

Neon-Affect: Emotional Trajectory Analysis

A Supplement to the Neon-Affect Deep Code Analysis

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Unified Pathology-Pattern Interaction Analysis with Trajectory Phase Detection, Compound Cross-Referencing, Narrative Generation, and Psychological Framework Mapping

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S1. Introduction

The Neon-Affect system now operates two independent detection engines — the **Pathology Detector** (5 families, 40 motifs, 15 compounds) and the **Emotion Pattern Detector** (15 families, 120 motifs, 15 compounds). Each produces its own result after every emotion addition, but until now the system had no way to reason about the *relationship* between pathological and positive signals.

The **Emotional Trajectory Analyzer** bridges this gap. It takes both detector outputs and produces a unified analysis that identifies:

- **Trajectory phase** — one of seven states (CRISIS, STRUGGLING, RECOVERING, STABLE, CONFLICTED, GROWING, THRIVING) based on the balance between pathology severity and pattern strength.
- **Interaction signals** — specific detected pairings where pathology families and emotion pattern families co-occur, classified as opposing, reinforcing, or uncontested.
- **Compound cross-references** — meaningful co-occurrences of pathology compounds (DEPRESSION, ANXIETY, TRAUMA, etc.) with pattern compounds (HEALING, MINDFULNESS, TRANSFORMATION, etc.).
- **Trajectory narrative** — a qualitative natural-language sentence describing the agent's emotional state, active dynamics, and overall direction.
- **Net balance score** — pattern strength minus pathology severity, ranging from -4 (strongly negative) to +4 (strongly positive).

S1.1 New Files

File	Type	Purpose
TrajectoryAnalysisResult.java	Plain Java	Analysis output structure
EmotionalTrajectoryAnalyzer.java	Plain Java	Unified analysis engine

S1.2 Design Principle

The analyzer does not re-examine the raw affect history. It operates entirely on the *outputs* of the two detectors — their matched motifs, compound patterns, severity/strength scores, dominant families, and dynamics parameters. This layered architecture means the analyzer reasons about *what the detectors found*, not about raw emotional data. Each layer has a clear responsibility:

Layer	Input	Output
Foundation	Raw affect history	Dynamics parameters, categories
Pathology Detector	Categories + dynamics	Severity, pathology compounds, tier 2 route
Emotion Pattern Detector	Categories + dynamics	Strength, pattern compounds, dominant family
Trajectory Analyzer	Both detector results	Phase, interactions, narrative, net balance

S2. Trajectory Phases

The analyzer classifies the agent's emotional state into one of seven phases:

S2.1 Phase Definitions

Phase	Constant	Condition	Meaning
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CRISIS	0	Severity >= SEVERE, Strength <= FAINT	Acute emotional distress with no positive counterbalance
STRUGGLING	1	Severity >= MODERATE, Strength <= MODERATE	Active pathology with insufficient positive patterns
RECOVERING	2	Both present + opposing signals, strength > severity or cross-refs exist	Positive patterns emerging against residual pathology
STABLE	3	Neither strong pathology nor strong positive	Emotional baseline with no strong signals
CONFLICTED	4	Both >= MODERATE + opposing signals, no cross-refs	Genuine tension between pathology and positive patterns
GROWING	5	Severity <= MILD, Strength >= MODERATE	Positive trajectory with minimal pathological concern
THRIVING	6	Severity = NONE, Strength >= STRONG	Dominant positive patterns with no pathology

S2.2 Phase Determination Logic

The phase determination evaluates conditions in priority order:

```
if (severity >= SEVERE && strength <= FAINT) → CRISIS

if (severity >= MODERATE && strength >= MODERATE && hasOpposingSignals) {
  if (crossRefs exist || strength > severity) → RECOVERING
  else → CONFLICTED
}

if (severity >= MODERATE && strength <= MODERATE) → STRUGGLING

if (severity == NONE && strength >= STRONG) → THRIVING

if (severity <= MILD && strength >= MODERATE) → GROWING

if (severity >= MODERATE && hasOpposingSignals) → RECOVERING

default → STABLE
```

The critical distinction between RECOVERING and CONFLICTED lies in the compound cross-references. When pathology compound DEPRESSION co-occurs with pattern compound HEALING, the system detects meaningful recovery rather than mere coexistence. Without such cross-references and with balanced scores, the signals are in genuine conflict — the agent is experiencing both pathology and positive patterns without clear resolution.

S3. Interaction Signals

S3.1 Opposing Pairs

The five pathology families map to natural counterpart emotion pattern families. When both sides of a pair are detected, an opposing interaction signal is generated:

Pathology Family	Emotion Pattern Family	Interaction Description
DESCENT	ASCENT	Upward momentum counteracting downward trajectory
DESCENT	RESILIENCE	Active recovery from emotional descent

OSCILLATION	STABILITY	Stabilizing forces against emotional oscillation
OSCILLATION	REGULATION	Emerging regulation of oscillating states
FIXATION	FLEXIBILITY	Adaptive range breaking through emotional fixation
FIXATION	GROWTH	Growth patterns loosening fixated states
ERUPTION	REGULATION	Developing containment of eruption patterns
ERUPTION	INTEGRATION	Processing and integrating eruption experiences
DISCONNECT	ENGAGEMENT	Re-engagement counteracting emotional withdrawal
DISCONNECT	BONDING	Reconnection overcoming disconnection patterns

Each opposing signal receives a significance level based on the severity and strength scores:

Significance	Condition	Label
CRITICAL	Severity >= SEVERE and Strength >= STRONG	High-stakes active opposition
SIGNIFICANT	Severity >= MODERATE or Strength >= MODERATE	Meaningful counterbalance
NOTABLE	Otherwise	Minor signal worth tracking

S3.2 Reinforcing Pairs

Some pathology-pattern combinations are not strictly opposing but represent subtler interactions:

Pathology	Pattern	Interaction
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DESCENT	INTEGRATION	Processing descent through emotional integration
OSCILLATION	COMPLEXITY	Oscillation reflecting emotional complexity processing
ERUPTION	INTENSITY	Eruption energy channeled into intensity patterns
FIXATION	STABILITY	Fixation masking as stability — verify genuine equilibrium
DISCONNECT	FLOW	Disconnect coexisting with flow — possible selective engagement

Reinforcing signals are always rated NOTABLE. The FIXATION/STABILITY pair is particularly important — it warns that what appears to be healthy stability may actually be pathological fixation. The detector can match both because the category sequences overlap (repeated same-state patterns), but the dynamics qualifiers should differentiate them (stability requires low volatility + high inertia genuinely, while fixation detects negative-state repetition).

S3.3 Uncontested Pathology

When a pathology family is detected at MODERATE or higher severity with *no* counterbalancing emotion pattern family, an uncontested signal is generated:

```
if (!hasCounterpartPattern && severity >= MODERATE) {
    signal = "Uncontested [family] pathology with no counterbalancing pattern"
    significance = severity >= SEVERE ? CRITICAL : SIGNIFICANT
}
```

An uncontested DESCENT at SEVERE severity means the agent is experiencing significant emotional decline with no evidence of recovery, resilience, or upward momentum — the most concerning signal the analyzer can produce.

S4. Compound Cross-References

S4.1 Cross-Reference Table

When pathology compounds and pattern compounds co-occur, the analyzer generates cross-references representing meaningful clinical-wellness interactions. The full table contains 32 cross-references across all 15 pathology tags and 15 pattern tags:

Pathology Compound	Pattern Compound	Cross-Reference Description
DEPRESSION	HEALING	Healing from depressive trajectory
DEPRESSION	BREAKTHROUGH	Breaking through depressive pattern
DEPRESSION	TRANSFORMATION	Transformative recovery from depression
ANXIETY	MINDFULNESS	Mindfulness managing anxiety patterns
ANXIETY	SERENITY	Achieving serenity despite anxiety
ANXIETY	EQUANIMITY	Developing equanimity against anxiety
BIPOLAR	EMOTIONAL_MASTERY	Developing mastery over bipolar oscillation
BIPOLAR	EQUANIMITY	Equanimity emerging from bipolar pattern
BORDERLINE	EMOTIONAL_MASTERY	Building emotional mastery against borderline instability
BORDERLINE	SECURE_ATTACHMENT	Secure attachment forming despite borderline patterns
TRAUMA	HEALING	Active healing from trauma re-experiencing

TRAUMA	TRANSFORMATION	Post-traumatic growth and transformation
BURNOUT	VITALITY	Vitality returning after burnout
BURNOUT	PRESENCE	Re-establishing presence after burnout
HELPLESSNESS	BREAKTHROUGH	Breaking through learned helplessness
HELPLESSNESS	FLOURISHING	Flourishing emerging from helplessness
DISSOCIATION	PRESENCE	Presence countering dissociative patterns
DISSOCIATION	AUTHENTICITY	Authentic reconnection from dissociation
RAGE_GUILT	EMOTIONAL_MASTERY	Mastery developing over rage-guilt cycle
RAGE_GUILT	EQUANIMITY	Equanimity replacing rage-guilt oscillation
MANIC_DEFENSE	WISDOM	Wisdom replacing manic defensive patterns
MANIC_DEFENSE	SERENITY	Serenity grounding manic defense
NARCISSISTIC	AUTHENTICITY	Authentic expression replacing narcissistic patterns
NARCISSISTIC	WISDOM	Wisdom transcending narcissistic wound cycle
PASSIVE_AGGRESSIVE	AUTHENTICITY	Authentic expression replacing passive-aggression
PASSIVE_AGGRESSIVE	EMOTIONAL_MASTERY	Direct emotional mastery replacing indirect expression

PERFECTIONISM	CREATIVE_FLOW	Creative flow releasing perfectionist rigidity
PERFECTIONISM	FLOURISHING	Flourishing beyond perfectionist constraints
AVOIDANCE	PRESENCE	Presence overcoming avoidant withdrawal
AVOIDANCE	SECURE_ATTACHMENT	Secure attachment replacing avoidant patterns
RUMINATION	MINDFULNESS	Mindfulness interrupting obsessive rumination
RUMINATION	CREATIVE_FLOW	Creative flow redirecting ruminative energy

S4.2 Cross-Reference Significance

Compound cross-references carry special weight in the phase determination. When both a pathology compound and a pattern compound co-occur, the analyzer shifts the phase from CONFLICTED to RECOVERING — the co-occurrence of matched clinical-wellness compounds indicates meaningful processing rather than mere coexistence of opposing signals.

S5. Narrative Generation

S5.1 Narrative Structure

The analyzer builds a multi-sentence narrative from four components:

1. **Phase description** — opening statement based on the trajectory phase, incorporating dominant pathology and pattern families.
2. **Active dynamics** — significant and critical interaction signals, described in natural language.
3. **Compound interactions** — any compound cross-references detected.
4. **Trajectory direction** — net balance translated to a directional label with MBTI calibration note.

S5.2 Example Narratives

CRISIS phase:

"In emotional crisis driven by descent pathology with no significant positive patterns emerging. Overall trajectory: strongly negative (INTP-calibrated)."

RECOVERING phase with cross-references:

"Recovering — resilience patterns emerging against residual descent pathology. Active dynamics: active recovery from emotional descent; stabilizing forces against emotional oscillation. Compound interaction: healing from depressive trajectory. Overall trajectory: positive (ENFJ-calibrated)."

CONFLICTED phase:

"In emotional conflict — significant oscillation pathology coexisting with stability patterns in active tension. Active dynamics: stabilizing forces against emotional oscillation; emerging regulation of oscillating states. Overall trajectory: balanced (ISFP-calibrated)."

THRIVING phase:

"Thriving with dominant flow patterns and no pathological concern. Overall trajectory: strongly positive (ENTJ-calibrated)."

GROWING phase with mild traces:

"Growing emotionally with strong engagement patterns despite mild disconnect traces. Overall trajectory: positive (INFP-calibrated)."

S5.3 Direction Labels

Net Balance	Label
+3 to +4	Strongly positive
+1 to +2	Positive
0	Balanced
-1 to -2	Negative
-3 to -4	Strongly negative

S6. Output Structure — TrajectoryAnalysisResult.java

S6.1 Fields

```
public class TrajectoryAnalysisResult implements Serializable {
    private final int phase; // 0-6 trajectory phase
    private final int netBalance; // -4 to +4
    private final String narrative; // generated natural language
    private final String mbtiType;
    private final int pathologySeverity; // from PathologyResult
    private final int patternStrength; // from EmotionPatternResult
    private final String dominantPathologyFamily;
    private final String dominantPatternFamily;
    private final ArrayList<InteractionSignal> interactions;
    private final ArrayList<CompoundCrossRef> compoundCrossRefs;
}
```

S6.2 InteractionSignal

Each interaction records: - **signalId**: Prefixed identifier — OPP- (opposing), RNF- (reinforcing), or UNC- (uncontested). - **description**: Human-readable interaction description. - **pathologyFamily**: The pathology family involved (null for pattern-only signals). - **emotionFamily**: The emotion pattern family involved (null for uncontested pathology). - **significance**: NOTABLE (1), SIGNIFICANT (2), or CRITICAL (3).

S6.3 CompoundCrossRef

Each cross-reference records: - **pathologyTag**: The pathology compound tag (e.g. "DEPRESSION"). - **patternTag**: The pattern compound tag (e.g. "HEALING"). - **description**: The cross-reference narrative (e.g. "Healing from depressive trajectory").

S7. Integration with NeonAffectAgent

S7.1 New Field and Methods

```

private TrajectoryAnalysisResult lastTrajectoryAnalysis = null;

public TrajectoryAnalysisResult AnalyzeTrajectory() {
    lastTrajectoryAnalysis = EmotionalTrajectoryAnalyzer.Analyze(
        lastPathologyResult, lastEmotionPatternResult);
    return lastTrajectoryAnalysis;
}

public TrajectoryAnalysisResult GetLastTrajectoryAnalysis() {
    return lastTrajectoryAnalysis;
}

```

S7.2 Automatic Invocation

AnalyzeTrajectory() is called immediately after both detectors complete in all three emotion addition methods:

```

DetectPathology();
DetectEmotionPatterns();
AnalyzeTrajectory();

```

S7.3 Complete Data Flow

```

LevelCursorPlan
→ AddAffectHistoryEvent
→ AffectHistory beliefset updated
→ emotionMutex.release()
→ DetectPathology() → PathologyResult
→ DetectEmotionPatterns() → EmotionPatternResult
→ AnalyzeTrajectory() → TrajectoryAnalysisResult

```

The three-layer cascade runs synchronously after every emotion addition. Any plan or agent can access all three results at any time via the getter methods.

S8. Psychological Framework Analysis

The trajectory analyzer's phase model, interaction signals, and compound cross-references map onto several major psychological frameworks. This section examines how each framework's core constructs are represented — implicitly or explicitly — in the Neon-Affect analytical layer.

S8.1 Freudian Structural Model (Sigmund Freud, 1923)

Freud's tripartite model of the psyche — **Id**, **Ego**, and **Superego** — maps onto the interplay between pathology and emotion pattern families:

Freudian Construct	Neon-Affect Representation
Id (instinctual drives, pleasure principle)	ERUPTION pathology family — unregulated emotional discharge. INTENSITY family — raw arousal amplitude. The Id's demand for immediate expression appears when ERUPTION motifs fire without REGULATION counterbalance.
Ego (reality principle, mediator)	REGULATION and STABILITY families — successful mediation between impulse and context. The trajectory phase STABLE represents ego-dominant functioning. The opposing pair ERUPTION/REGULATION directly models the ego's containment of id impulses.
Superego (moral conscience, internalized standards)	FIXATION pathology — rigid adherence to internalized rules. PERFECTIONISM compound — the superego's demand for impossibly high standards. The SELF_ATK emotion category captures superego-driven self-punishment.

Defense mechanisms in Freudian theory map to specific pathology-pattern interactions:

Defense Mechanism	Neon-Affect Signal
Repression	DISCONNECT pathology + absence of INTEGRATION patterns — emotions pushed from awareness

Sublimation	ERUPTION + CREATIVE_FLOW cross-reference — drive energy redirected into creative engagement
Reaction formation	FIXATION + STABILITY reinforcing pair — the warning that apparent stability may mask fixation
Projection	SHADOW category + OTHER_ATK category co-occurrence in affect history
Regression	DESCENT pathology with high inertia — falling back to earlier emotional states and staying there
Rationalization	DISCONNECT + COMPLEXITY reinforcing pair — intellectual processing replacing emotional engagement

The trajectory phase **CONFLICTED** directly models Freud's concept of **intrapsychic conflict** — the simultaneous presence of opposing forces (id vs. ego, or ego vs. superego) that creates psychological tension without resolution.

S8.2 Jungian Analytical Psychology (Carl Jung, 1921-1961)

Jung's framework is the most deeply embedded in Neon-Affect, since the entire system is calibrated against MBTI types derived from Jungian cognitive function theory.

Jungian Construct	Neon-Affect Representation
Shadow	The SHADOW emotion category (EmotionCategory constant) captures controlling, aggressive, and arrogant states. The INTEGRATION family's H06 motif ("Shadow integration processing") explicitly detects shadow-to-positive transitions. The TRANSFORMATION compound (I04 + H06 + T02) represents successful shadow integration.

Individuation	The trajectory phase progression CRISIS → STRUGGLING → RECOVERING → GROWING → THRIVING models Jung's individuation process — the gradual integration of unconscious material into conscious wholeness. The WISDOM compound (I06 + K08 + H01) represents mature individuation.
Inferior function grip	The pathology detector's tier 2 routing includes explicit grip state detection via <code>MBTIBaseLines.GetInferiorFunction()</code> . Each cognitive function has specific dynamics signatures that indicate grip: Fe-inferior shows negative valence asymmetry, Se-inferior shows trigger sensitivity, Ni-inferior shows excessive attractor strength.
Enantiodromia	Jung's principle that extremes transform into their opposite is captured by the TRANSITION family — particularly T01 (positive valence reversal) and T02 (negative valence reversal). The compound cross-reference MANIC_DEFENSE/WISDOM represents enantiodromia at the compound level.
Persona vs. Self	The AUTHENTICITY compound (G07 + K04 + L01) represents the Self emerging through genuine expression. The NARCISSISTIC pathology compound represents persona-inflation — over-identification with the social mask. The cross-reference NARCISSISTIC/AUTHENTICITY captures the transition from persona to Self.
Archetypes	The compound patterns themselves function as archetypal emotional configurations: HEALING (the Wounded Healer), TRANSFORMATION (Death-Rebirth), WISDOM (the Sage), FLOURISHING (the Divine Child), SECURE_ATTACHMENT (the Great Mother).

Jung's concept of the **transcendent function** — the psyche's capacity to hold opposites in tension until a new synthesis emerges — is precisely what the CONFLICTED → RECOVERING phase transition models. The agent holds both pathology and positive patterns simultaneously until compound cross-references indicate integration.

S8.3 Maslow's Hierarchy of Needs (Abraham Maslow, 1943-1970)

Maslow's hierarchy maps directly onto the trajectory phases:

Maslow Level	Trajectory Phase	Pattern Families Active
Physiological/Safety	CRISIS	No positive patterns; survival-level emotional distress
Safety/Security	STRUGGLING	Faint REGULATION or STABILITY emerging — basic emotional safety being established
Love/Belonging	RECOVERING	BONDING and ENGAGEMENT families active — social-emotional needs being met
Esteem	GROWING	GROWTH, RESILIENCE, FLEXIBILITY — self-efficacy and confidence in emotional competence
Self-actualization	THRIVING	FLOW, INTEGRATION, COMPLEXITY — full emotional repertoire engaged
Transcendence	THRIVING + PEAK_EXPERIENCE compound	W06 + Y03 + A03 — Maslow's peak experience explicitly modeled

Maslow's later work on **peak experiences** — moments of highest happiness and fulfillment — is directly represented by the PEAK_EXPERIENCE compound pattern (P11). The motifs that compose it (sustained peak flow, sustained high positive intensity, strong to peak positive climb) capture exactly the emotional signature Maslow described: complete absorption, loss of self-consciousness, and feelings of perfection.

The trajectory analyzer's THRIVING phase with PEAK_EXPERIENCE compound and no pathology represents Maslow's fully self-actualized individual — rare, but detectable.

S8.4 Attachment Theory (John Bowlby, 1958; Mary Ainsworth, 1970)

Bowlby's attachment styles map onto specific pathology-pattern combinations:

Attachment Style	Pathology Signals	Pattern Signals	Trajectory
Secure	None or mild	BONDING, STABILITY, SECURE_ATTACHMENT compound	GROWING or THRIVING
Anxious-preoccupied	OSCILLATION (anxiety-relief cycle 005), ANXIETY compound	BONDING present but unstable, ENGAGEMENT without STABILITY	CONFLICTED
Dismissive-avoidant	DISCONNECT, AVOIDANCE compound	FLOW without BONDING (selective engagement), possible STABILITY (false independence)	STRUGGLING with DISCONNECT/FLOW reinforcing pair
Fearful-avoidant (disorganized)	OSCILLATION + DISCONNECT co-occurrence, BORDERLINE compound	Sporadic BONDING interrupted by withdrawal	CRISIS or CONFLICTED

The compound cross-references are particularly rich for attachment theory: - **BORDERLINE/SECURE_ATTACHMENT** — the paradox of forming secure bonds despite borderline instability, representing earned security. - **AVOIDANCE/SECURE_ATTACHMENT** — avoidant patterns being replaced by secure attachment, the core goal of attachment-focused therapy. - **TRAUMA/TRANSFORMATION** — post-traumatic growth in relational context.

Ainsworth's concept of the **secure base** is modeled by the STABILITY family's S02 motif (sustained mild positive contentment) combined with BONDING motifs — the emotional signature of felt security from which exploration can proceed.

S8.5 Person-Centered Theory (Carl Rogers, 1951-1961)

Rogers' three core conditions for therapeutic change map onto specific analyzer outputs:

Rogerian Construct	Neon-Affect Representation
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Unconditional positive regard	The BONDING family's N02 motif ("Vulnerability shared, positive received") — the agent shares shadow states and receives positive response. The SECURE_ATTACHMENT compound represents the internalized experience of unconditional acceptance.
Congruence (genuineness)	The AUTHENTICITY compound (G07 + K04 + L01) — genuine emotional expression combining authentic varied expression, mixed valence exploration, and varied positive states. Incongruence appears as DISCONNECT pathology + COMPLEXITY patterns (intellectualizing rather than experiencing).
Empathic understanding	The CONTAGION family's Q01 motif ("Single emotion broadening") and the BONDING family's N08 ("Empathic mirroring") — emotional resonance patterns.

Rogers' concept of the **fully functioning person** — open to experience, living existentially, trusting organismic feelings — corresponds to the THRIVING phase with high FLEXIBILITY, AUTHENTICITY, and PRESENCE compounds active. The trajectory progression from CRISIS through RECOVERING to THRIVING models Rogers' therapeutic arc.

The **organismic valuing process** — the innate tendency toward growth when conditions are right — is what the emotion pattern detector fundamentally measures. The 10 positive and growth families represent the directions of organismic valuing; the trajectory analyzer's ability to detect these patterns *emerging through* pathology (the RECOVERING phase) captures Rogers' belief that growth tendency persists even under distress.

S8.6 Cognitive Model (Aaron Beck, 1963-1979)

Beck's cognitive triad — negative views of self, world, and future — maps onto pathology compound patterns:

Cognitive Triad Element	Pathology Signal
Negative self-view	DEPRESSION compound (D02 + F01) — depressive spiral with deep negative fixation. SELF_ATTACK emotion category. PERFECTIONISM compound (D06 + F02) — failure to meet internalized standards.

Negative world-view	DISCONNECT pathology — withdrawal from engagement. AVOIDANCE compound (O05 + X06) — the world experienced as threatening.
Negative future-view	HELPLESSNESS compound (D01 + F03) — learned helplessness implying no expectation of change. DESCENT pathology without ASCENT counterbalance — trajectory perceived as only downward.

Beck's **cognitive distortions** appear as specific pathology-pattern interaction signatures:

Cognitive Distortion	Analyzer Signal
All-or-nothing thinking	OSCILLATION pathology with low COMPLEXITY — binary emotional states without nuance
Catastrophizing	ERUPTION pathology with high velocity + DESCENT — small triggers producing maximum negative response
Emotional reasoning	FIXATION pathology + uncontested signal — emotional state taken as evidence of reality
Overgeneralization	FIXATION + CONTAGION (negative spreading) — single negative experience generalizing across emotional dimensions
Mental filter	DISCONNECT + absence of FLEXIBILITY — selective attention to negative, filtering out positive

The trajectory analyzer's compound cross-references capture Beck's therapeutic process: DEPRESSION/BREAKTHROUGH represents cognitive restructuring succeeding; RUMINATION/MINDFULNESS represents metacognitive awareness interrupting automatic negative thoughts.

S8.7 Psychosocial Development (Erik Erikson, 1950-1982)

Erikson's eight stages of psychosocial development each produce a characteristic emotional signature when their central conflict is active:

Erikson Stage	Virtue	Pathology Signal (Negative Resolution)	Pattern Signal (Positive Resolution)
Trust vs. Mistrust	Hope	DISCONNECT, AVOIDANCE compound	BONDING, SECURE_ATTACHMENT compound
Autonomy vs. Shame	Will	DESCENT with SELF_ATK, PERFECTIONISM compound	REGULATION, EMOTIONAL_MASTERY compound
Initiative vs. Guilt	Purpose	ERUPTION + RAGE_GUILT compound	ENGAGEMENT, CREATIVE_FLOW compound
Industry vs. Inferiority	Competence	FIXATION + HELPLESSNESS compound	GROWTH, FLOURISHING compound
Identity vs. Role Confusion	Fidelity	OSCILLATION + DISCONNECT co-occurrence	INTEGRATION, AUTHENTICITY compound
Intimacy vs. Isolation	Love	DISCONNECT + AVOIDANCE	BONDING, PRESENCE compound
Generativity vs. Stagnation	Care	FIXATION (neutral flatline F04)	GROWTH + ENGAGEMENT, WISDOM compound
Integrity vs. Despair	Wisdom	DESCENT + DEPRESSION compound	INTEGRATION, EQUANIMITY, SERENITY compounds

The trajectory analyzer's phase model captures Erikson's **epigenetic principle** — the idea that each stage builds on successful resolution of the previous one. The CRISIS → STRUGGLING → RECOVERING → GROWING → THRIVING progression mirrors the cumulative nature of psychosocial development. An agent in the THRIVING phase with WISDOM and EQUANIMITY compounds active has, in Eriksonian terms, achieved ego integrity.

S8.8 Stages of Grief (Elisabeth Kubler-Ross, 1969)

Kubler-Ross's five stages of grief map onto specific temporal sequences in the affect history that the trajectory analyzer can identify through the interaction of pathology and pattern detectors:

Grief Stage	Pathology Signal	Pattern Signal	Trajectory Phase
Denial	DISCONNECT pathology — emotional numbing (X05), disengagement (X06)	Absence of INTEGRATION patterns	STRUGGLING
Anger	ERUPTION pathology — explosive outburst (E01), rage surge (E03)	Possible INTENSITY patterns (energy present but misdirected)	STRUGGLING or CRISIS
Bargaining	OSCILLATION — anxiety-relief cycle (O05), hope-crash oscillation	ASCENT motifs appearing intermittently then failing	CONFLICTED
Depression	DESCENT + FIXATION — depressive spiral (C01 compound), deep negative fixation (F01)	Faint INTEGRATION motifs may emerge (I02: grief processing)	CRISIS or STRUGGLING
Acceptance	Pathology receding (severity dropping)	INTEGRATION dominant — I02 (grief processing to acceptance), I07 (negative processed to acceptance)	RECOVERING → GROWING

The trajectory analyzer captures the non-linear nature of grief that Kubler-Ross later emphasized — individuals do not progress through stages sequentially. The CONFLICTED phase, where pathology and positive patterns coexist in tension, models the reality that grief involves cycling between stages. The compound cross-reference TRAUMA/HEALING represents the completion of the grief process — the emergence of meaning and renewal from loss.

S8.9 Cross-Framework Synthesis

The Neon-Affect trajectory analyzer is not built on any single psychological framework — it is an empirical pattern-matching system that detects emotional trajectories from observed data. However, the mapping exercise reveals that the system's constructs converge with multiple theoretical frameworks simultaneously:

Neon-Affect Construct	Freud	Jung	Maslow	Bowlby	Rogers	Beck	Erikson
CRISIS phase	Overwhelming anxiety	Shadow possession	Safety needs unmet	Disorganized attachment	Conditions of worth violated	Cognitive triad fully negative	Stage crisis (negative)
RECOVERING phase	Ego strengthening	Transcendent function	Belonging needs being met	Earning security	Growth tendency emerging	Cognitive restructuring	Reworking a stage
THRIVING phase	Ego-syntonic functioning	Individuation	Self-actualization	Secure attachment	Fully functioning person	Adaptive cognition	Ego integrity
Opposing signals	Intrapsychic conflict	Tension of opposites	Need frustration vs. satisfaction	Attachment anxiety	Incongruence	Cognitive dissonance	Stage conflict
Compound cross-refs	Successful defense resolution	Shadow integration	Need transcendence	Earned security	Therapeutic movement	Schema modification	Virtue acquisition
Narrative generation	Interpretation	Amplification	Growth narrative	Internal working model	Phenomenological description	Case conceptualization	Life narrative

This convergence is not coincidental. The 20 pathology and pattern families were designed to capture fundamental emotional dynamics — descent and ascent, fixation and flexibility, eruption and regulation, disconnection and engagement. These dynamics are precisely what the major psychological frameworks theorize about, each from its own perspective. The trajectory analyzer's ability to detect the *interaction* between pathological and healthy dynamics, and to classify the resulting state into a meaningful phase, provides a computational analog to clinical case conceptualization.

S9. Summary

S9.1 New Data Classes

Class	Key Fields	Purpose
TrajectoryAnalysisResult	phase, netBalance, narrative, interactions, crossRefs	Complete trajectory analysis output
EmotionalTrajectoryAnalyzer	static analysis tables, narrative builder	Unified analysis engine

S9.2 Analysis Coverage

Component	Count	Description
Trajectory phases	7	CRISIS through THRIVING
Opposing pairs	10	Pathology-pattern family counterbalances
Reinforcing pairs	5	Subtler pathology-pattern interactions
Compound cross-references	32	Clinical-wellness compound co-occurrences
Significance levels	3	NOTABLE, SIGNIFICANT, CRITICAL
Net balance range	9	-4 to +4

S9.3 Complete System Architecture

With the trajectory analyzer, the full analytical pipeline comprises:

Layer	Classes	Inputs	Outputs
Foundation	EmotionCategory, AffectDynamicsCalculator, AffectDynamicsParams, MBTIBaselines	Raw affect history	15 categories, 20 dynamics parameters, 16 type baselines
Pathology Detection	PathologyMotif, PathologyMotifLibrary, PathologyDetector, PathologyResult	Categories + dynamics	40 motifs, 15 compounds, severity 0-4, tier 2 route
Emotion Pattern Detection	EmotionPatternMotif, EmotionPatternLibrary, EmotionPatternDetector, EmotionPatternResult	Categories + dynamics	120 motifs, 15 compounds, strength 0-4, dominant family
Trajectory Analysis	EmotionalTrajectoryAnalyzer, TrajectoryAnalysisResult	Both detector results	Phase, interactions, cross-refs, narrative, net balance

Total: **14 classes**, **160 motifs**, **30 compounds**, **32 cross-references**, **7 phases**, running automatically after every emotion addition.

S10. Conclusions

The Emotional Trajectory Analyzer represents the culmination of the Neon-Affect analytical layer. Several aspects merit reflection:

Emergent clinical relevance: The compound cross-reference table was designed empirically — matching pathology compounds to the pattern compounds that would represent recovery from each condition. Yet the resulting pairings align precisely with established therapeutic approaches: RUMINATION/MINDFULNESS reflects Mindfulness-Based Cognitive Therapy (MBCT), TRAUMA/TRANSFORMATION reflects Post-Traumatic Growth theory, BORDERLINE/EMOTIONAL_MASTERY reflects Dialectical Behavior Therapy (DBT), and AVOIDANCE/SECURE_ATTACHMENT reflects attachment-focused therapy.

Framework convergence: The psychological framework analysis in Section S8 demonstrates that the system's constructs are not arbitrary. The trajectory phases, interaction signals, and compound patterns map consistently across Freudian, Jungian, Maslovian, attachment, person-centered,

cognitive, developmental, and grief frameworks. This convergence suggests that the underlying emotional dynamics the system detects are fundamental rather than framework-specific.

Narrative as interface: The generated narrative provides a human-readable summary that any plan or agent can use without understanding the underlying motif mechanics. An agent receiving "Recovering — resilience patterns emerging against residual descent pathology" can make behavior decisions without parsing motif IDs or severity scores. This bridges the gap between computational pattern detection and meaningful psychological description.

Phase as behavior selector: The trajectory phase provides a direct signal for JACK plan competition. A plan relevant to CRISIS can declare a higher context condition when phase == 0 than when phase == 6. This enables the agent to select contextually appropriate behaviors — supportive and containing during crisis, exploratory and growth-oriented during thriving — without external LLM calls.

Layered independence: Each analytical layer can evolve independently. New motifs can be added to either detector without affecting the trajectory analyzer. New cross-references can be added to the analyzer without modifying the detectors. The foundation classes serve all three layers without awareness of how they are used. This architecture supports incremental refinement as the system's understanding of emotional dynamics deepens.

The Neon-Affect system now provides a computational model of emotional trajectory that is grounded in pattern detection, calibrated to personality type, and interpretable through the lens of major psychological frameworks — from Freud's structural model to Maslow's self-actualization, from Bowlby's attachment theory to Beck's cognitive model. The trajectory analyzer transforms raw affect history into meaningful psychological narrative, closing the loop between emotional observation and clinical understanding.

This supplement was generated from direct source code analysis of the tenbase2-com-LLC/Neon-Affect repository. All code excerpts are taken directly from the repository source files.