

FROM PREDATORS TO PRESSURE: EVOLUTIONARY BRAIN WIRING AND THE YOUTH SUICIDE CRISIS IN THE ANDAMAN & NICOBAR ISLANDS

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Abstract- India has one of the world's highest youth suicide rates, with the Andaman & Nicobar Islands among its most affected regions. While academic tension, unemployment, financial hardship, and relationship loss are visible triggers, this paper argues that youth suicide is rooted in an evolutionary mismatch: the brain's "survival wiring" misinterprets modern symbolic stressors as existential threats. Drawing on neurobiological and psychological research, the paper explores how amygdala-driven stress responses, neurotransmitter changes, and prefrontal cortex suppression contribute to suicidal impulses during crisis. Social amplifiers such as stigma and digital overload further intensify these vulnerabilities. The paper recommends evidence-based preventive strategies mindfulness and meditation integration, cognitive-behavioral interventions, regular mental health assessments, and community support to restore balance between ancient survival circuitry and present-day pressures. By reframing suicide as a neurobiological and social problem rather than a personal failure, this analysis calls for compassion-based, science-driven prevention in the region.

Keyword: youth suicide, evolution, stress, amygdala, Andaman & Nicobar Islands, prevention, mindfulness

1. Introduction

Youth suicide has become an alarming public health crisis in India. Between 2020 and 2022, suicides accounted for 17.1% of all deaths among individuals aged 15–29, making suicide the second leading cause of death in this demographic—surpassed only by road accidents The Times of India. This trend holds serious implications for national mental health agendas.

In the Andaman & Nicobar Islands (A&NI), the situation is particularly dire. The suicide rate in this Union Territory has consistently ranked among the highest in India, hitting *41.0 per 100,000 population in 2018*, rising to *45.5 in 2019*, and slightly dipping to *45.0 in 2020* Nicobar Times. By 2022, the NCRB reported a suicide rate of *42.8 per 100,000*, second only to Sikkim's 43.1 Arunachal Times The Times of India. With a small overall population, each case significantly impacts trends and highlights the acute nature of the crisis in isolated communities.

The root causes are multifaceted—academic pressure, unemployment, financial instability, and relationship breakdowns are commonly cited triggers. Yet these stressors alone do not fully explain the disproportionate emotional and lethal responses observed. To truly understand the underlying mechanism, it is essential to examine the evolutionary and neurobiological architecture of the human brain. What happens when neural circuits designed to detect tigers or tribal exile are confronted with modern symbolic threats like exam failure or romantic rejection?

This paper proposes that youth suicides are not mere sociological phenomena but are rooted in a fundamental mismatch: the ancient survival brain, particularly the amygdala and limbic circuits continues

to interpret academic, social, and emotional setbacks as existential threats. This results in “amygdala hijack”, where instinct overrides reason, leading to catastrophic actions in moments of crisis.

2. Ancestral Survival Story: Predators in the Jungle

Human evolution took place in highly unpredictable and dangerous environments where constant vigilance was essential for survival. Our Pleistocene ancestors lived as hunter-gatherers for nearly 95% of human evolutionary history (Tooby & Cosmides, 1992). In this ecological niche, survival was determined not only by the ability to secure food but, more critically, by the ability to detect and respond rapidly to threats such as predators, rival groups, or environmental hazards.

i. *Negativity Bias as an Evolutionary Adaptation*

The principle of asymmetric threat costs explains why the brain evolved to prioritize negative over positive information (Rozin & Royzman, 2001). Missing a potential positive event (e.g., fruit on a tree, successful hunt) resulted in a lost opportunity, but survival was still possible because food could be found later. By contrast, missing a negative event (e.g., a predator lurking in the grass) could mean instant death. Therefore, natural selection favored individuals who developed a “negativity bias” — a cognitive predisposition to detect, remember, and respond more strongly to threats than to rewards (Baumeister et al., 2001).

- **Positive Miss (Fruit):** Lost calories, minor cost; survival continued.
- **Negative Miss (Tiger):** Catastrophic cost; potential death.

This asymmetry ensured that overreacting to harmless cues (false alarms) was safer than underreacting to real threats. In modern cognitive science, this is known as error management theory (Haselton & Nettle, 2006).

ii. *Neurobiological Substrates of Survival Vigilance*

The central structure implicated in this adaptive vigilance is the amygdala, a bilateral almond-shaped cluster of nuclei within the limbic system. Neuroimaging studies demonstrate that the amygdala responds within 80–100 milliseconds to threatening stimuli, far faster than the prefrontal cortex can rationally evaluate them (LeDoux, 2000; Öhman, 2005). This rapid response primes the body for immediate fight-or-flight action, increasing heart rate, dilating pupils, and mobilizing glucose reserves.

The prefrontal cortex (PFC), which governs rational decision-making and long-term planning, evolved later in human history. However, during acute threat detection, the amygdala can override PFC regulation — a phenomenon popularly described as an “amygdala hijack” (Goleman, 1995). This mechanism was adaptive in ancestral environments, where milliseconds often determined life or death outcomes.

iii. *Illustrative Example (Story-Based)*

Consider a hunter-gatherer walking through tall grass. If he mistakes the rustling of the wind for a predator, he may waste energy fleeing unnecessarily a false positive. But if he dismisses the sound when it is, in fact, a stalking tiger, he risks death a false negative. Natural selection strongly penalized false negatives while tolerating false positives, shaping the modern human brain to react first, think later.

Thus, the survival advantage of this “better safe than sorry” mechanism explains why humans today remain biologically predisposed to over-detect threats.

3. Modern Youth Stressors as “New Predators”

Although modern environments no longer contain constant threats from wild predators, the human brain has not fully adapted away from its ancestral survival wiring. The amygdala, the brain’s alarm system, continues to react as though symbolic, social, and academic challenges are existential threats (LeDoux, 2000; Arnsten, 2009). This mismatch between ancient neural circuits and contemporary psychosocial stressors produces maladaptive responses, particularly among youth, who face heightened academic, financial, and relational pressures.

i. *Exams and Academic Failure → Predator Threat Analogy*

In ancestral times, the failure to detect or respond to a predator could mean immediate death. Today, many students interpret exam failure in a similar manner: catastrophic and irreversible. Cognitive neuroscience shows that performance pressure activates the hypothalamic-pituitary-adrenal (HPA) axis, elevating cortisol levels, impairing working memory, and suppressing prefrontal cortex functioning (Vogel & Schwabe, 2016). This is analogous to an “amygdala hijack” where rational thinking is bypassed. The perception becomes: “If I fail, my life is finished, my family will reject me.”

ii. *Job Interview Rejection → Loss of Resources*

For ancestral hunter-gatherers, access to food and shelter depended on group status and successful hunting or foraging. Modern job interviews serve as symbolic equivalents: failure is interpreted as loss of essential resources for survival. The brain's dopaminergic reward system (ventral striatum, nucleus accumbens) is deeply tied to resource acquisition. When expectations collapse, this loss triggers feelings of despair and hopelessness, similar to resource scarcity stress in evolutionary contexts (Nesse, 2000).

iii. *Relationship Breakup → Tribal Abandonment*

In tribal societies, rejection or exile from the group significantly reduced survival odds, as lone individuals were highly vulnerable to predators and starvation. Neuroscientific evidence shows that social rejection activates the anterior cingulate cortex (ACC), the same neural circuit involved in physical pain (Eisenberger et al., 2003). Hence, modern breakups are neurologically encoded as "*If I am abandoned, I will die.*" This explains why youth often perceive heartbreak as unbearable, sometimes escalating to suicidal ideation.

iv. *Financial Crisis → Loss of Food and Shelter*

Economic hardship triggers survival anxieties by activating neural pathways linked to scarcity and deprivation. In evolutionary terms, the inability to secure food and shelter equated to near-certain death. Modern neuroeconomic studies suggest that financial insecurity enhances amygdala reactivity, increasing vigilance and fear responses (Gianaros & Manuck, 2010). Thus, unemployment or debt may be encoded as existential threats, leading to chronic stress and depressive symptomatology.

v. *Social Media Criticism → Tribal Exile*

Humans evolved in small groups where reputation determined acceptance or exclusion. Exile was effectively a death sentence, as survival depended on belonging to the tribe. Today, online criticism, cyberbullying, or loss of social validation are neurologically processed as social exclusion, again activating the ACC and insula (Kross et al., 2011). To the survival brain, rejection on social media can feel equivalent to being cast out from the tribe.

iv. *Survival Brain Mislabeling Symbolic Threats*

Thus, although modern threats are symbolic rather than physical, the survival brain mislabels them as predators. This is an example of evolutionary mismatch adaptive mechanisms from ancestral environments are maladaptive in modern contexts (Li et al., 2018). The result is disproportionate stress responses that overwhelm coping mechanisms, particularly in vulnerable youth populations.

In short: The jungle has changed, but the brain has not.

4. Amygdala Hijack: Why Logic Shuts Down

The human brain evolved to react to danger faster than it can think. This reflex ensured survival in ancestral environments but creates maladaptive responses in today's youth when symbolic threats (exams, breakups, rejection) are misinterpreted as life-or-death scenarios. *Stepwise Sequence of Amygdala Hijack*

i. *Amygdala Activation – Threat Detection*

- The amygdala, located in the limbic system, acts as the brain's early warning system. It scans for danger and reacts within milliseconds — often before conscious awareness (LeDoux, 2000).
- In ancestral times: a sudden rustle in the bushes could signal a predator.
- In modern youth: an exam failure, breakup, or financial loss is tagged by the amygdala as a "predator," triggering alarm signals.

ii. *Hypothalamus–Pituitary–Adrenal (HPA) Axis – Hormonal Cascade*

- Once the amygdala perceives threat, it activates the hypothalamus, which signals the pituitary gland and adrenal glands to release cortisol and adrenaline (McEwen, 2007).
- This stress hormone surge prepares the body for fight, flight, or freeze: heart rate increases, muscles tense, and glucose floods the bloodstream for rapid energy.

iii. *Fight, Flight, or Freeze Response*

- For ancestors: flee from a tiger, fight an enemy, or freeze to avoid detection.
- For today's youth: panic during an exam, emotional outburst after breakup, or paralysis in the face of financial/job stress.

iv. *Prefrontal Cortex Suppression – Logic Offline*

- During acute stress, cortisol impairs the prefrontal cortex (PFC) the rational, logical, decision-making part of the brain (Arnsten, 2009).
- With the PFC suppressed, long-term planning and impulse control collapse, leaving the amygdala “in charge.”
- This is the “amygdala hijack” (Goleman, 1995): the survival brain overrides the logical brain.

5. Ancestors vs. Modern Youth

- **Ancestors:** The hijack was adaptive. Mistaking wind for a tiger (false alarm) wasted energy but kept them safe. Logical evaluation could come later, once immediate survival was secured.
- **Modern Youth:** The same mechanism misfires. An exam failure or breakup is not a predator, yet the brain responds as though life is at risk. The amygdala blocks rational PFC reasoning, so youth cannot see the temporary nature of stress. Suicide, tragically, is then perceived as the only possible “escape.”

Why Suicide Feels Like Escape During Hijack!

When the survival brain dominates:

- Logical distinctions between “temporary failure” and “permanent doom” disappear.
- Emotional pain circuits (anterior cingulate cortex) amplify distress (Eisenberger et al., 2003).
- The hijack produces tunnel vision: the brain sees only one path — escape, often through self-harm.

Thus, suicide in these contexts is not a rational decision but a neurobiological misfiring of survival systems, where symbolic threats are mistaken for predators, and the logical brain is silenced.

6. Neurotransmitter Dynamics in Youth Stress & Heartbreak

When youth experience academic failure, job rejection, or heartbreak, the brain undergoes significant neurochemical changes. These changes explain why setbacks that are temporary in reality can feel permanent and unbearable in the mind.

i. *Dopamine – The Reward and Motivation Chemical*

- Dopamine fuels the brain's reward system (nucleus accumbens and ventral tegmental area). It drives motivation, goal pursuit, and feelings of pleasure (Schultz, 2015).
- After success (good exam score, relationship bond), dopamine rises, reinforcing positive behaviors.
- After failure or breakup, dopamine levels fall sharply, producing feelings of emptiness, lack of motivation, and hopelessness. *In ancestral terms:* dopamine reward guided hunting and food search. Failure meant no reward → energy loss. For youth today, exam failure or breakup creates the same “empty” signal in the brain.

ii. *Oxytocin – The Bonding Hormone*

- Oxytocin is crucial for social bonding and trust, often called the “love hormone” (Carter, 1998).
- During relationships, oxytocin reinforces attachment. When bonds break, oxytocin drops dramatically.
- The brain interprets this drop as social death similar to being exiled from the tribe in ancient times. *Modern youth breakup:* feels life-threatening not because of rational logic, but because the brain encodes lost attachment as a survival risk.

iii. *Serotonin – The Mood Regulator*

- Serotonin maintains mood stability, emotional resilience, and impulse control.
- Low serotonin levels are strongly linked to depression, impulsivity, and suicidal thoughts (Mann, 2003).

- Stress and rejection reduce serotonin, making youth more vulnerable to despair.
- For ancestors, serotonin stability helped balance risks vs. rewards. Low serotonin today increases “all-or-nothing” thinking, making youth feel they cannot survive setbacks.

iv. *Cortisol – The Stress Hormone*

- Cortisol, released via the *HPA axis*, is vital for immediate fight-or-flight.
- Chronic elevation, however, damages the **hippocampus** (memory and learning center), impairs emotional regulation, and reinforces hopelessness (McEwen, 2007).
- *In exams*: a small cortisol spike sharpens focus, but prolonged stress damages memory, worsening performance and creating a vicious cycle of failure and despair.

v. *Anterior Cingulate Cortex (ACC) – Social Pain Overlap*

- fMRI studies show the ACC activates during social rejection, the same region that lights up for physical pain (Eisenberger et al., 2003).
- This explains why heartbreak or humiliation literally “hurts” in the brain.
- *For ancestors*: rejection meant loss of tribe → near-certain death. For youth: breakup, social media bullying, or exclusion feels equally catastrophic at a neurological level.

7. Psychological & Social Amplifiers

While neurobiology explains the core mechanisms behind youth vulnerability, psychological and social contexts act as amplifiers, worsening stress perception and increasing suicide risk.

i. *Early Conditioning*

From childhood, many individuals are exposed to warnings and criticism rather than affirmations. Phrases such as “*don’t fail*,” “*be careful*,” or “*you will bring shame*” reinforce fear-based cognition. This aligns with Beck’s cognitive theory of depression, which emphasizes the role of negative core beliefs and maladaptive schemas in shaping stress vulnerability (Beck, 2011). Over time, such conditioning strengthens the brain’s negativity bias, priming youth to interpret setbacks as catastrophic.

ii. *Social Media & Digital Exposure*

In ancestral societies, *reputation within the tribe determined survival*. Exile or rejection equaled death. Modern social media replicates this dynamic at a global scale. Constant exposure to curated success stories, online criticism, and cyberbullying exacerbates comparison-driven stress (Twenge & Campbell, 2018). fMRI studies show that social rejection activates the same neural pain circuits as physical pain (Eisenberger et al., 2003), explaining why online exclusion or humiliation feels unbearable to many youth.

iii. *Cultural & Academic Pressures*

In India, cultural expectations around academic success, employment, and marriage create immense psychological pressure. Failure is not just a personal setback but often perceived as a family or societal dishonor. This magnifies the “*predator illusion*” of the survival brain: instead of a tiger, it is poor exam results or job failure that trigger life-or-death responses. Stigma around mental health further prevents youth from seeking help, leaving them vulnerable to impulsive decisions.

8. Discussion: Bridging Ancient Brain and Modern Stress

The rising suicide rates in the Andaman & Nicobar Islands and India at large cannot be understood solely as social problems. They represent a neurobiological mismatch between ancient survival adaptations and modern symbolic stressors.

i. *Survival Brain Misinterpretation*

The amygdala continues to detect symbolic stressors (exams, rejection, financial distress) as existential threats. This leads to **amygdala hijack**, shutting down prefrontal cortex logic (Arnsten, 2009; Goleman, 1995).

ii. *Neurotransmitter Dysregulation*

Failures and heartbreaks alter brain chemistry: dopamine and oxytocin drops create emptiness and social pain; serotonin deficits lower resilience; cortisol surges damage memory and amplify hopelessness (Mann, 2003; McEwen, 2007).

iii. *Psychosocial Reinforcement*

Negative childhood conditioning, social media pressures, and cultural stigmas act as amplifiers, making symbolic stressors appear more threatening than they objectively are.

9. Preventive Strategies: Rewiring the Mismatch

To reduce youth suicides, interventions must directly strengthen the logical brain (prefrontal cortex, PFC) while calming the survival brain (amygdala and HPA axis). These strategies work by correcting the mismatch between ancient threat-detection systems and modern symbolic stressors.

i. Mindfulness & Meditation

Meditation is one of the most evidence-based methods for reducing stress and preventing suicide risk.

- **Parasympathetic Nervous System (PNS) Activation**
Stress activates the sympathetic nervous system (fight-or-flight), but meditation stimulates the vagus nerve, which in turn activates the parasympathetic nervous system (PNS). This reduces heart rate, lowers blood pressure, and decreases cortisol levels (Jerath et al., 2006).
- **Cortisol Reduction**
Chronic cortisol damages the hippocampus and impairs rational thought. Mindfulness meditation and breathing practices reduce cortisol, protecting brain function and emotional balance (Pascoe et al., 2017).
- **Strengthening Prefrontal Cortex (PFC)**
Neuroimaging studies show meditation increases gray matter density in the PFC (Hölzel et al., 2011). This strengthens decision-making, impulse control, and resilience against amygdala hijack.
- **Cultivating Self-Awareness**
Mindfulness enhances metacognition the ability to observe thoughts non-judgmentally. This interrupts catastrophic thinking (e.g., “I failed, my life is over”) and builds emotional stability (Tang et al., 2015).

Practical Implementation: Introduce structured meditation practices like Sahaja Yoga, Vipassana, and Art of Living in schools, colleges, and workplaces across the Andaman & Nicobar Islands.

ii. Cognitive Behavioral Therapy (CBT)

CBT is a gold-standard, evidence-based therapy for depression and suicide prevention.

- It identifies automatic negative thoughts and restructures them into balanced alternatives (Beck, 2011).
- Helps youth reframe failures as temporary challenges rather than catastrophic threats.
- Particularly effective in reducing suicidal ideation by strengthening rational evaluation over emotional impulses.

Implementation: Train school/college counsellors in CBT methods and integrate them into mental health support systems.

iii. Breathing & Relaxation Techniques

Breathing exercises directly influence the autonomic nervous system.

- Diaphragmatic breathing and pranayama stimulate parasympathetic pathways, lowering cortisol and restoring calm (Jerath et al., 2006).
- These techniques improve heart rate variability (HRV), a marker of resilience and stress tolerance.
- Regular practice reduces exam anxiety, panic attacks, and emotional reactivity.

Implementation: Daily 10–15 minutes of guided breathing sessions in schools and colleges as part of physical education or wellness programs.

iv. Community & Social Support

Humans evolved in tribes where belonging ensured survival. Isolation or rejection, even symbolic, still feels life-threatening.

- Community support reduces the survival brain’s “tribal exile” illusion.
- Peer mentoring, parental awareness programs, and campus well-being committees foster belonging and validation.
- Strong social ties buffer the effects of stress and reduce suicide risk.

Implementation: Establish mental health clubs, Red Ribbon/Youth Red Cross groups, and peer-support cells in educational institutions across the islands.

10. Conclusion

The persistent youth suicide crisis in the Andaman & Nicobar Islands exemplifies an evolutionary mismatch: ancient brain circuitry, tuned to identify mortal dangers, now misfires in response to symbolic modern pressures such as exams, job rejections, financial setbacks, and relationship losses. The region's suicide rates remain among the nation's highest—about **42.8 per 100,000** in 2022, second only to Sikkim and several times higher than India's average. In this insular community, each loss resonates profoundly, underscoring the urgent need for nuanced, compassionate intervention.

During acute symbolic stress, the amygdala rapidly floods the brain with hormonal alarms, overwhelming the logical functions of the prefrontal cortex—a process known as “amygdala hijack.” This neurobiological vulnerability, deeply rooted in survival priorities, makes temporary setbacks feel like irredeemable failures, sometimes compelling youth to see suicide as the only escape. Preventing such tragedies requires a shift from blame or punitive approaches to ones grounded in neuroscience, empathy, and community action.

Key Preventive Strategies:

- **Mindfulness and Meditation Integration:** Structured practices (e.g., Sahaja Yoga, Vipassana, Art of Living) reduce cortisol, foster emotional regulation, and strengthen prefrontal cortex functioning, helping override instinctive, catastrophic responses to disappointment. Integration of such programs in schools, colleges, and workplaces can lay a foundation of long-term resilience (Tang et al., 2015).
- **Regular Mental Health Assessments:** Mandatory, quarterly psychological screenings in educational settings can help identify at-risk youth early, enabling interventions before crises emerge. Using validated stress, anxiety, and depression inventories ensures rigour and consistency in prevention.
- **Enhanced Counselling and Psychological Support:** Expanding the cadre of trained mental health professionals, especially in rural or underserved areas, and establishing dedicated support cells in schools/colleges for ongoing workshops and counselling is critical. Rapid-response mechanisms with local authorities and mental health professionals further reduce risk.
- **Community and Policy Reform:** Destigmatizing mental health is imperative. Public campaigns involving families, educators, and community leaders normalize open dialogues and empower youth to seek help without shame. Establishing robust helplines, de-addiction centers, and peer-support groups ensures a safety net even in remote settings.
- **Holistic, Community Driven Approach:** Both administrative and grassroots efforts should synergize—addressing not just psychological but also historical, economic, and cultural contributors to youth distress in these islands. Holistic support encourages collective resilience, counters isolation, and ensures all youth feel valued and supported.

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