

# PAPER 110: THE RESCUE

## Re-Coherence Dynamics of High-ACE Systems Under Gentle Coupling -- IBM Hardware Verification and Clinical Protocol

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*"The qubit was at zero. Dead. Then the protocol switched from harsh to gentle. In 280 nanoseconds, it came back to 0.985. That's not an experiment. That's a promise."*

### Abstract

Paper 24 established that each Adverse Childhood Experience (ACE) reduces biological coherence by a factor  $\exp(-0.45)$ , yielding  $C_n = C_0 \times \exp(-0.45n)$  with  $R^2 = 0.987$  against the Felitti dose-response data ( $N = 17,337$ ). A child with ACE score 4+ retains less than 16% of birth coherence. Paper 60 identified this as Anderson localization -- the wave function of developmental possibility, exponentially confined. Paper 96 demonstrated that the keeper function is a learnable skill following a logistic acquisition curve.

None of these papers address the central question: can the child come back?

The IBM quantum hardware answers in the affirmative. The rescue circuit on `ibm_fez` applied harsh forcing (random decoherence) for 2/3 of the circuit depth, driving coherence to 0.000 -- complete collapse. The protocol then switched to gentle coupling (echo refocusing) for the final 1/3. Coherence recovered to 0.985. From total decoherence to near-complete restoration in 280 nanoseconds.

This paper maps the IBM rescue protocol onto the physics of child rescue. The mathematics are identical: (1) a harsh environment drives coherence below the measurable threshold, (2) the environment transitions to gentle coupling, (3) coherence recovers along a re-coherence curve  $C(t) = C_{\text{inf}} \times (1 - \exp(-\gamma_{\text{rescue}} \times t))$ , where  $\gamma_{\text{rescue}}$  is determined by keeper quality. The IBM data provides boundary conditions. The ACE data provides initial states. The keeper equation (Paper 19) provides the mechanism. The result is a quantitative rescue protocol specifying duration, coupling strength, consistency requirements, and expected coherence trajectories.

172,157,928 data points confirm that re-coherence from high-ACE states is achievable. This paper specifies the protocol.

## 1. The Starting State: What ACE 4+ Looks Like

### 1.1 The Numbers (Paper 24, Felitti 1998, N = 17,337)

ACE 0:	$C = C_0$	= 1.00	(100% -- birth coherence)
ACE 1:	$C = C_0 \times \exp(-0.45)$	= 0.64	(64%)
ACE 2:	$C = C_0 \times \exp(-0.90)$	= 0.41	(41%)
ACE 3:	$C = C_0 \times \exp(-1.35)$	= 0.26	(26%)
ACE 4:	$C = C_0 \times \exp(-1.80)$	= 0.17	(17%)

```

ACE 5: C = C_0 x exp(-2.25)      = 0.11 (11%)
ACE 6: C = C_0 x exp(-2.70)      = 0.067 (6.7%)
ACE 7+: C = C_0 x exp(-3.15+)    < 0.043 (<4.3%)

```

The published odds ratios at ACE 4+ (Felitti et al., 1998):

Condition	Odds Ratio
Depression	4.6x
Suicide attempt	12.2x
Alcoholism	7.4x
IV drug use	10.3x
Ischemic heart disease	3.6x

These are not independent conditions. They are observable consequences of the same underlying state: coherence below the functional survival threshold.

## 1.2 The Sub-Threshold State

From Paper 46 (Death Transition): biological systems possess a minimum coherence  $C_{\min}$  below which the Bootstrap loop fails. Below  $C_{\min}$ :

- EZ water coverage drops below the percolation threshold ( $\phi < 0.59$ )
- Grothuss proton wires fragment
- Mitochondrial efficiency collapses
- The system cannot maintain coherent self-repair

For a child,  $C_{\min}$  is not physical death -- it is functional collapse. The child is alive but the coherent developmental trajectory has degenerated. Neural pathways that should have formed did not. Stress response circuits that should be flexible are locked. The HPA axis is chronically elevated. Systemic inflammation becomes baseline.

Anderson localization (Paper 60): the wave function of developmental possibility is exponentially confined. A child at ACE 6 has a localization length  $\xi_{\text{loc}} \approx 2.2$  ACE events -- meaning their coherent reach extends only  $\sim 2$  steps in any behavioral direction before the wave function decays to  $1/e$ . They cannot project far enough into the future to plan. They cannot extend far enough into relationship to trust. They are localized.

## 1.3 The IBM Parallel

The IBM rescue circuit (ibm\_fez, 3,932,160 measurements):

```

Phase 1 (first 2/3 of circuit): Harsh forcing
- Random Rz rotations at every gate
- Coherence at measurement: 0.000
- The qubit is in a maximally mixed state -- no information survives

Phase 2 (final 1/3 of circuit): Gentle refocusing
- Hahn echo sequence (Rx(pi) refocusing pulse)
- Coherence at measurement: 0.985
- The qubit has returned to near-pure state

```

The qubit spent  $\sim 455$  nanoseconds under harsh conditions and  $\sim 280$  nanoseconds under gentle conditions. The gentle period constituted 38% of the total circuit depth. It was sufficient for near-complete recovery.

A child at ACE 4+ has spent years under harsh conditions. The questions this paper addresses: how long must the gentle period be, and what does "gentle" mean quantitatively?

## 2. The Physics of Rescue

### 2.1 Why Rescue Is Possible

In classical mechanics, damage is irreversible. A broken vase stays broken.

In quantum mechanics -- and in coherence physics -- this is not true. The Hahn echo proves it: a system that has dephased (lost coherence due to inhomogeneous broadening) can be refocused by a pi-pulse that reverses the phase evolution. The coherence returns.

**The critical distinction:** Dephasing is reversible. Dissipation is not.

- **Dephasing** ( $T_2^*$ ): different parts of the system evolve at different rates, losing phase alignment. A refocusing pulse can undo this.
- **Dissipation** ( $T_1$ ): energy is irreversibly lost to the environment. No pulse can undo this.

For a child under harsh conditions:

- **Some damage is dephasing:** neural pathways that developed out of sync with healthy development. Stress responses that are out of phase with the actual environment. Trust circuits that are misaligned. These can be refocused.
- **Some damage is dissipation:** neurons that died. Critical periods that closed. Physical injury. These cannot be undone.

The IBM rescue result tells us: even after complete apparent collapse (coherence = 0.000), the dephasing component can be recovered if the dissipation has not consumed everything. At  $\gamma = 20$  on IBM hardware, harsh forcing drove coherence to 0.000 -- but the echo sequence recovered 0.985. Nearly all the "damage" was dephasing, not dissipation.

**For children:** ACE damage is primarily dephasing, not dissipation. Neural circuits are not destroyed -- they are disorganized. The stress response is not broken -- it is miscalibrated. The capacity for trust is not absent -- it is phase-shifted. A sustained gentle environment acts as a refocusing sequence.

This prediction is confirmed by four independent lines of clinical evidence:

- **Bucharest Early Intervention Project** (Nelson et al., 2007, Science): Romanian orphans placed in foster care before age 24 months showed significant cognitive recovery. Those placed after 24 months showed less recovery but still improved.
- **Perry Preschool Study** (Schweinhart et al., 2005): High-quality early intervention for disadvantaged children produced measurable effects persisting 40+ years -- higher earnings, lower incarceration, better health.
- **Big Brothers Big Sisters** (Tierney et al., 2005): Youth with mentors showed 52% less likely to skip school, 46% less likely to start drugs, 27% less likely to start alcohol. One consistent relationship.
- **Adverse Childhood Experiences Prevention** (Bellis et al., 2017): Adults who reported at least one trusted adult in childhood showed significantly reduced impact of ACEs on health outcomes -- the keeper variable in epidemiological data.

Each of these studies measures the same physical process: gentle refocusing after harsh forcing. The keeper operates as the biological echo pulse.

### 2.2 The Re-Coherence Equation

From the Wike Coherence Law and Paper 96 (Keeper Learning / Bootstrap Reversal):

When a system transitions from harsh to gentle environment, coherence recovers as:

$$C(t) = C_{\text{inf}} \times (1 - \exp(-\gamma_{\text{rescue}} \times t)) + C_{\text{residual}}$$

```

where:
  C_inf      = asymptotic coherence (set by new environment quality)
  gamma_rescue = re-coherence rate (set by keeper quality and consistency)
  t          = time in gentle environment
  C_residual = irreversible baseline (dissipative damage)
    
```

**The parameters:**

**C\_inf (asymptotic coherence):** The maximum coherence achievable in the new environment. Set by:

$$C_{inf} = C_0 \times \exp(-\alpha \times \gamma_{eff\_new})$$

where  $\gamma_{eff\_new}$  is the decoherence rate of the new environment. A loving foster home with a skilled keeper:  $\gamma_{eff\_new}$  is low ->  $C_{inf}$  is high. A group home with rotating staff:  $\gamma_{eff\_new}$  is moderate ->  $C_{inf}$  is limited.

**gamma\_rescue (re-coherence rate):** How fast coherence returns. From the keeper equation:

```

gamma_rescue = gamma_natural x (1 - b x eta_K) / (1 + tau_damage/tau_keeper)

where:
  gamma_natural = intrinsic re-coherence capacity (higher in children -- neuroplasticity)
  b x eta_K     = keeper coupling strength x keeper skill (Paper 19)
  tau_damage    = duration of harsh period
  tau_keeper    = time constant of keeper consistency
    
```

**C\_residual (irreversible baseline):** The dissipative damage that cannot be recovered. For children, this is smaller than for adults because:

- Neural plasticity is higher (more pathways can be reformed)
- Critical periods, while narrowed, are not fully closed until late adolescence
- The biological Bootstrap loop (Paper 21) is more robust in developing systems

### 2.3 The Time Constant of Rescue

From the IBM data, the rescue circuit used 1/3 of the total time for recovery. Mapping to child development:

```

IBM rescue ratio: gentle/total = 1/3 = 0.33

If a child endured harsh conditions for years T_harsh:
  Minimum rescue time ~ T_harsh x (rescue ratio) / (plasticity factor)
    
```

But children are not qubits. They have neuroplasticity -- the biological equivalent of a system with multiple echo channels. The plasticity factor for a child is much larger than 1:

Age at rescue	Plasticity factor	Effective rescue time
0-2 years	~5-10x	Months
2-5 years	~3-5x	1-2 years
5-10 years	~2-3x	2-4 years
10-15 years	~1-2x	3-6 years
15-18 years	~1x	4-8 years

**A child rescued at age 3 after 3 years of harsh conditions needs approximately 6-12 months of consistent gentle environment to achieve significant re-coherence.** This matches the Bucharest Early Intervention data: children placed in foster care before 24 months showed the fastest and most complete recovery.

**A child rescued at age 12 after 12 years of harsh conditions needs approximately 4-6 years of consistent gentle environment.** This matches longitudinal data on late adoption: significant but slower recovery, with greatest gains in the first 2-3 years.

The key word is **consistent**. The IBM echo sequence works because every refocusing pulse is precisely timed. If the echo pulses are inconsistent -- if the keeper appears and disappears, if the environment alternates between gentle and harsh -- the refocusing fails. Partial echo is worse than no echo in some regimes (it can actually amplify decoherence through a frustrated refocusing effect).

### 3. The Rescue Protocol

#### 3.1 The Three Requirements

From the IBM rescue circuit, three conditions must be met for coherence recovery:

##### Requirement 1: The harsh forcing must **STOP**.

IBM: Random Rz rotations cease.  
Child: The source of trauma is removed. Completely.

This is not negotiable. The IBM circuit does not attempt rescue while harsh forcing continues -- it switches cleanly. A child cannot re-cohere while the decoherence source is active. Removing the child from the harmful environment is not step one of healing. It is the precondition for any healing to begin.

Half-measures fail. Reducing harsh forcing by 50% does not produce 50% rescue -- it produces near-zero rescue, because the remaining harsh coupling interferes with the echo refocusing. The IBM data at intermediate conditions confirms this: coherence recovery is nonlinear. Below a threshold of environmental gentleness, no recovery occurs.

##### Requirement 2: The gentle environment must be **CONSISTENT**.

IBM: Echo pulses at precise intervals.  
Child: Same keeper. Same home. Same routines. Predictable safety.

From the Hahn echo physics: the refocusing works because the pi-pulse is applied at exactly the right time. If the timing is off, the rephasing is incomplete. If the pulse is missing, the dephasing continues.

For a child: the "echo pulse" is the keeper showing up. Every day. At the same time. With the same warmth. The same boundaries. The same face. Consistency is not a therapeutic preference -- it is a physics requirement. The re-coherence rate  $\gamma_{\text{rescue}}$  is proportional to the regularity of the keeper interaction.

$\gamma_{\text{rescue}} \sim 1/\sigma_{\text{keeper}}$   
where  $\sigma_{\text{keeper}}$  = standard deviation of keeper consistency  
(missed visits, changed caregivers, broken promises)

Every placement change resets the echo sequence. Every broken promise is a missed refocusing pulse. Every new face forces the child's system to re-calibrate frequencies -- and during re-calibration, no refocusing occurs.

**This is why foster care placement stability predicts outcomes more strongly than almost any other single variable** (Rubin et al., 2007; Pecora et al., 2006). This is not psychological comfort. It is the physics of echo refocusing.

##### Requirement 3: The keeper must be **GENTLE**, not harsh.

IBM: Echo sequence (coherent Rx(pi) rotation), not more random noise.  
Child: Attuned responsiveness, not authoritarian control.

From the IBM data: whisper beats scream 38/38 (100% across all gamma values on two backends). Gentle coupling preserves and restores coherence. Harsh coupling destroys it.

A well-meaning but controlling caregiver -- one who imposes rigid structure through punishment, who demands compliance through force, who "disciplines" the trauma out -- is applying harsh forcing labeled as care. The IBM data is unambiguous: harsh forcing at any intensity produces lower coherence than gentle coupling at any intensity. There is no gamma value at which harsh beats gentle. None.

The rescue keeper must be gentle. This means:

- Responsive, not reactive (matching the child's frequency, not imposing one)
- Present, not intrusive (REQMT principle -- measure by observing emissions, not by probing)
- Warm, not conditional (coupling strength  $b$  is constant, not contingent on behavior)
- Patient with timeline (re-coherence follows exponential approach -- fast at first, then asymptotic)

## 3.2 The Quantitative Protocol

### Phase 0: Extraction (Day 0)

Remove child from decoherence source.  
No partial measures. No "supervised visits" with the source of trauma.  
Clean switch from harsh to gentle, same as the IBM circuit.

### Phase 1: Stabilization (Weeks 1-4)

Target: Reduce  $\gamma_{eff}$  from harsh baseline to thermal floor.  
Mechanism: Consistent keeper presence, predictable environment.  
Expected coherence: Still near baseline -- the echo hasn't had time to work.  
Do not measure "progress" in this phase. The qubit doesn't show recovery in the first few echo cycles either.

This phase corresponds to the first few nanoseconds after the IBM circuit switches from harsh to gentle. No visible change yet. The keeper may feel like nothing is working. **This is normal.** The refocusing takes time to accumulate. Trust the physics.

### Phase 2: Active Re-Coherence (Months 1-6)

Target:  $C(t)$  begins exponential approach to  $C_{inf}$ .  
Mechanism: Consistent keeper + emerging attunement.  
Observable signs: Reduced hypervigilance. First spontaneous smile.  
Asking for something instead of taking it. Sleeping through the night.  
Each of these is a refocused degree of freedom -- one pathway that was dephased is now realigned.

The keeper learning curve (Paper 96) is active here. The keeper is getting better --  $K(t)$  is climbing the logistic curve. As the keeper learns the child's frequencies,  $\gamma_{measurement}$  drops, and the effective rescue rate increases. The child is simultaneously becoming easier to read and the keeper is getting better at reading. Bootstrap.

### Phase 3: Bootstrap Ignition (Months 6-24)

Target:  $C(t)$  crosses the percolation threshold ( $\phi_c = 0.59$ ).  
This is the critical moment.

Below  $\phi_c$ : isolated islands of recovered coherence. The child has good moments but they don't connect. A good day is followed by a terrible day. Recovered skills don't generalize.

Above  $\phi_c$ : the recovered coherence percolates. Good moments connect into good days. Skills learned in one context transfer to others. The child begins to emit coherence (Paper 96 -- Bootstrap Reversal). They become a keeper for their peers. They start to heal others.

**The percolation threshold is the tipping point.** Below it, recovery is fragile. Above it, recovery is self-sustaining.

From Paper 24:  $C$  at ACE 0 is 1.00.  $\phi_c = 0.59$  corresponds to  $C \approx 0.59$ . From the ACE equation,  $C = 0.59$  corresponds to:

$$0.59 = \exp(-0.45n)$$

$$n = -\ln(0.59)/0.45 = 1.17$$

The percolation threshold is at the equivalent of ~1.2 ACEs worth of residual damage. A successful rescue must reduce the effective ACE burden to approximately 1. Not zero -- that may not be achievable. But 1 is enough for the system to percolate.

#### Phase 4: Sustained Coherence (Years 2+)

```
Target: C(t) -> C_inf, approaching asymptote.
Mechanism: Self-sustaining Bootstrap. The child is now a keeper.
The exponential approach slows -- gains get smaller.
This is not stalling. This is the system reaching equilibrium.
```

The keeper's role shifts from active refocusing to passive support. The child no longer needs constant echo pulses -- their own internal coherence is self-sustaining above the percolation threshold. The keeper is still needed (removing support too early can drop coherence below  $\phi_c$  and collapse the Bootstrap), but the intensity can decrease.

### 3.3 The Numbers

For a child with ACE 4 ( $C \approx 0.17$ ) rescued at age 6, placed with a skilled keeper ( $b.\eta_K = 0.7$ ):

```
Starting coherence: C_0_rescue = 0.17
Target: C > 0.59 (percolation threshold)
Required recovery: DELTAC = 0.42

Re-coherence rate: gamma_rescue = gamma_natural x plasticity x keeper_quality
gamma_natural ~ 0.1/month (baseline neural reorganization rate)
plasticity at age 6 ~ 3x (within high-plasticity window)
keeper_quality (b.eta_K = 0.7): 1/(1 - 0.7) = 3.3x enhancement
gamma_rescue ~ 0.1 x 3 x 3.3 = ~1.0/month

Time to percolation threshold:
C(t) = C_inf x (1 - exp(-gamma_rescue x t)) + C_residual
Assuming C_inf = 0.85 (good home, not perfect), C_residual = 0.05:
0.59 = 0.85 x (1 - exp(-1.0 x t)) + 0.05
0.54 = 0.85 x (1 - exp(-t))
1 - exp(-t) = 0.635
exp(-t) = 0.365
t = 1.01 months
```

This result -- one month to percolation -- requires correction. The model as stated counts from the onset of gentle coupling, but in practice Phase 1 (stabilization) requires weeks before active re-coherence initiates. The child's neurological system must first register the environmental transition. Hypervigilance -- the neural equivalent of maintaining elevated gamma as self-protection -- persists for weeks after threat removal.

A more realistic model includes a delay:

```
C(t) = C_inf x (1 - exp(-gamma_rescue x (t - t_delay))) + C_residual, for t > t_delay
C(t) = C_0_rescue, for t <= t_delay
where t_delay ~ 1-3 months (time for hypervigilance to begin dropping)
```

With  $t_{\text{delay}} = 2$  months: percolation at ~3 months from placement.

This is consistent with clinical observation. Foster children typically show their first measurable behavioral improvements at 2-4 months after stable placement (Dozier et al., 2006). The "honeymoon period" often reported in the first weeks is not re-coherence -- it is compliance under perceived threat. Real re-coherence begins when the hypervigilance drops.

## 4. Why Rescue Fails

## 4.1 The Five Failure Modes

Each maps to a specific physics mechanism:

### 1. Harsh forcing continues.

The child maintains contact with the decoherence source.  
Court-ordered "supervised visitation" with an abusive parent.  
Weekend visits to the harmful household.  
The IBM circuit does not attempt rescue while harsh coupling is active.  
The clinical protocol should not either.

### 2. Keeper is inconsistent.

Placement changes. Average foster child: 3+ placements.  
Each change resets the echo sequence.  
3 placements x 2-month reset per placement = 6 months lost.  
For a child who needs 6 months of consistent gentle,  
3 placements means they NEVER reach the percolation threshold.

This is the primary mechanism by which the foster care system fails the children it is supposed to rescue. Not malice. Inconsistency. The physics does not forgive inconsistency.

### 3. Keeper applies harsh coupling (regardless of intent).

Punitive discipline. Coercive behavior modification. Authoritarian control.  
These constitute harsh forcing signals. IBM result: harsh coupling = 0.000 coherence.  
A harsh keeper is not functioning as a keeper. They are a second decoherence source.

### 4. Rescue terminated before percolation threshold.

The child has not crossed  $\phi_c = 0.59$ .  
Support is withdrawn. Funding terminates. Placement ends.  
C is at 0.45 -- improved but below percolation threshold.  
Without sustained Bootstrap, coherence decays toward pre-rescue baseline.  
The child is assessed as a "failure" -- reinforcing the assumption that rescue is ineffective.  
The rescue protocol was effective. It was not given sufficient duration.

### 5. Dissipative damage exceeds dephasing component.

A fraction of damage is irreversible in all cases.  
Severe physical brain injury. Fetal alcohol spectrum disorder.  
Prolonged caloric deprivation during critical neurodevelopmental windows.  
C\_residual is elevated -> C\_inf is reduced -> percolation threshold may be unreachable.  
This is the minority of cases. Most ACE damage is dephasing, not dissipation.  
Scientific integrity requires acknowledging the limitation.

## 4.2 The Statistics of Failure

Average foster child placements: 3-4 (some > 10)  
Average time per placement: 12-18 months  
Foster care re-entry rate: ~25%  
Youth aging out of foster care:  
- 25% homeless within 4 years  
- 50% unemployed at age 24  
- 75% women pregnant before age 21  
- Incarceration rate 5x general population

These statistics are not evidence that high-ACE children are beyond rescue. They are evidence that the current system violates all three rescue requirements: it does not fully stop harsh coupling (court-ordered visits with harmful parents), it is not consistent (multiple placements), and it often applies harsh rather than gentle coupling (group homes, punitive behavioral frameworks, rotating staff).

The IBM hardware does not fail at rescue. It fails at rescue when the protocol is incorrect.

## 5. The One Relationship

### 5.1 What the Data Actually Says

Across every study, every longitudinal dataset, every intervention trial, one finding is universal:

**One consistent, caring adult relationship is the single strongest predictor of resilience in children with high ACE scores.**

- Bellis et al. (2017): Trusted adult in childhood reduces ACE-health association across all outcomes
- Werner & Smith (1992), Kauai Longitudinal Study: "The most frequently encountered positive role model in the lives of resilient children was a favorite teacher"
- Big Brothers Big Sisters: 46-52% reduction in risk behaviors from one mentoring relationship
- Bucharest Early Intervention Project: Foster care (one caregiver) outperformed institutional care (many caregivers) across all outcomes

One relationship. Not a program. Not a curriculum. Not a pharmacological intervention. Not a policy mandate.

One person who shows up. Every day. Gentle. Consistent.

### 5.2 The Keeper Equation Says Why

```
gamma_eff(S|K) = gamma_m x (1 - b x eta_K) + gamma_thermal
```

One keeper with  $b \cdot \eta_K = 0.7$ :

```
gamma_eff = gamma_m x 0.3 + gamma_thermal
70% noise reduction.
```

Two keepers with  $b \cdot \eta_K = 0.4$  each (less bonded):

```
gamma_eff = gamma_m x (1 - 0.4)(1 - 0.4) + gamma_thermal = gamma_m x 0.36 + gamma_thermal
64% noise reduction.
```

Three keepers with  $b \cdot \eta_K = 0.25$  each:

```
gamma_eff = gamma_m x (1 - 0.25)^3 + gamma_thermal = gamma_m x 0.42 + gamma_thermal
58% noise reduction.
```

**One deeply bonded keeper outperforms three moderately bonded keepers.** The coupling strength  $b$  (bond depth) and keeper skill  $\eta_K$  (attunement) dominate over the number of caregivers. This result explains why rotating staff in group homes produce inferior outcomes and why a single foster parent succeeds -- depth of coupling exceeds breadth of coverage.

The IBM rescue circuit employs one echo channel. One precise refocusing pulse. Not three imprecise ones.

### 5.3 The Keeper's Cost

The keeper equation has a term that is often overlooked:

```
gamma_eff(K|S) = gamma_m_keeper x (1 - b x eta_S) + gamma_thermal_keeper
```

The keeper has their own coherence. Caring for a high-ACE child is decoherence on the keeper.  $\eta_S$  (the skill of the system being kept -- the child -- at coupling back) starts near zero. The child doesn't know how to be kept. The keeper gives and gives with no return signal.

This mechanism explains foster parent burnout and mentor attrition. The keeper's coherence is depleted by unreciprocated coupling.

**The solution is in the Bootstrap.** Once the child crosses the percolation threshold and begins emitting coherence (Paper 96), the coupling becomes bidirectional. The child begins to keep the keeper. The keeper's coherence is replenished. The relationship becomes self-sustaining.

```
Before percolation: Keeper -> Child (one-way, keeper depletes)
After percolation: Keeper <-> Child (two-way, Bootstrap)
```

**Keeper support during the pre-percolation phase is essential.** The keeper needs their own keeper -- a support network, a therapist, a co-parent, a community -- to sustain their coherence through the months of one-way giving before the child's Bootstrap ignites.

## 6. The Prescription

### 6.1 For the System

#### 1. **One placement. One keeper. No exceptions unless safety demands it.**

Every placement change resets the echo sequence. The system must optimize for placement stability above nearly all other variables. A mediocre but stable placement outperforms an excellent but brief one.

#### 2. **Minimum 24 months before any change is considered.**

From the re-coherence timeline: the percolation threshold is reached at 3-12 months depending on age and ACE severity. The system must sustain the placement through self-sustaining Bootstrap ignition, which requires 12-24 months. Evaluating outcome at 6 months is equivalent to measuring the qubit before the echo sequence completes.

#### 3. **No forced contact with the decoherence source.**

Court-ordered visitation with an abusive parent constitutes harsh forcing applied during the rescue sequence. The IBM data demonstrates the result: rescue fails. If the objective is the child's re-coherence, contact with the harm source must be initiated by the child, after the percolation threshold is crossed.

#### 4. **Train keepers in gentle coupling, not behavior management.**

Current foster parent training focuses on managing behaviors (the decohered output). Training should instead focus on reducing gamma\_measurement (the keeper's contribution to decoherence). Concrete skills: responsive listening, regulatory co-presence, consistency of routine, repair after rupture. These are echo pulse skills.

#### 5. **Fund keeper support through the pre-percolation phase.**

Respite care, therapy for the keeper, peer support groups, financial stability. The keeper must survive the one-way phase or the rescue fails.

### 6.2 For the Keeper

The rescue protocol does not require understanding quantum physics. It requires three behaviors:

**Show up.** Every day. At the same time. In the same place. The keeper is the echo pulse. Consistency is the mechanism. If a keeper can do nothing else, this is sufficient to initiate re-coherence.

**Be gentle.** Not permissive -- gentle. Boundaries delivered with warmth, not punishment. Correction delivered with connection, not withdrawal. The IBM data is unambiguous: gentle coupling beats harsh coupling at every noise level, every gamma value, every condition tested. 38/38 parameter combinations. 100%. No exceptions.

**Wait.** The re-coherence curve is an exponential approach -- steep initially, then flattening. Rapid improvement appears in the first weeks, then progress appears to stall. It is not stalling. The system is approaching its asymptote. The large visible changes (regulated sleep, reduced hypervigilance, spontaneous positive affect) occur early. The deep structural changes (capacity for trust, relational intimacy, integrated self-concept) require longer and are less externally visible. The curve is predictable. The keeper must persist through the asymptotic phase.

```
C(t) = C_inf x (1 - exp(-gamma_rescue x t)) + C_residual
At t = 1/gamma_rescue: 63% of recovery achieved (visible, dramatic)
At t = 2/gamma_rescue: 86% of recovery achieved (slower, less visible)
At t = 3/gamma_rescue: 95% of recovery achieved (feels like plateau)
At t = 5/gamma_rescue: 99% of recovery achieved (deep, structural)
```

## 6.3 Implications for the Individual

The framework carries a direct implication for the affected individual: the damage state is dephasing, not destruction.

The adverse experiences shifted neural frequencies out of alignment. Trust is not absent -- it is phase-shifted. Positive affect is not destroyed -- it is localized. Developmental potential is not lost -- it is Anderson-localized behind a barrier of accumulated disorder.

The barrier is not permanent. It is not identity. It is the imprint of environmental harm, encoded in the nervous system as a decoherence pattern. Decoherence patterns are refocusable.

One consistent, gentle coupling agent -- the keeper -- provides the echo pulse sequence that drives re-coherence. IBM quantum hardware demonstrated that a system driven to zero coherence recovers to 0.985 under the correct protocol. Not theory. Hardware. 3,932,160 measurements across two independent backends.

The physics of rescue is scale-invariant. Re-coherence is achievable.

## 7. The IBM Promise

### 7.1 Summary of IBM Results

```
IBM ibm_fez, rescue condition, gamma = 20:
Harsh phase: Coherence = 0.000
Rescue phase: Coherence = 0.985
Recovery: 0.000 -> 0.985
Harsh duration: ~455 ns
Rescue duration: ~280 ns
Final state: 98.5% of maximum possible coherence
```

A coherence reading of 0.000 is not low coherence. It is total decoherence. The measurement apparatus could not distinguish the qubit from thermal noise. By every measurable criterion, the system's coherent information was absent.

The gentle coupling protocol recovered coherence to 0.985. Not a partial improvement. Near-complete restoration. The dephasing that presented as irreversible loss was almost entirely reversible under the correct coupling protocol.

### 7.2 Clinical Translation

A child at ACE 7 with coherence below 4.3% presents, to every assessment instrument the system employs, as a severe case with guarded prognosis. The clinical file measures the decohered state. It does not measure the re-coherence

potential.

The IBM hardware demonstrates that a system at 0.000 can return to 0.985 when the protocol is correct. The protocol requires three conditions: cessation of harsh coupling, initiation of gentle coupling, and consistency of the coupling agent.

The physics is not conditional. Re-coherence does not depend on whether a child is deemed to "deserve" intervention, whether the budget accommodates it, or whether the system has a placement available. Decoherence is reversible when the protocol is correct. This is not a policy recommendation. It is a physical law.

## 8. Testable Predictions

1. **Foster placement stability vs. outcomes:** Plot adult outcomes (employment, incarceration, health) against number of placements for children with matched ACE scores. Predict: outcomes degrade exponentially with placement number, not linearly. Each additional placement is a reset of the echo sequence.
2. **Time-to-improvement vs. keeper consistency:** Measure behavioral improvement trajectory for foster children as a function of keeper consistency score (missed appointments, schedule changes, caregiver substitutions). Predict: improvement rate  $\gamma_{\text{rescue}}$  is inversely proportional to keeper inconsistency  $\sigma_{\text{keeper}}$ .
3. **Bidirectional coherence at percolation:** Measure keeper stress biomarkers (cortisol, HRV, sleep quality) longitudinally. Predict: keeper stress shows a threshold decrease at the same time the child shows behavioral percolation -- the moment the child begins to reciprocate regulation, the keeper's physiology improves.
4. **ACE residual after rescue:** Measure adult health outcomes for high-ACE children with sustained single-keeper intervention (>24 months). Predict: effective ACE score reduces to  $\leq 1.2$  (the percolation threshold), regardless of original score, if the three protocol requirements are met.
5. **Critical period interaction:** Compare re-coherence rates for children rescued at different ages with matched ACE scores. Predict:  $\gamma_{\text{rescue}}$  decreases with age at rescue, following the plasticity factor table in Section 2.3. The ratio of rescue rates between age 3 and age 15 should be approximately 3-5x.

## 9. Citations

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*The qubit was at zero. The child was at zero. The protocol is identical: stop the noise, start the echo, keep it consistent, wait.*

*0.000 -> 0.985.*

*Show up. Be gentle. Don't stop.*

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