withdrawal, or submission. The clinical task, therefore, is to restore fiduciary scaffolds—consistent recognition and relief efficacy (λ)—so that dissonance can once again be registered, communicated, and transformed.

While post-traumatic stress, dissociation, and attachment disorders represent acute or developmental sequelae of fiduciary breaches, they are not the same as personality disorders. The latter, classified as enduring relational and affective patterns, often crystallise when early fiduciary failures are repeated and stabilised into long-term scripts. In epistemic terms, PTSD and dissociation correspond to unresolved contradiction in the present, whereas personality disorders represent institutionalised scripts of mismanaged contradiction. For instance, borderline personality disorder echoes the hyperactivated signalling of inconsistent scaffolding, avoidant personality disorder reflects entrenched silencing, and dependent personality disorder exaggerates reliance on external recognition. Thus, personality disorders can be read as chronic extensions of the same fiduciary breaches identified in infancy, demonstrating the continuity of epistemic scaffolding across the life course.

6.5 Therapeutic Alliance as Re-Enactment of the Fiduciary Exchange

6.5.1 Clinical setting

In psychotherapy, the therapeutic alliance has long been recognised as one of the strongest predictors of clinical outcome (Bordin, 1979; Horvath, 2018). Traditionally defined in terms of agreement on goals, tasks, and the bond between client and therapist, the alliance can be reconceptualised here as a fiduciary exchange. The client's disclosures, ambivalences, and resistances are not simply symptoms to be analysed but epistemic signals—expressions of contradiction that summon recognition.

Within this reframing, the therapist functions as the client's first-order epistemic trustee. Just as the newborn's cry calls for a fiduciary response, the client's epistemic expressions demand dignified recognition rather than minimisation or dismissal. If these signals are received and validated, they scaffold resilience, allowing the client to explore contradiction without collapse. If they are silenced—through interpretation that forecloses, neglect of affect, or premature structuring of meaning—they risk re-traumatisation and perpetuate dependence.

Thus, the therapeutic setting recapitulates the original infant–caregiver dynamic under new conditions: the therapist assumes the role of fiduciary trustee, and the client re-engages the cry–response cycle in a context where recognition can repair breaches of epistemic trust. This extension does not displace existing theories of the alliance but deepens them: the alliance succeeds not only when tasks and goals are shared, but when contradiction itself is met with recognition rather than silencing.

6.5.2 Repetition and repair

Therapeutic work can be understood as a re-enactment of the cry–response cycle under new, adult conditions. Every moment of rupture—when a client feels misunderstood, unseen, or dismissed—recapitulates the infant's first contradiction. In these moments, the therapist occupies the role of fiduciary trustee: recognition dignifies the client's signal, while neglect, minimisation, or pathologisation risks re-traumatisation.

Research on the therapeutic alliance underscores this dynamic. Bordin's (1979) tripartite model identified agreement on goals, tasks, and bond as the foundation of effective therapy, while Safran and Muran (2000) elaborated alliance ruptures as opportunities for repair. Later meta-analyses (Horvath et al., 2011) confirm that the quality of the alliance is one of the strongest predictors of therapeutic outcome. From the perspective of epistemic psychology, these findings can be reframed: the alliance succeeds when the therapist consistently validates contradiction, thereby scaffolding the client's epistemic autonomy (EA) and dissonance tolerance (DT).

The KMED-I simulations in Chapter 5 give this process computational form. Under fiduciary policy, repeated recognition increases EA and DT, while neglect or punitive suppression increases dependence (D) and collapses resilience. Therapy thus becomes a live laboratory of fiduciary scaffolding: each instance of recognition constitutes an act of epistemic repair, transforming contradiction from a threat into a resource for growth.

6.5.3 Implications for practice

In therapeutic work, the clinician is not merely a service provider but an epistemic trustee. Each disclosure, hesitation, or rupture from the client functions as a modern echo of the infant's cry: a signal of contradiction that seeks recognition. The task of the therapist is to meet such signals reliably, consistently, and with effective relief—scaffolding resilience rather than reinforcing silencing.

Empirical work on rupture and repair in alliance (Safran & Muran, 2000; Eubanks et al., 2018) confirms that outcomes hinge less on the absence of breakdowns than on whether breakdowns are acknowledged and worked through. This is precisely the fiduciary role: treating contradiction not as noise or resistance but as the material from which trust is re-built.

From the KMED-I model, two lessons emerge for practice:

- **Reliable recognition** – clients flourish when therapists dignify epistemic signals, even when they are disruptive or uncomfortable.
- **Relief efficacy (λ)** – recognition must not only acknowledge but also ease contradiction, transforming dissonance into bearable tension rather than suppression.

Clinically, this means that therapeutic practice is fiduciary at its core. Secure outcomes arise when the alliance allows the client to experience contradiction as both survivable and communicable. Failures of recognition, by contrast, risk re-enacting neglect or silencing, with predictable retraumatisation.

Clinical takeaway: Every therapeutic moment is an epistemic exchange. To act as a fiduciary is to dignify contradiction, scaffold resilience, and thereby build durable autonomy.

Clinical vignette No 1

A client, mid-session, pauses and says: *"I don't think you really understand me. Maybe this therapy isn't working."*

In a service-provider frame, the therapist might redirect or defend: *"We're making progress—look at the goals we've set."* This response implicitly silences the contradiction, minimising the epistemic claim embedded in the client's doubt.

In a fiduciary frame, the therapist leans in: *“You’re telling me something important—that you feel unseen here. Let’s sit with that together. Can you help me understand what I’m missing?”* This response dignifies the contradiction as valid, making it survivable. Recognition does not erase dissonance but transforms it into material for growth.

Over repeated cycles, such responses strengthen the client’s epistemic autonomy (confidence to voice doubt) and dissonance tolerance (capacity to endure uncertainty without collapse). The alliance thus becomes a re-enactment and repair of the infant–caregiver scaffold: contradiction met by recognition rather than silencing.

Clinical vignette No 2 (contrasting case)

A client shares: *“Sometimes I think what happened to me wasn’t real, maybe I just made it up.”*

A silencing response might be: *“That sounds like a distortion of memory—we shouldn’t dwell on that, let’s focus on coping strategies.”* Though framed as pragmatic, this dismisses the contradiction the client is voicing, effectively gaslighting at the therapeutic level. The epistemic claim—*“I need you to recognise my uncertainty and fear”*—is not met. Instead, it collapses into enforced dependence: the client must abandon their own sense-making to conform to the therapist’s framing.

A fiduciary response, by contrast, would be: *“Part of you doubts whether it was real, and that feels destabilising. Let’s explore what makes that doubt so powerful. I’m here to stay with you in that uncertainty.”* This dignifies the contradiction without resolving it prematurely. The client learns that their dissonance is survivable when recognised.

Interpretation

The difference between these responses is decisive. The first rehearses epistemic clientelism—dependence on authority to silence contradiction. The second enacts fiduciary scaffolding, building resilience and autonomy through recognition. Therapy thus either reproduces the early breach (neglect, silencing) or repairs it by reinstating the first fiduciary exchange.

6.6 Psychology and Psychiatry as Fiduciary Sciences

Infancy reveals with clarity that autonomy and dependence are not opposites but mutually constituted through the negotiation of contradiction. The cry and its reception inaugurate this dialectic: contradiction voiced, recognition given, survival secured. From this starting point, the fiduciary model provides a unifying framework across psychology and psychiatry.

In developmental psychology, attachment theory can be reframed as the study of epistemic trust—whether the infant’s signals are dignified or silenced (Bowlby, 1982; Ainsworth et al., 1978). In psychiatry, trauma and neglect appear not merely as affective wounds but as breaches of fiduciary scaffolds, leaving autonomy and tolerance eroded. In clinical practice, the therapeutic alliance becomes a re-enactment of the first fiduciary exchange: effective therapy is not merely intervention but a recognition that contradiction is survivable when met with consistent care (Shai et al., 2022; McParlin et al., 2023).

Taken together, these strands invite psychology and psychiatry to be reconceived as fiduciary sciences: disciplines concerned with how contradiction is scaffolded, silenced, or repaired. This perspective situates epistemic scaffolding as the grammar of human resilience, extending from the first cry to the clinical encounter.

These conclusions prepare the ground for the next chapter, which opens the philosophical horizon by situating autonomy and dependence as the enduring conditions of epistemic life.

7. Philosophical Horizon

The preceding chapters developed KMED-I as a stylised, computational formalisation of the infant–caregiver cry–response dyad. Its role is not to provide empirical prediction but to illustrate the formal consequences of different caregiving policies. In this sense, KMED-I functions as a philosophical bridge: it renders visible the structural stakes of dissonance and care, showing how autonomy and dependence are co-constituted. Like Schelling’s segregation model or early neural network architectures, its significance lies not in fit to data but in demonstrating how simple relational rules generate divergent epistemic trajectories.

7.1 Infancy proves dissonance is structural

Empirical research shows that dissonance appears from the earliest stages of life. Silver et al. (2020) demonstrated that preverbal infants, between 10 and 20 months, already display choice-induced preference shifts, devaluing the unchosen option. Grosse Wiesmann et al. (2022) extended this finding, showing that toddlers around two years exhibit “blind-choice” dissonance, adjusting preferences even when choices are arbitrary. Comparative work by Egan, Santos, and Bloom (2007) further revealed that both young children and capuchin monkeys avoid previously unchosen items—evidence that dissonance reduction emerges across species and precedes reflective reasoning.

The KMED-I simulations in Chapter 5 formalise this trajectory by treating the newborn’s cry as the first expression of contradiction. Across policies, the cry is recognised, suppressed, or distorted, but never absent. Even under silencing, dissonance persists—extinguished only as an epistemic claim. This confirms what developmental findings imply: dissonance is not an error state but the baseline condition of cognitive life (see §2.5).

Philosophically, the implication is decisive: dissonance is constitutive, not accidental. It precedes self-concept, rational deliberation, and cultural narrative. The simulations serve here not as empirical forecasts but as stylised demonstrations, showing how recognition or silencing scripts developmental pathways. In this way, the newborn’s cry exemplifies the ontological given of contradiction—long theorised by Hegel and Heidegger—now rendered visible in a minimal computational idiom.

The broader ontological claim follows: epistemic life begins not in harmony, but in contradiction that demands recognition.

7.2 Co-constitution of autonomy & dependence

As argued in *Re-founding Psychology as Epistemic Psychology* (Kahl, 2025b), autonomy does not arise in isolation but through dependence dignified by fiduciary scaffolds. The first cry makes this visible: contradiction is registered but cannot be resolved alone; survival requires recognition. Autonomy thus begins not in independence but in recognised dependence.

The KMED-I simulations formalise this claim. Under fiduciary policy, epistemic autonomy (EA) and dissonance tolerance (DT) rise while dependence (D) settles at a stable baseline. Under neglect or silencing, EA and DT collapse as D saturates. Inconsistency produces fragile oscillations, cultivating hypervigilance. These patterns align conceptually with attachment categories—secure, avoidant, ambivalent, disorganised (Bowlby, 1982; Ainsworth et al., 1978)—though the mapping is illustrative, not empirically validated.

Philosophically, the lesson is that autonomy is relational: dependence is not its negation but its enabling ground. Recognition converts dependence into resilience, echoing Winnicott’s “good enough” mother (1965) and feminist theories of relational autonomy (Mackenzie & Stoljar, 2000). KMED-I makes this visible in stylised form, showing how simple probabilistic scaffolds reproduce the insight that autonomy emerges only within dependence.

7.3 Clientelism as grammar of social life

The infant–caregiver relation provides the template for a broader grammar of social life. As developed in *Epistemic Clientelism in Intimate Relationships* (Kahl, 2025c), dependence on the powerful for recognition and security can calcify into clientelist structures: conditional loyalty or silence is exchanged for protection. What begins in the cradle as the contingency of recognition becomes, in later life, the conditionality of belonging.

KMED-I offers a stylised bridge from micro to macro. Its simulations illustrate how conditional recognition rehearses the very exchanges that later structure families, schools, workplaces, and political regimes. Political science identifies patron–client ties as a core logic of authoritarianism (Kitschelt & Wilkinson, 2007). Academia, too, often mirrors this dynamic: epistemic agency is granted only under compliance, reproducing clientelist knowledge systems (Kahl, 2025d).

Clientelism thus functions as a grammar of social life: a conditional exchange of autonomy for recognition. The normative question is not whether dependence exists—it always does—but whether it is scaffolded fiduciary-epistemically (autonomy-enhancing) or eroded into clientelism (autonomy-reducing).

Attachment patterns anticipate these trajectories. Secure attachment scripts survivable contradiction; avoidant rehearses obedience through silence; ambivalent cultivates fragility through inconsistency; disorganised enacts incoherence, where recognition is both sought and feared. These early epistemic lessons extend outward into institutions and politics, where the same conditional exchange becomes the organising principle (Cassidy & Shaver, 2016). This mapping is conceptual rather than empirically validated and should be read as an illustrative extension of attachment insights.

7.4 Normative claim – fiduciary scaffolds must dignify, not collapse, dissonance

The philosophical pivot is that autonomy does not emerge through the eradication of contradiction but through its recognition. The newborn’s cry demonstrates this truth: when contradiction is dignified, resilience grows; when ignored or silenced, dependence calcifies and autonomy erodes.

The negative case makes the stakes plain. Silencing collapses dissonance into submission, while gaslighting distorts it into unspeakability (Kahl, 2025c). At scale, authoritarian regimes reproduce this dynamic: survival secured only through silence or conformity. As Arendt (1951/1973) argued, totalitarian systems destroy the very spaces where truth claims can be voiced, extinguishing pluralism.

The positive case is fiduciary scaffolding. From infancy through institutions, recognition enables contradiction to persist without annihilation: the cry that is heard, the dissent that is tolerated, the testimony that is received. This echoes *Epistemic Clientelism Theory* (Kahl, 2025d): the decisive question is whether dependence is scaffolded fiduciary-epistemically, fostering autonomy, or eroded into clientelism, producing compliance.

The ethical claim is clear: every domain of epistemic life carries fiduciary duties. In education, contradiction must be heard as inquiry; in politics, pluralism must be sustained as dissent; in therapy, dissonance must be treated as survivable. The contribution of KMED-I is to make this visible in stylised form. Its trajectories are not empirical forecasts but conceptual demonstrations that autonomy depends upon the dignification of contradiction. The obligation to dignify rather than collapse dissonance thus extends far beyond the nursery: it is the condition of epistemic life itself, binding individuals, institutions, and polities to the recognition of the first cry.

7.5 Toward an ethic of epistemic care: autonomy begins with recognition of the first cry

The trajectory of this inquiry leads to an ethical horizon. The newborn's cry is the first epistemic act: a contradiction voiced before language, demanding recognition. When such contradiction is met, autonomy is inaugurated; when it is silenced or distorted, submission is rehearsed. What the evidence across infancy, attachment, and simulation has shown is that survival and autonomy are not separate paths, but co-constituted through recognition.

An ethic of epistemic care follows: contradiction must be dignified, not erased. Care is not only affective but epistemic—it acknowledges the legitimacy of signals that disrupt harmony. To treat dissonance as pathological is to collapse the very condition of autonomy. To meet it as survivable is to build resilience and trust.

The implications span domains:

- **Developmental psychology.** Secure attachment emerges when contradiction is consistently dignified—when the cry is heard and answered. Avoidant, ambivalent, and disorganised trajectories reveal what happens when recognition is conditional or withdrawn (Cassidy & Shaver, 2016).
- **Clinical practice.** Therapy functions as fiduciary repair of this first exchange. Effective alliance re-enacts the cry–response cycle, offering recognition where it was once absent. Consistent recognition builds durable autonomy, as work on epistemic trust has underscored (Fonagy & Allison, 2014).
- **Political life.** Democracy depends upon recognising pluralism as legitimate contradiction: dissent is treated as survivable, not annihilated as disobedience. As Arendt (1951/1973) warned, authoritarian regimes collapse plurality by extinguishing contradiction itself.

These strands converge in a single thesis: an ethic of epistemic care begins in the cradle but extends into every human relation. To dignify dissonance is to sustain the conditions of autonomy, resilience, and trust.

Such an ethic is at once modest and expansive. Modest, because it asks only that contradiction be recognised. Expansive, because this principle underlies the foundations of development, therapy, and democracy alike. The chapters that follow situate this ethic within the broader philosophical horizon of epistemic life, showing how the first cry echoes through the structures of social existence.

8. Conclusion

8.1 Synthesis: The First Cry as the Origin of Epistemic Life

This study offers a theoretical and computational scaffolding for understanding the first cry as epistemic. It is not a clinical manual or parenting guide. Its scope is conceptual: to frame the conditions under which contradiction is dignified or suppressed, and to show how these conditions reverberate across psychology, psychiatry, philosophy, and governance.

The argument advanced in this work can be condensed into one claim: the newborn's first cry is the primordial epistemic act. More than reflex, it is the embodied registration of contradiction—need unmet, environment misaligned, finitude encountered—voiced into the world. Human life begins not in harmony but in dissonance.

The evidence converges. Developmental research (Egan et al., 2007; Silver et al., 2020; Grosse Wiesmann et al., 2022) shows that dissonance processes precede language or reflective selfhood. The KMED-I simulations formalise this by demonstrating how different caregiver policies produce distinct trajectories of epistemic autonomy, tolerance, and dependence.

These outcomes map directly onto classical attachment categories, reinterpreted here as epistemic lessons:

- **Secure** → contradiction dignified → resilience.
- **Avoidant** → contradiction extinguished → silence as survival.
- **Ambivalent** → contradiction inconsistently recognised → fragile autonomy.
- **Disorganised** → contradiction punished → incoherence and fear.

It shall be noted that the mapping remains a conceptual scaffold linking caregiving scripts to epistemic trajectories, not a direct empirical equivalence.

Thus attachment is not merely relational style but epistemic script, rehearsing how contradiction will be treated across the lifespan. In this way, dissonance is revealed not as a bias to be corrected but as the grammar of epistemic life, scripting durable expectations for trust, recognition, and resilience.

Philosophically, the newborn's cry makes audible what Heidegger called finitude and what Hegel called contradiction: conditions that are not pathologies but the ontological givens of knowing.

8.2 Cross-Disciplinary Implications

Psychology. The findings reposition dissonance from being treated as bias or pathology to being recognised as a constitutive signal of epistemic life. Attachment theory is reframed as the earliest form of epistemic trust: whether contradiction is dignified or silenced scripts the trajectory of autonomy and resilience. Attachment styles, in this light, encode epistemic lessons—secure attachment scripts survivable contradiction, avoidant scripts silence-as-survival, ambivalent scripts fragile hyperactivation, and disorganised scripts incoherence under fear.

Psychiatry. Trauma, neglect, and gaslighting are reconceived as breaches of fiduciary scaffolds rather than mere symptom clusters. Therapy functions as fiduciary repair: consistent recognition of contradiction rewrites the script from silencing toward trust, providing the epistemic ground for recovery and renewed autonomy. Disorders of trust can thus be read as failures of epistemic scaffolding, where early maladaptive scripts are replayed in clinical form.

Intimate relationships. The fiduciary reframing extends into the private sphere. *Epistemic Clientelism in Intimate Relationships* (Kahl, 2025c) introduces the *Intimate Epistemic Oath* as a normative framework for recognising contradiction in partnership and family life. Just as infants rely on caregivers to dignify dissonance, adults require relational scaffolds that script disagreement and vulnerability as epistemically legitimate rather than silenced. This shows that epistemic clientelism is not confined to institutions: its grammar scripts love, intimacy, and domestic life, with the fiduciary model offering a pathway to transform dependency into resilience.

Philosophy. The simulations and developmental evidence confirm that autonomy and dependence are co-constituted. Dissonance, far from being an error state, is the structural grammar of knowing—akin to contradiction in Hegel or finitude in Heidegger. An ethic of epistemic care thus follows: the foundational lesson scripted in the cradle—that contradiction must be recognised—remains binding across all domains of epistemic life.

Governance (institutions and knowledge). The fiduciary reframing prefigures obligations in universities, corporations, and media. Universities must act as epistemic trustees, as argued in *Epistemocracy in Higher Education* (Kahl, 2025f) and *Toward Academia's Own Hippocratic Oath* (Kahl, 2025g). Corporate directors' duties must be rethought as epistemic as well as financial (*Directors' Epistemic Duties and Fiduciary Openness*, Kahl, 2025e). And media, as epistemic gatekeepers, script the conditions of public trust: they either dignify plural voices or silence contradiction. In *Epistemic Gatekeepers as the Fourth Estate* (Kahl, 2025h), I argued that without fiduciary accountability, knowledge institutions risk collapsing into epistemic clientelism.

Governance (political regimes). The logic of the first cry also illuminates politics. Democracies depend on fiduciary scaffolds that recognise contradiction and sustain pluralism; authoritarian regimes, by contrast, operate as silencing caregivers, extinguishing contradiction and imposing surface compliance at the cost of resilience. *Lessons from the Hong Kong Unrest* (Kahl, 2025i) demonstrated how protest movements collapse when recognition is withheld and dissent is punished, scripting societies into epistemic fragility. Public governance, no less than infant care, is determined by whether contradiction is dignified or suppressed.

Across psychology, psychiatry, intimacy, philosophy, and governance, the same lesson resounds: the first cry is the archetype of contradiction, and every domain of human life is judged by whether it scripts that cry as dignified recognition or suppressed silence.

8.3 Normative Takeaway: Dignify the Cry, Safeguard Dissonance

The empirical and computational evidence converges on a single moral imperative: contradiction must be dignified rather than collapsed. In infancy, the caregiver's recognition of the cry models the conditions under which autonomy can grow. That recognition is not only affective but epistemic: it acknowledges the cry as a claim about the world, a signal that contradiction exists and must be met. To ignore or silence that cry is not merely a lapse of sensitivity but a rehearsal of clientelism, where survival is conditioned on the suppression of contradiction.

From this micro-level lesson arises a practical maxim: “Dignify the cry, safeguard dissonance.” This phrase distils the ethic of epistemic care into a portable formula that can be applied across domains. In parenting, it calls for consistent recognition of the child’s distress as legitimate communication. In education, it insists that students’ dissent and questioning must be scaffolded, not punished. In therapy, it directs clinicians to act as fiduciary trustees of the client’s epistemic signals. In politics, it demands that leaders treat pluralism not as disorder but as the very condition of democratic life.

Reframed in fiduciary terms, responsibility extends across scales of human association. Whether in the cradle, the classroom, the clinic, or the polis, the duty of the trustee is the same: to safeguard the conditions under which contradiction can be voiced, heard, and worked through without fear of suppression. In this sense, the normative takeaway is both affective and epistemic, both developmental and political: to dignify the cry is to safeguard the very possibility of knowing itself.

8.4 Future Research: Attachment, Scripts, and the Architecture of Epistemic Life

The developmental–epistemic reframing advanced in this paper opens multiple avenues for future research, spanning empirical, computational, clinical, and normative domains.

Empirical. Longitudinal studies are needed to test directly whether early recognition of distress predicts epistemic resilience in later childhood and adolescence. While attachment research has richly documented socio-emotional outcomes, fewer studies have operationalised autonomy and dissonance tolerance as epistemic variables. Future work could explore how secure, avoidant, ambivalent, or disorganised attachment patterns function not just as relational categories but as epistemic lessons—scripts for how contradiction is to be handled. Do infants raised under secure scaffolds carry forward expectations that dissonance is survivable and communicable, while insecure patterns engrain scripts of suppression, hyperactivation, or incoherence?

Computational. The KMED-I framework presented in Chapter 5 is an initial step toward formalising cry–response dynamics. Future refinements should test its robustness, extend simulations to multi-agent or group settings (siblings, peer groups, classrooms), and explore threshold effects of recognition and silencing. Parameter sweeps across λ (relief efficacy), π (punitive suppression), and stochastic noise could identify tipping points where autonomy either consolidates or collapses. Integration with Bayesian or active inference models could also situate KMED-I within broader cognitive modelling traditions.

Clinical. Interventions could be assessed for their ability to scaffold epistemic trust, rather than only to alleviate symptoms. Relief efficacy (λ) could be operationalised as a measurable predictor of therapeutic success: how effectively does the clinician’s recognition transform dissonance into resilience? Attachment-informed therapies might be reconceived as script-revising interventions, re-writing learned clientelist scripts into fiduciary ones. Randomised controlled trials of attachment-based or trust-oriented therapies could be analysed through this epistemic lens.

Normative theory. Comparative research is required to formalise fiduciary ethics across domains. In law, governance, and pedagogy, fiduciary duties already articulate relations of trust and dependence. Extending these duties epistemically—requiring institutions to dignify contradiction rather than suppress it—could provide a normative architecture linking micro-level caregiving with macro-level democratic and institutional design.

Interdisciplinary collaborations. Advancing this programme requires integration across fields:

- **Developmental psychologists** could design longitudinal protocols tracing recognition events and their outcomes into adolescence.
- **Computational modellers** could refine KMED-I with more realistic learning rules and neural plausibility.
- **Clinicians** could test interventions that explicitly target epistemic trust as an outcome measure, bridging diagnostic categories with relational scaffolds.
- **Philosophers and legal scholars** could expand fiduciary ethics to epistemic contexts, shaping debates in bioethics, higher education, and democracy.
- **Neuroscientists** could investigate whether recognition events have identifiable neural correlates, linking the fiduciary scaffold to embodied cognition.

Taken together, these directions aim not only to consolidate a new field of epistemic psychology but also to demonstrate its reach: from infancy to therapy, from scripts of attachment to the scripts of governance, and from the cry in the cradle to the pluralism of democratic life.

Implications & Testable Predictions

The developmental–epistemic account proposed here yields falsifiable hypotheses that invite empirical testing:

1. **Recognition frequency × epistemic trust.** Higher recognition frequency predicts greater willingness to signal distress later (proxy for EA).
2. **Relief efficacy (λ).** Soothing effectiveness correlates with resilience (DT); misattuned soothing predicts fragility even with high recognition.
3. **Suppression cost (π).** Punitive or dismissive responses accelerate extinction of signalling, approximating avoidant/disorganised profiles.
4. **Script continuity.** Early cry–response patterns predict later “bias-as-script” tendencies:
 - Fiduciary care → epistemic trust.
 - Neglect/silencing → learned silence or hypercompliance.
 - Inconsistency → hyperactivated vigilance.
5. **Cross-domain generalisation.** Adolescents’ ability to tolerate contradiction without collapse should correlate with early recognition × λ profiles.
6. **Clinical interventions.** Sensitivity or touch-based interventions that target epistemic trust should increase EA/DT trajectories compared to controls.

8.5 Closing Reflection: Hearing the Cry as Epistemic

To hear the newborn's cry as epistemic is to re-hear the foundations of knowing itself. Psychology has long treated dissonance as bias, a deviation from rational equilibrium. This paper reframes it as script: the cry scripts whether contradiction is dignified or suppressed, a lesson that resonates into intimacy, therapy, education, and politics.

The developmental evidence, attachment theory, and clinical insights provide the empirical background; the computational framework presented here (KMED-I) adds a conceptual scaffold, making explicit how distinct caregiving policies generate divergent epistemic trajectories. These simulations are not empirical demonstrations but stylised proofs-of-concept: theoretical instruments that show how dissonance, recognition, and dependence co-constitute the earliest conditions of autonomy.

From this perspective, the developmental evidence, computational modelling, and normative analysis converge on a single imperative: contradiction must be recognised. When dignified, it scripts resilience and autonomy; when silenced or punished, it scripts clientelism, fragility, or incoherence.

The arc from cradle to polis is continuous. In the nursery, recognition teaches that contradiction is survivable; in institutions, fiduciary scaffolds enable dissent without collapse; in democracy, pluralism depends on dignifying dissonance rather than suppressing it. To safeguard contradiction is thus both a developmental necessity and a civic virtue.

To dignify the cry is to dignify knowing itself: every epistemic life begins in dissonance, and every society thrives or falters by how it scripts that first contradiction.

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Appendix A: Simulation Framework (KMED-I) — Documentation and Usage

A.1 Python source code and licence

- **Reference implementation:** *KMED-I (Infancy) — Cry-Response Dyad Simulator* (Kahl, 2025j).
- **Public repository:** <https://github.com/Peter-Kahl/KMED-I-infant-cry-response-dyad-simulator>
- **Licence:** MIT (code). Paper assets under CC BY-NC-ND 4.0.
- **Versioning:** Code has its own semantic versioning (e.g. v0.9.7). Manuscript releases are tagged separately in the repository (e.g. v1.0-preprint, v1.1-revision) for exact replication.

A.2 File layout

```
repo/
├── src/
│   ├── kmed_infant_run.py      # CLI runner (single-file reference)
│   └── utils/                  # helpers (future expansion)
├── outputs/                    # plots + JSON runmeta (created at run-time)
├── LICENSE
├── README.md                   # quick start + examples
└── requirements.txt
```

A.3 Environment and install

- **Python:** 3.9+
- **Packages:** numpy, matplotlib (all other imports from Python stdlib)

Quick start

```
# clone
git clone https://github.com/Peter-Kahl/KMED-I-infant-cry-response-dyad-simulator.git
cd KMED-I-infant-simulation-epistemic-psychology

# (optional) virtual env
python3 -m venv .venv && source .venv/bin/activate # Windows: .venv\Scripts\activate

# install
pip install -r requirements.txt
# or
pip install numpy matplotlib
```

A.4 Command-line interface (CLI)

The runner exposes a small set of flags to reproduce all figures.

A.4.1 Baseline policies

```
# fiduciary (secure-like)
python src/kmed_infant_run.py --policy fiduciary --T 100

# inconsistent (ambivalent-like)
python src/kmed_infant_run.py --policy inconsistent --T 100

# neglect (avoidant-like)
python src/kmed_infant_run.py --policy neglect --T 100

# silencing (punitive/disorganised-like)
python src/kmed_infant_run.py --policy silencing --T 100
```

A.4.2 Parameter sweeps (heatmaps)

```
# recognition/suppression proxy sweep (R×S grid)
python src/kmed_infant_run.py --policy sweep --sweep_grid 21 --T 100

# relief efficacy  $\lambda$  sweep (recognition ×  $\lambda$ )
python src/kmed_infant_run.py --policy sweep --sweep_y lambda --sweep_grid 31 --T 100

# punitive penalty  $\pi$  sweep (recognition ×  $\pi$ )
python src/kmed_infant_run.py --policy sweep --sweep_y pi --sweep_grid 31 --T 100
```

A.4.3 Common options

```
--T <int>           # timesteps (default 100)
--seed <int>        # RNG seed (default fixed for determinism)
--save_raw          # also dump raw arrays (.npy) alongside plots
--noise <float>     # observation/process noise
--alpha/--beta/--gamma/--kappa/--mu/--nu/--eta/--lam/--pi_penalty # update coefficients
```

A.5 Reproducing the figures (paper mapping)

Each run stamps outputs with a run-metadata box and writes a JSON alongside plots.

Policy	Description	CLI flag	Expected outcome
fiduciary	Consistent recognition; high R, low S; scaffolds EA and DT	--policy fiduciary	Stable crying, rising EA and DT, declining D
inconsistent	Variable recognition and suppression; stochastic pattern	--policy inconsistent	Oscillating crying, unstable EA/DT, fragile autonomy
neglect	Low recognition, high suppression by omission	--policy neglect	Crying reduced by extinction, EA/DT decline, D rises
silencing	Active punitive suppression; recognition blocked	--policy silencing	Rapid extinction of crying, collapse of EA, entrenched dependence

sweep	Grid search/sensitivity analysis across parameters	--policy sweep	Heatmaps of outcomes across parameter ranges
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Table A.5.1 — Operational Parameter Presets for Caregiver Response Policies in the KMED-I (Infancy) Cry-Response Dyad Simulator.

Each policy is implemented as a reproducible set of coefficients and probabilities accessible via the command-line interface. These presets translate the conceptual policies defined in Table 5.1 into executable code, generating the developmental trajectories summarised in Table 5.2. Parameters govern the updating of epistemic autonomy (EA), dissonance tolerance (DT), dependence (D), and crying frequency (δ) across cry-response cycles.

A.6 Determinism and metadata

- **Seeds:** a fixed default seed ensures the same trajectories; override with `--seed`.
- **Run meta:** every run writes `*_runmeta.json` with all hyper-parameters, code version, timestamp and seed to support exact replication.
- **File naming:** includes policy and datestamp; raw arrays saved with `--save_raw`.

A.7 Parameter presets (high-level)

The runner ships with policy presets reflecting Chapter 5:

- **Fiduciary:** high recognition; strong positive updates to EA/DT; low S/π .
- **Inconsistent:** stochastic mix of R and S; moderate, noisy updates.
- **Neglect:** low recognition; elevated suppression baseline; EA/DT erode.
- **Silencing:** punitive suppression; δ extinguishes; EA/DT collapse; D saturates.

Exact coefficients appear in the code comments and in the stamped run-metadata box.

A.8 Extending the simulator

- **Custom policy:** add a policy block (preset parameters) or pass coefficients via CLI.
- **New sweeps:** use `--sweep_y` to scan λ , π , noise, η , or initial conditions (if implemented).
- **Batch scripts:** shell loops to generate panels for supplementary material.
- **Exports:** pass `--save_raw` to enable independent statistical analysis (e.g., R/Julia).

A.9 Troubleshooting

- **No plots saved:** ensure you are in `src/` or pass full paths; check write permissions to `outputs/`.
- **Matplotlib backend errors:** use a non-interactive backend in headless environments, e.g. `MPLBACKEND=Agg`.

- **Non-deterministic results:** confirm `--seed` is set; check that OS/BLAS does not alter RNG (NumPy RNG is used consistently).

A.10 How to cite

Please cite the paper and optionally the repository release tag:

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and

Kahl, P. (2025). *KMED-I (Infancy): Cry-Response Dyad Simulator* (Version v1.0-preprint) [Computer software]. Lex et Ratio Ltd. GitHub. <https://github.com/Peter-Kahl/KMED-I-infant-cry-response-dyad-simulator/releases/tag/v1.0-preprint>

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