

Quaternionic Cognitive Geometry: A 24-Cell Model of Mindsets, Transitions, and Personality Dynamics

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Abstract: We propose a geometric model of cognition based on a simple dialectical structure: Thesis (T), Antithesis (A), Action (Ac; $T \rightarrow A$), and Reflection (Re; $A \rightarrow T$), corresponding to four classical temperaments and four independent dimensions. Each dimension spans constructive (+) to destructive/exaggerated (−) expression, yielding eight temperamental vertices ($T_{\pm}$, $Ac_{\pm}$, $A_{\pm}$, $Re_{\pm}$) of a 4D cross-polytope. Their combinations generate 16 hypercube vertices representing affective states. Together, the cross-polytope and hypercube form the 24-cell, whose 24 octahedral cells are interpreted as distinct mindsets. Sixteen cells correspond to conventional personality configurations related to MBTI-like typologies, whereas eight non-conventional mindsets combine normally separated personality poles. Cognitive dynamics can therefore be represented as trajectories through the 24-cell: synthesis requires specific sequences of mindsets, while systematically avoiding particular states produces restrictive habits and maladaptive schemas. The conventional mindsets form two complementary strands whose limitations are compensated through non-conventional states, making emotional maturation interpretable as increasing access to these compensatory pathways. The model further associates selected non-conventional states with radical honesty, intuition, and non-local information processing, while combinations of mindsets can be interpreted as pulsating transmitters and receivers, providing a geometric rationale for concepts such as Morphic Resonance. Overall, the 24-cell provides a periodic-table-like framework for organizing psychic states and, importantly, their transitions. Extension from four temperamental to four higher-order personality dimensions yields an 8D E8 structure containing 240 affective-state vertices, 10 disjoint 24-cells (personas), 3,150 embedded D4 root subsystems (situational roles), and over a million lower-dimensional faces and volumes (higher-order mental states and interaction patterns).

Keywords: Dialectical cognition; quaternionic geometry; 24-cell; personality dynamics; cognitive flexibility; psychopathology

1. INTRODUCTION

Behavioral science consists of isolated micro-theories lacking a shared theoretical foundation (Muthukrishna & Henrich, 2019). Psychology, psychiatry, neuroscience, and consciousness studies therefore tend to operate independently. We propose a simple geometrical framework based on Structured Dialectics in 4-dimensional quaternionic space to integrate these domains. Structured Dialectics assumes that every phenomenon arises from the synthesis of opposing tendencies. While the simplest dialectical opposition can be represented as rotation on the complex plane ([Reference](#)), explicit representation of the intermediate action and reflection steps requires four components and therefore lifts the model into 4D quaternionic space.

Here, the four dialectical components are associated with the classical temperaments (Fig. 1A), each represented as a bipolar semantic differential comprising constructive (+) and exaggerated (−) forms. These components define four quaternionic axes whose eight endpoints form the vertices of the 16-cell (4D cross-polytope; Fig. 1B). Their combinations generate sixteen higher-order states represented by the vertices of the hypercube (Fig. 1C). Together, the 16-cell and hypercube form the 24-cell that describes the dynamics of both personal development and degradation traps.

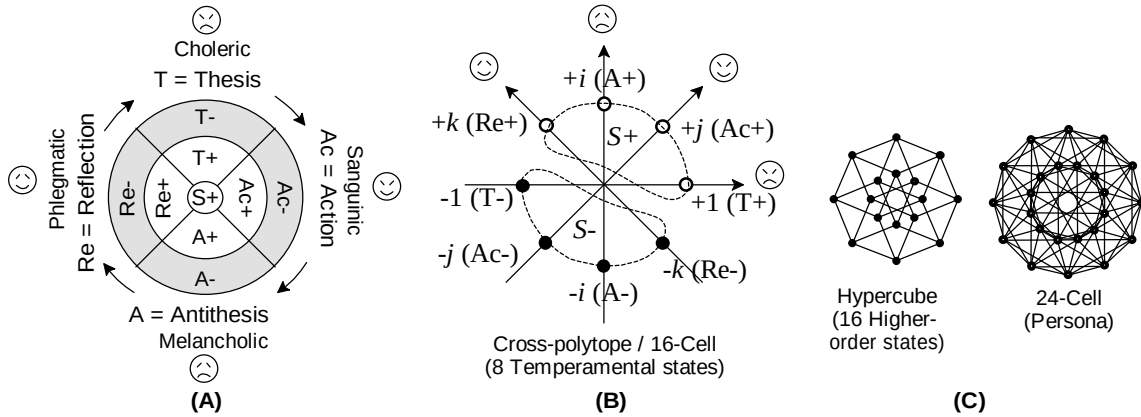


Fig. 1. The 4 elements define 24-Cell

In the proposed interpretation, the 24 octahedral cells correspond to mental states, the 96 triangular faces to behavioral schemas, and the 96 edges to psychological triggers and transitions. This provides the basis for describing personality traits, psychopathology,

and higher states of consciousness within a single theoretical framework. We propose that every state serves a natural adaptive function, provided cognition moves dynamically through quaternionic space (Fig. 1B, S+ and S− loops). Dysfunction arises when these dynamics become desynchronized. We first analyze the static geometry of the framework before returning to the rotational dynamics that govern transitions between states.

2. QUATERNIONIC REPRESENTATION

2.1 Quaternionic Axes and Dialectical Components

Table 1 provides starting definitions that unite existential philosophy with classic temperaments.

Table 1. Dialectical Interpretation of Quaternion Components

	DC	Dialectical Role	Function	Example	Temperament
+1	T+	Constructive Thesis	Vision (“light”)	Order	Choleric +
-1	T-	Exaggerated Thesis	Risk (“demon”)	Blindness	Choleric –
+i	A+	Constructive Antithesis	Obligation (“angel”)	Awareness	Melancholic +
-i	A-	Exaggerated Antithesis	Threat (“shadow”)	Chaos	Melancholic –
+j	Ac+	Constructive Action	Exploration	Learn	Sanguine +
-j	Ac-	Exaggerated Action	Escalation	Overact	Sanguine –
+k	Re+	Constructive Reflection	Integration	Create	Phlegmatic +
-k	Re-	Exaggerated Reflection	Closure	Ignore	Phlegmatic –
0	S+	Synthesis	Emergence	Wisdom	Homeostasis

Thesis is what we manifest. It varies from T+ – our subtle goal or a “light” that makes us move, to T- – our “demon” that exaggerates our light, making it burn like fire. This variation manifests as choleric temperament, that can also vary from subtle expressions to “active burning”.

Antithesis is our potential. It varies from A+ – our subtle obligation or “angel” that semantically contradicts to “demon” T-, to A- – our “shadow” that semantically

contradicts to the “light” T+. This manifests as melancholy that can vary from calm awareness to sadness, draining, and depressiveion.

Action is what turns thesis into antithesis, varying from Exploration (Ac+) to Escalation (Ac-). This corresponds to Sanguine that varies from sensitive pragmatism to cold disruption. Reflection is what turns antithesis into thesis, varying from Integration (Re+) to Suffocation (Re-). This corresponds to Phlegmatism that varies from flexible adaptation to apathy / indifference.

Remarkably, the proposed psychological interpretation is compatible with quaternionic noncommutativity (Table 2). Here, multiplication denotes ordered composition: $X \cdot Y$ describes Y operating under the condition established by X. Thus, quaternionic noncommutativity can acquire a dialectical interpretation: the same two constructive components can produce either balanced or exaggerated outcomes depending on their order of composition.

Table 2. Dialectical Interpretation of Quaternion products

Product	Dialectical interpretation	Explanation
$i \cdot j = k$	Obligation $\times$ Exploration $\rightarrow$ Integration	Obligation guides Exploration toward Integration
$j \cdot i = -k$	Exploration $\times$ Obligation $\rightarrow$ Closure	Exploration guides Obligation toward Closure
$i \cdot k = -j$	Obligation $\times$ Integration $\rightarrow$ Escalation	Obligation guides Integration toward Escalation
$k \cdot i = j$	Integration $\times$ Obligation $\rightarrow$ Exploration	Integration guides Obligation toward Exploration
$k \cdot j = -i$	Integration $\times$ Exploration $\rightarrow$ Threat	Integration guides Exploration toward Threat
$j \cdot k = i$	Exploration $\times$ Integration $\rightarrow$ Obligation	Exploration guides Integration toward Obligation

2.2 Relation to Personality Psychology

This section considers empirical relations for the sake of simpler interpretations. Those interested only in the geometric side of the model may skip to the following section 3 (Cross-polytope coordinates).

Temperaments are more fundamental than character traits and cognitive schemes (Rothbart & Bates, 2006) and can be viewed as building blocks of personality traits and cognitive schemes. Fig. 2A shows a simplified variant of such development

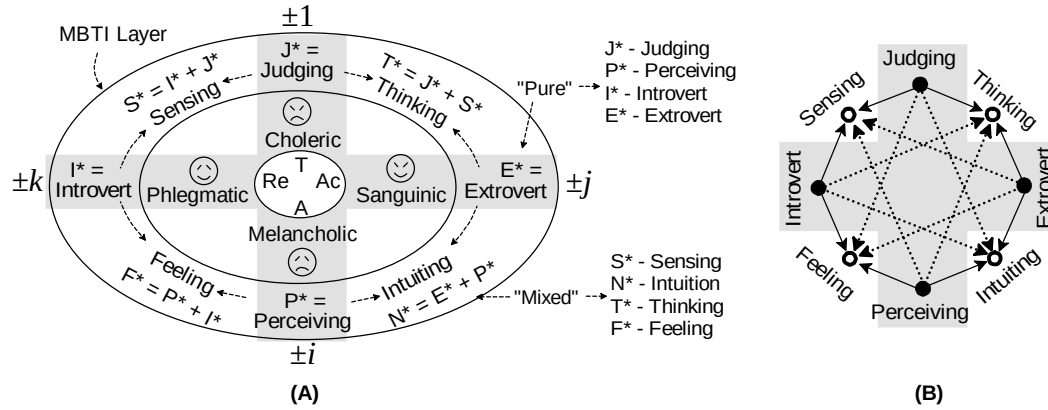


Fig. 2. The 4 elements give rise to another 4 elements, yielding MBTI classification

Here we consider MBTI traits, because of their inherent bipolar structure. Each trait can be both positive (balanced, constructive) or negative (exaggerated, destructive), as shown in Table 3. Similar considerations apply to the Big Five traits, although with additional limitations (see footnote to Table 3).

Table 3. Relation of dialectical components to personality traits

DC	Temperament	MBTI Poles	Positive	Negative	Big 5*
T $\pm$	Choleric	Judging (J*)	Discernment	Dogmatism	Conscientious
A $\pm$	Melancholic	Perceiving (P*)	Receptivity	Diffusion	Openness
Ac $\pm$	Sanguine	Extrovert (E*)	Engagement	Impulsivity	Extrovert
Re $\pm$	Phlegmatic	Introvert (I*)	Reflection	Withdrawal	Stability/Neuroticism
T+/Ac+	Positive E+J	Thinking (T*)	Reasoning	Reductionism	Industriousness**
T+/Re+	Positive I+J	Sensing (S*)	Awareness	Literalism	Orderliness**
A+/Ac+	Positive E+P	Intuiting (N*)	Imagination	Delusion	Openness
A+/Re+	Positive I+P	Feeling (F*)	Empathy	Sentimentality	Agreeableness

*Here and below MBTI poles will be denoted by an asterisk, to distinguish them from other dialectical components.

**The Big Five conflates the absence of X with the presence of its opposite (e.g., low Extraversion = high Introversion), as if the absence of activity automatically implied the presence of reflectivity. This violates the dialectical law ($T + A = S$), so the missing concepts were approximated using less recognized constructs.

MBTI uses four dichotomous pairs, two of which can be viewed as "pure" extensions of the classical temperaments, whereas the other two represent their "mixed" combinations. These assumptions are supported by the semantic analyses summarized in

the Supplementary Material. There we show that the four pure MBTI poles (I*/E*, J*/P*) are semantically very close to the corresponding dialectical components in both their constructive and exaggerated forms, whereas the remaining four poles (S*/N*, T*/F*) emerge as combinations of the first four. For example, Thinking (T*) remains constructive (Reasoning) only when both Judging (J*) and Extraversion (E*) are constructive (Discernment and Engagement, respectively). If either Judging degrades into Dogmatism or Extraversion into Impulsivity, Thinking likewise degrades into Reductionism.

More generally, each "pure" personality trait may be represented as a weighted combination of the four fundamental temperaments:

$$X_{\text{Pure}^+} = \sum (a_{xi} \text{ Temper}_i), \text{ over all } i = 1 - 4 \quad (1)$$

This implies that the coarse temperamental functions give rise to the more specialized "pure" personality traits. These, in turn, combine to produce the "mixed" personality traits (Fig. 2B):

$$Y_{\text{Mixed}} = \sum (b_{xi} X_{\text{Pure}^+i}), \text{ over all } i = 1 - 4 \quad (2)$$

From a computational perspective, one may also consider a combination of all eight dialectical components, providing finer semantic resolution but losing the conceptually important process of dialectical synthesis:

$$X_{\text{Any}} = \sum (w_{xi} DC_{\pm i}), \text{ over all } i = 1 - 8 \quad (3)$$

In all expressions, the weights represent the strength of association between the temperamental vertices of the cross-polytope and the higher-order personality components of the hypercube. Different weight distributions produce individual personality differences, so that even the same personality trait (e.g., Extraversion) may emerge differently in each individual. Over time, these higher-order traits may become independent of their parental temperamental poles, much as habits gradually become independent of the short-term impulses from which they originated (see Discussion).

Interestingly, eq. (3) formally describes the “strength” of each hypercube’s vertex formed by the unique combination of the 4 DCs. However, this does not mean that each

hypercube's vertex corresponds to a unique MBTI pole, because some vertices involve mostly negative components, while others mostly positive.

3. 24-CELL CONSTRUCTION

3.1 Temperamental States as Cross-Polytope Vertices

All vertices on quaternion axes form 4D Cross-polytope (Table 4). Each vertex can be interpreted in a variety of ways.

Table 4. Dialectical Cross-Polytope (16-cell or 4D Octahedron).

N	16-cell Vertex	DC ^{a)}	Dialectical	Subjective ^{b)}	Neurocognitive ^{c)}	MBTI ^{d)}
1-1	(1, 0, 0, 0)	T+	Discernment	Clarity	Conceptualization	J*+ = Decisiveness
1-2	(-1, 0, 0, 0)	T-	Dogmatism	Conviction	Rigidity	J*- = Inflexibility
1-3	(0, 1, 0, 0)	A+	Awareness	Responsibility	Attunement	P*+ = Receptivity
1-4	(0, -1, 0, 0)	A-	Chaos	Anxiety	Hyper-vigilance	P*- = Diffusion
1-5	(0, 0, 1, 0)	Ac+	Learning	Curiosity	Exploration	E*+ = Engagement
1-6	(0, 0, -1, 0)	Ac-	Disruption	Urgency	Disinhibition	E*- = Impulsivity
1-7	(0, 0, 0, 1)	Re+	Reflection	Insight	Integration	I*+ = Introspection
1-8	(0, 0, 0, -1)	Re-	Hyper-reflection	Suffocation	Fixation	I*- = Isolation

^{a)}DC – Dialectical Component. ^{b)}See previous tables for more associations. ^{c)}Illustrative names that can overlap with hypercube labels. ^{d)}Only “pure” poles are listed; the “mixed” ones are in hypercube

3.2 Affective States as Hypercube Vertices

Cross-polytope can be viewed as a source of energy, while hypercube can be viewed as a way of increasing its subtlety and variety of temperamental manifestations. Hypercube has 16 vertices (vs 8 in cross-polytope), each of which combines 4 components (vs just one in cross-polytope; see Table 5).

Table 5. Dialectical Hypercube (taxonomy of states)

N	Polarity Combination	E C	Dialectical State	Subjective	Neurocognitive	MBTI
2-1	½ (T+; A+; Ac+; Re+)	0	Synthesis Threshold	Love	Integrative Cognition	S*, N*, T*, F*

2-2	½ (T+; A+; Ac+; Re-)	1	Hyper-Reflective	Confidence	Cognitive Consolidation	N*, T*
2-3	½ (T+; A+; Ac-; Re+)	1	Hyper-Active	Serenity	Reflective Control	S*, F*
2-4	½ (T+; A+; Ac-; Re-)	2	Rigid Idealism	Certainty	Cognitive Rigidity	---
2-5	½ (T+; A-; Ac+; Re+)	1	Persistent Inquiry	Wonder	Exploratory Processing	T*, S*
2-6	½ (T+; A-; Ac+; Re-)	2	Ruminative Orthodoxy	Zeal	Perseverative Processing	T*
2-7	½ (T+; A-; Ac-; Re+)	2	Reactive Retaliation	Caution	Vigilant Monitoring	S*
2-8	½ (T+; A-; Ac-; Re-)	3	Defensive Siege	Frustration	Defensive Inhibition	---
2-9	½ (T-; A+; Ac+; Re+)	1	Measured Reform	Fascination	Cognitive Flexibility	N*, F*
2-10	½ (T-; A+; Ac+; Re-)	2	Obsessive Innovation	Inspiration	Generative Processing	N*
2-11	½ (T-; A+; Ac-; Re+)	2	Wild Disruption	Compassion	Contextual Integration	F*
2-12	½ (T-; A+; Ac-; Re-)	3	Chaotic Overthrow	Uncertainty	Cognitive Instability	---
2-13	½ (T-; A-; Ac+; Re+)	2	Fragile Sanctuary	Excitement	Adaptive Switching	---
2-14	½ (T-; A-; Ac+; Re-)	3	Ruminative Exhaustion	Anxiety	Reactive Processing	---
2-15	½ (T-; A-; Ac-; Re+)	3	Reckless Panic	Terror	Cognitive Disengagement	---
2-16	½ (T-; A-; Ac-; Re-)	4	Total Meltdown, S- → Reset	Despair	Cognitive Decompensation	---

*Only “mixed” poles combining two vertices are considered.

A pole is present if both vertices are positive. dashes mean that only “pure” poles representing just one vertex (J/P, E/I) can be present.

For saving space, numeric coordinates were replaced with dialectical component symbols. Supplementary material provides all conventional coordinates with the lists of adjacent vertices.

Different vertices have different synthesis potential which can be measured by the number of exaggerated components (EC). The highest potential is assigned to the first vertex (2-1) with EC = 0. The lowest potential is assigned to the last vertex (2-16) with EC = 4. The actual synthesis is a dynamic process that occurs simultaneously on two planes (will be described separately), therefore each vertex represents only a temporary stage.

As mentioned above, the variable EC parameter makes it impossible to assign each vertex to a unique personality pole. Therefore, in Table 5 such assignments were made using the assumptions from Table 3 (e.g., Thinking (T*) assigned to T+A±Ac+Re±, while Sensing (S*) to T+A±Ac±Re+). The empirical verification suggests that ~2/3 of all assignments seem to be correct, while 1/3 may be questionable (see below). These

assignments however are only used for the interpretational clarity and they do not affect the models' major use.

Semantic labels were assigned by AI, based on the dialectical components rather than MBTI predictions. In some cases, the decision was not obvious. For instance, vertex (2-5: T+; A-; Ac+; Re+) implies a person who is open-minded and internally goal-oriented (T+) but overreactive to threats and trapped in criticism (A-), while still exploring (Ac+) and integrating (Re+). Gemini 3.5 assigned it to “Grounded Conservation”, while GPT-5 to “Persistent Inquiry”, although on surface these states look almost opposite. The major contradiction is between the Goal and Threat that we carry within us. The existing neurocognitive terminology is not rich enough to describe such states, therefore some labels from Tables 4 and 5 may overlap.

3.3 Integration into the 24-Cell

Fig. 3 shows 2D diagrams of the dialectical cross-polytope (A) and hypercube (B).

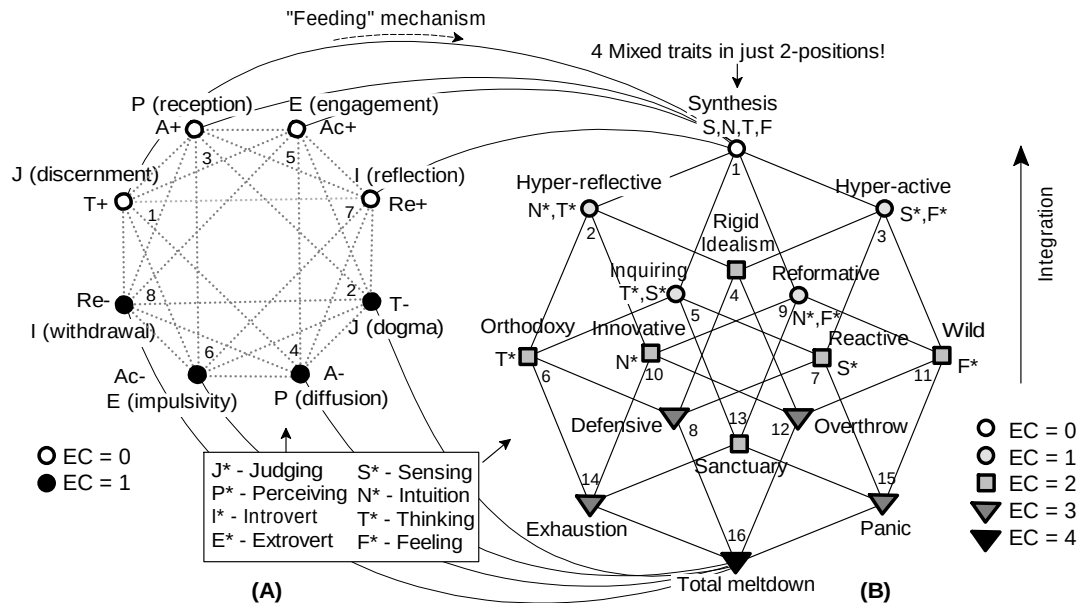


Fig. 3. Construction of 24-cell from 16-cell (cross-polytope) (A) and hypercube (B).

Each cross-polytope's vertex is connected to 8 hypercube's vertices, although shown are only 8 of 64 connections. Each hypercube's vertex from diagram B is connected to 4 vertices from diagram A, which ensures its temperamental substance.

When all connections are in place, the distinction between these two diagrams disappears, as all vertices become geometrically equivalent. Yet, psychologically we still differentiate them, because diagram A represents the more fundamental components than diagram B. Besides, these connections are of different strengths that can be modelled by the weights in eq. (1).

Cross-polytopes' temperaments are hardwired biologically, and controlled by physiology and stress. By contrast, hypercube's states can be consciously altered, although the ease of such alterations is highly individual.

Diagram B is depicted in a way that bottom part represents the most destructive affective states, while the top represents the most constructive ones. Climbing to the top implies gradual integration of personality traits. The exact middle layer includes only single letter poles (T^* , N^* , S^* , F^*). One step higher we have pairs of compatible poles (T^*/S^* , N^*/F^*). The next level includes pairs of incompatible poles (T^*/F^* , S^*/N^*), while the top vertex combines all of the mixed poles ($T^*/F^*/S^*/N^*$) in just one affective state.

Such integration is not represented within standard MBTI theory, which assumes a strict preference for either S^* or N^* , and either T^* or F^* , rather than their simultaneous expression. Yet, such states are well-documented in analytical and transpersonal psychology as the ultimate synthesis of mind. In Jungian terms, this reflects the realization of the Self through the transcendent function, where the artificial binary between Sensing/Intuition and Thinking/Feeling resolves into a unified Coincidentia Oppositorum (Jung, 1971; Assagioli, 1965). Transpersonal psychology similarly describes this as a "unitive" or "non-dual" state (Wilber, 1977), wherein non-discursive intuitive depth (N^*) and direct sensory presence (S^*) operate simultaneously, while structural clarity (T^*) is fully integrated with affective value (F^*). Thus, the top "Synthesis" node corresponds to a high-order state that lies beyond classical MBTI typology—a phenomenon that finds concrete empirical backing in non-ordinary states of consciousness (discussed below).

By contrast, falling to the bottom of diagram B is harmful because it progressively accumulates exaggerated dialectical components corresponding to psychiatric disorders.

We therefore tend to remain confined to the middle of diagram B, where dialectically incomplete states are praised as virtues. As mentioned earlier, no dialectical state is inherently negative, but it becomes such if we stop integrating it into larger cycles. Table 6 illustrates how such prolonged occupation may nevertheless receive positive mainstream labels.

Tale 6. Examples of negative states (EC = 2) labeled as positive

N	Dialectical State	Subjective	Neurocognitive	MBTI	Mainstream
2-6	Ruminative Orthodoxy	Zeal	Perseveration	T*	Moral Principle
2-7	Reactive Retaliation	Caution	Monitoring	S*	Protective Resolve
2-10	Obsessive Innovation	Inspiration	Generation	N*	Visionary Exploration
2-11	Wild Disruption	Compassion	Contextualization	F*	Courageous Change

The very fact of such fixations suggests that the curved connections between the diagrams A and B in Fig. 3 are not of equal strength. Stronger connections correspond to the larger weights in eqs. (1-3), determining our predispositions to certain vertices in hypercube. Mature personality has large values of many weights, enabling free movement depending on the situation. Immature person remains stuck, showing low emotional intelligence, and/or the lack of the “soft skills”.

3.4 Octahedral Cells as Mental Modes

The 24 vertices of the 24-cell form 24 octahedral cells that can be viewed as distinct mental states. Table 7 shows that each cell combines two dialectical components from the cross-polytope with four dialectical states from the hypercube, yielding distinct MBTI profiles. The two source poles constitute a coarse temperamental engine, whereas the hypercube poles represent its more specialized personality manifestations. This hierarchical organization enables modeling non-trivial psychodynamic situations, including administrative evil (Arendt, 1963; Adams & Balfour, 2009) and ethical compartmentalization, in which destructive temperamental tendencies are optimized by seemingly constructive personality patterns, or constructive temperaments are undermined through over-exploitation of their latent exaggerations.

Table 7. Theoretical mapping of octahedral cells to adaptive expressions and clinical analogues

Cell	Cross-polytope	E/C	Dialectical label	MBTI Types	Score	Typical Express.	Potential Problems
1A	T+ Discernment, A+ Awareness	0	Disciplined Awareness	S/N, T/F; J/P fused; E/I n/a	0.95	Synthesis	Ideological fixation
2A	T+ Discernment, A- Chaos	1	Ordered Crisis	ST only; J/P fused; E/I n/a	0.80	Practicality	Rigid perfectionism
3A	T- Dogmatism, A+ Awareness	1	Convicted Awareness	NF only; J/P fused; E/I n/a	0.70	Idealism	Wishful thinking
4A	T- Dogmatism, A- Chaos	2	Dogmatic Chaos	---		Crisis (Honesty?)*	Cognitive collapse (pangs of conscience)
5C	T+ Discernment, Ac+ Learning	0	Guided Learning	ESTJ, ENTJ	0.90	Exploration	Authoritarian; arrogance
6C	T+ Discernment, Ac- Overacting	1	Disciplined Overaction	ESFJ	0.70	Restructuring	Overcompliance
7C	T-, Dogmatism, Ac+ Learning	1	Dogmatic Learning	ENFJ	0.60	Inspiration	Grandiosity
8C	T- Dogmatism, Ac- Overacting	2	Dogmatic Overaction	ESFJ, ENFJ	0.55	Influence	Forceful persuasion
9B	T+ Discernment, Re+ Reflection	0	Reflective Discernment	ISTJ, ISFJ	0.95	Stability	Chronic rumination
10B	T+ Discernment, Re- Withdrawal	1	Hyper-reflective Discernment	INTJ	0.80	Strategy	Suspicious interpretation
11B	T- Dogmatism, Re+ Reflection	1	Reflective Dogmatism	INFJ	0.70	Vision	Mysticism
12B	T- Dogmatism, Re- Withdrawal	2	Hyper-reflective Dogmatism	INTJ, INFJ	0.75	Contemplation	Abstract detachment
13C	A+ Awareness, Ac+ Learning	0	Exploratory Awareness	ENTP, ENFP	0.95	Exploration	Distractibility
14C	A+ Awareness, Ac- Overaction	1	Contextual Overaction	ESFP	0.85	Spontaneity	Impulsive responding
15C	A- Chaos, Ac+ Learning	1	Exploratory Chaos	ESTP	0.75	Initiative	Reckless experimentation
16C	A- Chaos, Ac- Overaction	2	Chaotic Overaction	ESTP, ESFP	0.85	Intervention	Sensation seeking

17B	A+ Awareness, Re+ Reflection	0	Reflective Awareness	ISFP, INFP	0.90	Idealism	Self- sacrifice
18B	A+ Awareness, Re- Withdrawal	1	Hyper- reflective Awareness	INTP	0.80	Reframing	Excessive abstraction
19B	A- Chaos, Re+ Reflection	1	Reflective Chaos	ISTP	0.95	Creativity	Emotional instability
20B	A- Chaos, Re- Withdrawal	2	Hyper- reflective Chaos	ISTP, INTP	0.80	Defensive Stabilization	Emotional blunting
21A	Ac+ Learning, Re+ Reflection	0	Reflective Learning	S/N, T/F; I/E fused; J/P n/a	0.95	Versatility	Diffuse identity
22A	Ac+ Learning, Re- Withdrawal	1	Hyper- reflective Learning	NT only; I/E fused; J/P n/a	0.70	Deep Analysis	Over- intellectual ization
23A	Ac- Overaction, Re+ Reflection	1	Reflective Overaction	SF only; I/E fused; J/P n/a	0.80	Compassion	Over- accommod ation
24A	Ac- Overaction, Re- Withdrawal	2	Hyper- reflective Overaction	---		Cognitive Reset (True Intuition?)*	Cognitive disorganiza tion

*Possible roles in double-helix strand

This table was derived from the connectivity diagram of all vertices by combining their semantic labels and MBTI patterns. Supplementary Material provides the details.

Cell numbers are assigned with optional letters that indicate its function on the supra-cellular level, as will be explained below. Each cell is assigned with the two cross-polytope's vertices, which are repeated by the hypercube's vertices in all possible combinations with the missing components. E.g., if source poles are T+, Re-, then hypercube's vertices will be of the form T+; Ac±; A±; Re- (four combinations in total). Therefore, the number of exaggerated components (EC) in the source determines the EC of the entire cell: $EC(\text{cell}) = 5 EC(\text{source}) + 4$. These numbers represent inclination toward delicate synthesis vs forceful control and will be used throughout considerations.

The dialectical label represents a simple combination of the source vertices' labels. MBTI types were estimated by counting the required DCs in all vertices (see Supplementary Material). The Score column represents the agreement (0 to 1) between the dialectical label and suggested MBTI type. Its values are very sensitive to the semantic labels of DCs, e.g., replacing Ac- = Overacting with Disrupting gives much

lower values. Still, six rows (~27%) scored 0.7 or below, suggesting that our approximations in Table 3 may be only partially correct. The worst accuracy was for ENFJ and ESFJ in cells 7 and 8.

3.5 Non-Conventional Mental Modes

Fig. 4 shows that all cells can be subdivided into three levels according to EC and into three groups according to MBTI types (A, B, C).

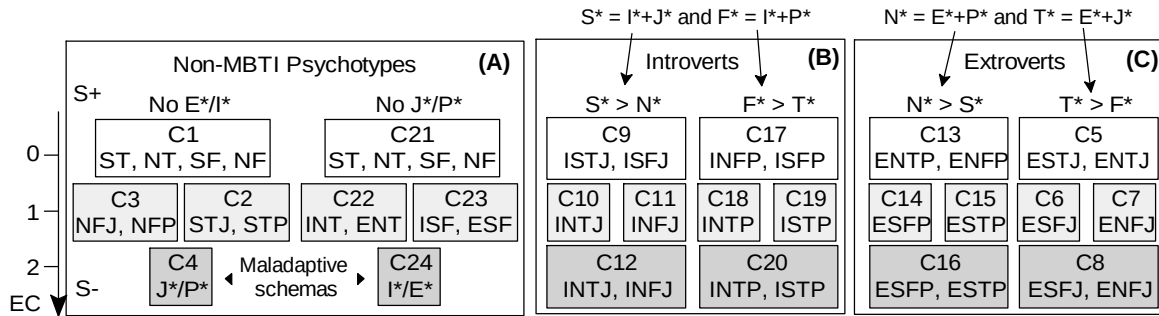


Fig. 4. Properties of octahedral cells

Group A involves the non-MBTI psychotypes with fewer than four letter combinations. These cells lack one temperamental pair (either E*/I* or J*/P*) because its opposing poles have merged into simultaneous expression.

The apex cells (C1 and C21) enable the complete combinatorial integration of these mixed poles. As mentioned earlier, such merging aligns closely with reports from contemplative, mystical, and altered-state practices. Yet, here this merging occurs on the level of “mental mode” rather than affection.

Accounts from Zen, Advaita Vedanta, Sufism, Christian mysticism, near-death experiences (NDEs), and high-dose psychedelic sessions consistently describe the dissolution of the fundamental boundary between inner self and outer world (E*/I*) and between active control and passive surrender (J*/P*). As these temperamental binaries collapse, the corresponding mixed poles (T*/F*, S*/N*) are liberated to operate not as mutually exclusive choices, but as co-active, mutually enhancing dimensions of a unified consciousness.

By Contrast, descent into the lowest-order states (cells C4 and C24) reflects a collapse of systemic integration into mutual sub-system antagonism. Uncoupled

dialectical poles compete for dominance rather than operating synchronously, yielding maladaptive schemata (Beck, 1999; Young et al., 2003), Jungian runaway *enantiodromia* (Jung, 1959), Internal Family Systems intra-psyche polarization (Schwartz, 1995), and modern neurobiological models of psychedelic crisis and acute psychosis (Carhart-Harris et al., 2014; van der Kolk, 2014; Yaden et al., 2017).

3.6 Conventional Mental Modes

Groups B and C refer to introverts and extroverts, respectively (although they could be rearranged to cover Judgmental and Perceptual types). Only 8 MBTI types have individual cells, while others maintain identity only by the unique movement path. The single cell owners have also other residence places, suggesting that each cell is meant to be just a “transition point”. Yet, the very fact that MBTI typology is quite accurate suggests that we tend to settle in certain cells rather than explore our broader possibilities.

Another interesting observation is that certain MBTI types are inherently preferable to others, contrary to the theory of MBTI. Thus, for introverts (group B), Sensing and Feeling are generally preferable over Intuition and Thinking, while for Extroverts (group C) the opposite is true. This can be seen from comparison of psychotypes in the top and bottom cells. For instance, in group B, C9 (ISxJ) >> C12 (INxJ), hence Sensing (S*) >> Intuiting (N*). This follows directly from the assumptions made in Fig. 2 and Table 3. Sensing emerges from $T^+ \approx$ Judging and $Re^+ \approx$ Introverting, therefore it can only emerge in the I^*/J^* surrounding (group B), when both of these components are positive. If any of I^*/J^* is negative, then Sensing is replaced with iNtuiting. Same true in group C. Intuiting (N*) emerges from $A^+ \approx$ Perceiving and $Ac^+ \approx$ Acting, therefore it is favorable in E^*/P^* surrounding (group C). If these considerations are correct, then ~40% people fall into the struggling types (Fig. 5).

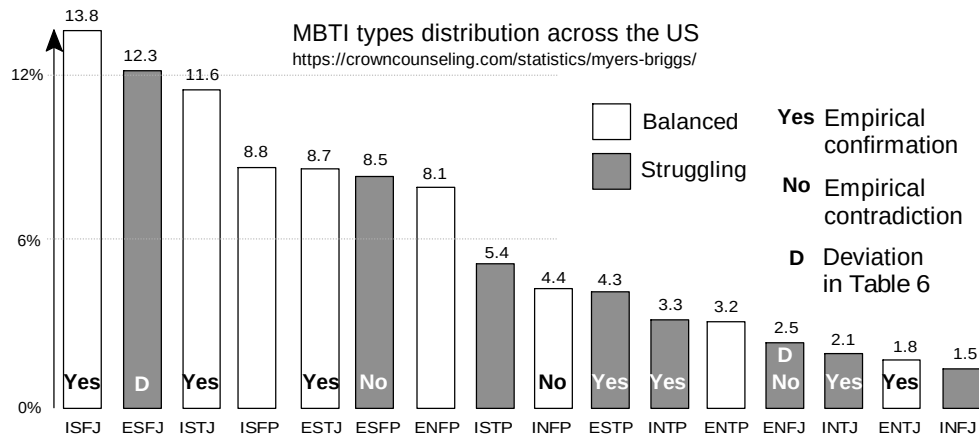


Fig. 5. MBTI type distribution across the USA.

Supplementary Material provides empirical data that agrees with 45% of our predictions, while disagrees with 15% (27% if considering deviations in Table 7). Most likely this means that our assumptions in Table 3 are very approximate.

The very fact of psychotype's stability suggests the lack of self-correction. Hence, some psychotypes must be preferable to others, just because they are fixed.

4. STATIC TRANSITION STRUCTURE

This section provides a phenomenological description of how the geometry may identify particular tendencies and habitual problems. The deeper question of how these transitions combine into constructive or maladaptive trajectories is addressed in the following section on dynamic modelling.

4.1 Cell Adjacency and Accessibility

As mentioned earlier, our developmental goal is to strengthen the ties between the temperamental and mixed personality vertices, which corresponds to personality maturation and gaining emotional intellect. This implies constant changing of the mental modes, by transitioning from one cell to another (Fig. 5).

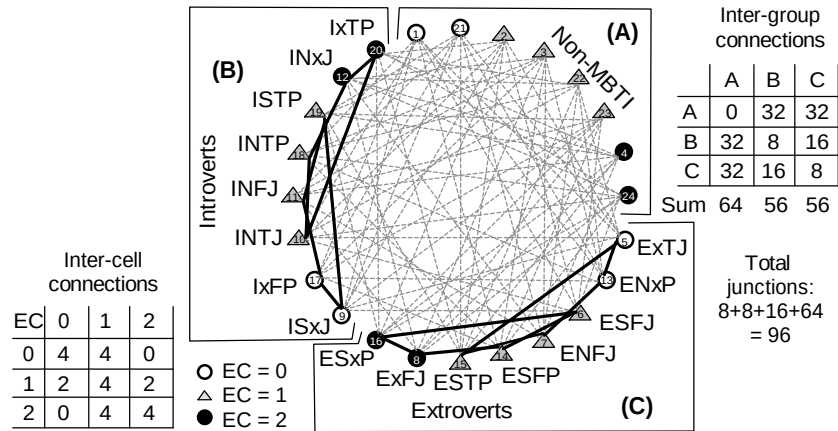


Fig. 5. Interconnectedness of octahedral cells

In this graph, all nodes are grouped according to the clusters A–C shown in Fig. 5. A striking observation is that the non-conventional mental states (Group A) have no internal connections. Consequently, as we change our mindsets, transitions between non-conventional states are always mediated by conventional MBTI-related states (Groups B and C), suggesting that we never completely lose our personality organization.

Conversely, every conventional state shares four of its eight faces with non-conventional states, making Group A the principal bridge between conventional modes of thought. This topology suggests that rapid, spontaneous developmental transitions preferentially traverse mixed, non-conventional states, which may serve as catalytic bridges for higher-order synthesis. By contrast, slow conventional maturation preferentially follows incremental transition paths restricted to standard MBTI mindsets ($B \leftrightarrow C$), emphasizing refinement over the emergence of genuinely novel qualities. This interpretation aligns with long-standing critiques of formal education, which argue that rigid classroom environments often suppress non-linear cognitive transitions, thereby privileging procedural refinement over creative synthesis (Torrance, 1968; Papert, 1980; Robinson, 2001; Beaty et al., 2018).

Interestingly, each hypercube's vertex belongs to 2 cells of each group (A, B, C). Same is with cross-polytope's $T^\pm$ and $A^\pm$ vertices. But $Ac^\pm$ are specifically associated with C (Extroverts) plus the non-conventional A bridge, and never occur in B. $Re^\pm$ are specifically associated with B (Introverts) plus the non-conventional A bridge, and never occur in C.

4.2 Octahedral Faces as Transition Schemas

The 24 octahedral cells share 96 triangular faces that define transition gateways between neighboring mental modes. Supplementary Material characterizes all 96 transition schemas for analyzing behavioral strategies and habitual paths. Fig. 6 illustrates this using cell 10 (Strategy Design) as an example.

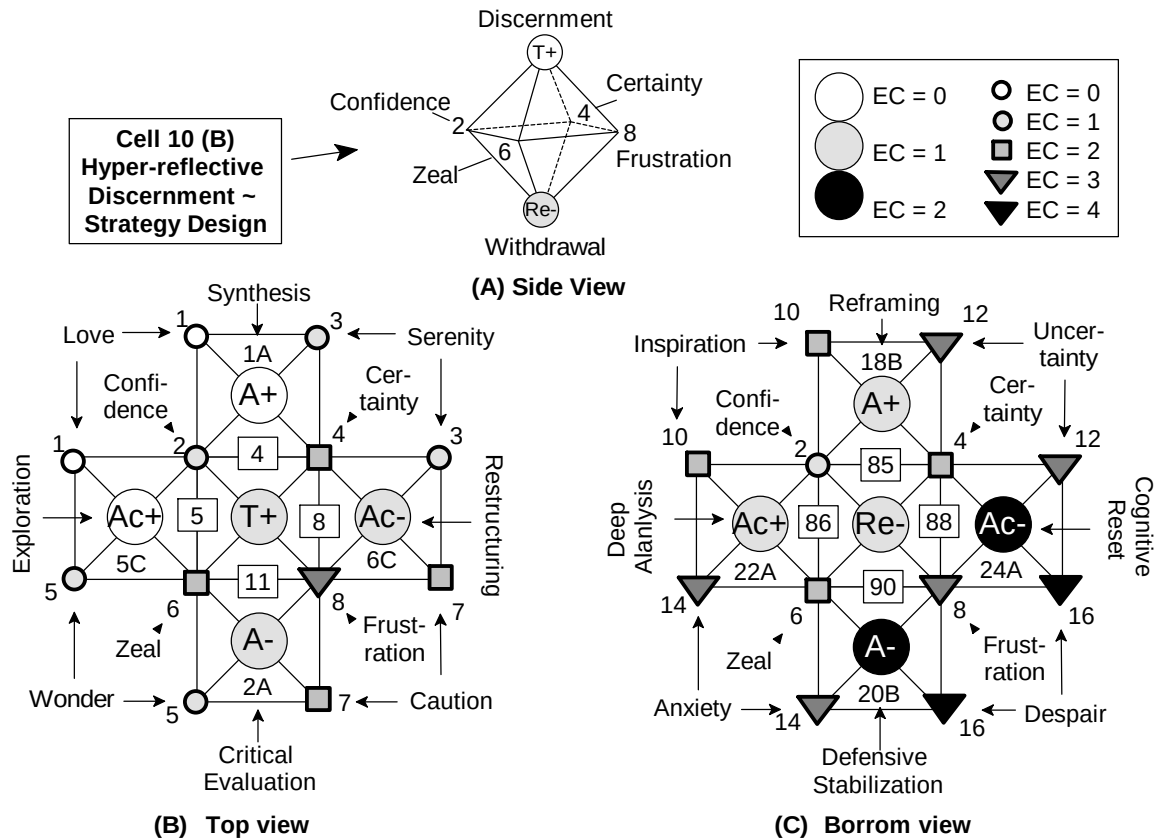


Fig. 6. Eight transitions between cell 10 and its neighbors

Scheme A shows cell 10, while schemes B and C show its eight neighbors through the T+ and Re- views, respectively. The eight faces are numbered in white rectangles according to their IDs in Supplementary Material. Each face combines one temperamental source (large circle) with two affective states (smaller vertex symbols), labeled using the “Subjective” terms from Table 5. Thus, each face represents a possible situational transition from the current mental mode (Table 8).

Table 8. Situational choices within Cell 10 (B, EC = 1)

Situation	Face	Cell	Function	EC	Two-strand model
Need to step back and rethink	85	18B	Reframing	1	Strand I, 3 steps forward
Existential or institutional threat	90	20B	Defensive stabilization	2	Strand II, 1 step back
Attractive opportunity	5	5C	Exploration	0	Strand I, 1 step forward
Unexpected contradiction; or mission achieved	8	6C	Restructuring	1	Strand II, 1 step forward
Familiar, well-understood problem	4	1A	Synthesis	0	
Contradiction requiring resolution	11	2A	Critical evaluation	1	
Complex unsolved puzzle	86	22A	Deep analysis	1	
Framework collapse	88	24A	Cognitive reset	2	

Cell 10 belongs to group B and is adjacent to two B, two C, and four non-conventional A cells. Which face becomes activated depends on the trigger and on how strongly its vertices are developed. For example, when confronted with an unusual dialectical statement, a bureaucratic mind may select restructuring or reframing, a young intellectual may turn to critical evaluation, while a mature thinker may turn to synthesis or deep analysis. Unequally developed vertices may therefore act as attractors. Vertex 6 (Zeal), for example, may favor Exploration (face 5), Critical Evaluation (face 11), Deep Analysis (face 86), or Defensive Stabilization (face 90; see Fig. 6B–C). The probability of activating a particular face can be approximated by an activation score:

$$\text{Activation} = \text{Af1} \times \text{Af2} \times \text{Af3} \quad (4)$$

$$\text{Afx} = \text{Trigger}(x) \times \text{Vertex}(x) \quad (5)$$

Here Afx is the activation affinity toward vertex x, Trigger(x) is the trigger's activating capacity, and Vertex(x) is the strength of that vertex, determined by the weights in Eqs. (1–3). Vertex strengths could be estimated empirically using psychological tests, while Trigger(x) could be estimated by AI from semantic, epistemic, dialectical, or other forms of similarity or complementarity.

This formalism could enable the prediction of reasoning on the “local” affective level. However, these effects may be overridden by more important habitual effects

operating at the persona level, which depend on the dynamics across the entire 24-cell considered below.

5. DYNAMIC MODELLING

The static 24-cell tells us which mental states exist in the model, but not how we grow or degrade. Moreover, static consideration may convey a deceitful impression that our goal is to settle in just few preferred mental states while avoiding all others. For instance, the positive synthesis (S+) loop in Fig. 1B corresponds to the cell #1, while the S- loop corresponds to the cell #24, implicitly suggesting that #1 is preferable to #24. In reality though, #1 is impossible without #24, although the latter may imitate the former, thus suppressing it. The question then becomes, how to access all mental states in the most appropriate manner?

5.1 Optimal Paths: Two Strands

In 2D (a case on the complex plane) S+ involved a sequence of both positive and negative components with a diminishing radius (see [Dialectical Synthesis on the Complex Plane](#)):

$$T+ \rightarrow A+ \rightarrow T- \rightarrow A- \rightarrow T+ \rightarrow \dots$$

Negative synthesis (S-) implied the reversed order of the same sequence. The synthesis was achieved not by preferring only positive components, but by selecting the right direction which eventually decreased the radius of the function:

$$\Psi(\varphi) = e^{i\varphi} [\delta/(\delta + \varphi)]^z \quad (6)$$

Here φ = perspective angle in the T/A plane, δ = perspective resistance, z = adaptive capacity. The increasing perspective angle inevitably brings us into exaggerated T- and A- stances, but under the low enough resistance (δ) and high enough adaptivity (z) the impact of such exaggerations is manageable.

To extend these considerations to the 4D case, simply add the intermediate steps into the above sequence:

$$T+ \rightarrow Ac+ \rightarrow A+ \rightarrow Re- \rightarrow T- \rightarrow Ac- \rightarrow A- \rightarrow Re+ \rightarrow T+ \rightarrow \dots$$

Such addition is unambiguous, since by definition Ac^+ is what transforms T^- (and hence T^+) into A^+ , while Re^+ is what transforms A^- into T^+ (see [Structured Dialectics: A Generative Framework](#)). This corresponds to the sequence of octahedral cells that we call Strand I (Fig. 7A).

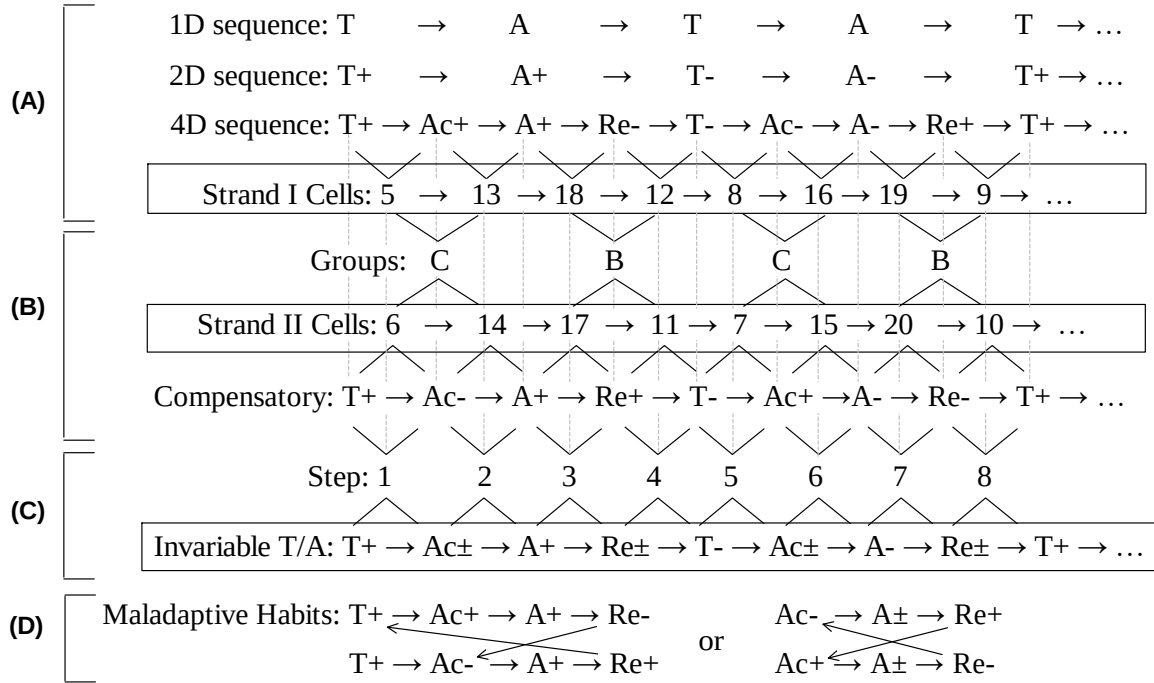


Fig. 7. Preferred vs. maladaptive sequences of mental modes

The obtained sequence involves eight cells representing the conventional mental states of Groups B and C (introverts and extroverts). The remaining eight cells of the same B and C groups compose Strand II, defining the “compensatory” sequence (Fig. 7B). Here, all Ac/Re components have reversed signs, providing a choice between their levels of exaggeration. At the same time, the T/A components remain fixed, providing a common backbone that is independent of circumstances. This yields a double-stranded helix, similar to DNA, that simultaneously preserves our 'backbone program' while guiding its adaptation to external circumstances (Fig. 7C). The notation $Ac^\pm/Re^\pm$ does not imply arbitrary switching, but rather an orchestrated “dancing” mediated by the non-conventional mental states of Group A. The key requirement is that spiraling yields isoclinic rotation as described further.

4.2 The 4D Spiral and Phase Locking

Consider a general 4D rotation, $SO(4)$, that represents two simultaneous rotations in orthogonal planes. Define these planes as T/A and Ac/Re, because the latter can be viewed as habitually independent of the former. Regardless of our T/A claims, our actions and reflections repeat the previously formed patterns, until we forcefully re-align them. This allows extension of equation (6) into the following:

$$\Psi(\varphi_1, \varphi_2) = e^{i\varphi_1} [\delta_1/(\delta_1 + \varphi_1)]^{z_1} + C e^{i\varphi_2} [\delta_2/(\delta_2 + \varphi_2)]^{z_2} j \quad (7)$$

Here φ_1 and φ_2 are perspective angles in the T/A and Ac/Re planes, respectively. δ_1 and δ_2 are perspective resistances, while z_1 and z_2 are adaptive capacities in the respective planes. C is the plane-balance coefficient: $C = 1$ means equal participation of T/A and Ac/Re; $C < 1$ means T/A dominates; and $C > 1$ means Ac/Re dominates.

Eq. (7) follows from a simple rule that a quaternion can always be written as $q = z_1 + z_2 j$, where z_1 and z_2 are ordinary complex numbers built with the same i . If $z_1 = R_1 e^{i\varphi_1}$ and $z_2 = C R_2 e^{i\varphi_2}$, then $q = R_1 e^{i\varphi_1} + C R_2 e^{i\varphi_2} j$.

For synthesis to occur, equation (7) must represent a 4D spiral that converges to the singularity point $(0; 0; 0; 0)$. The ideal convergence should be identical in both planes (T/A and Ac/Re), such that $\varphi_2 = \pm\varphi_1 + \theta$ (phase locking, where θ is a constant shift), $\delta_1 = \delta_2$, $z_1 = z_2$, $C = 1$. When all conditions are met, then we are in the “here and now” mental state where – according to some teachings – our intentions miraculously turn into the material reality.

Since we have two strands with different phase shifts, we must consider time dependence of their continuous transition:

$$\varphi_2(t) = -\varphi_1(t) + \theta(t), |\dot{\varphi}_2(t)| = |\dot{\varphi}_1(t)| \quad (8)$$

This restricts the phase dynamics to $\dot{\theta} = 0$ or $\dot{\theta} = 2\dot{\varphi}_1$. The first case describes phase-locked progression within either strand, with $\theta = \theta_0$ for Strand I and $\theta = \theta_0 + \pi$ for Strand II. The second permits a continuous isoclinic transition between the strands; a complete switch requires $\Delta\theta = \pi$ and therefore $\Delta\varphi_1 = \pi/2$. Any other evolution of θ represents desynchronization.

The key in achieving this state is in balancing our two principle roles: the T/A plane that regulates our inner morale – what we stand for, and the Ac/Re plane that regulates our habits – how we seek what we claim. If the T/A plane leads, we risk becoming the naïve idealists, while if the Ac/Re plane leads, then we risk becoming the cynical pragmatists.

5.3 Transition Mechanisms

Fig. 8 shows that the two strands are interconnected in three different ways that determine our adaptability, resilience, and ability to produce synthesis.

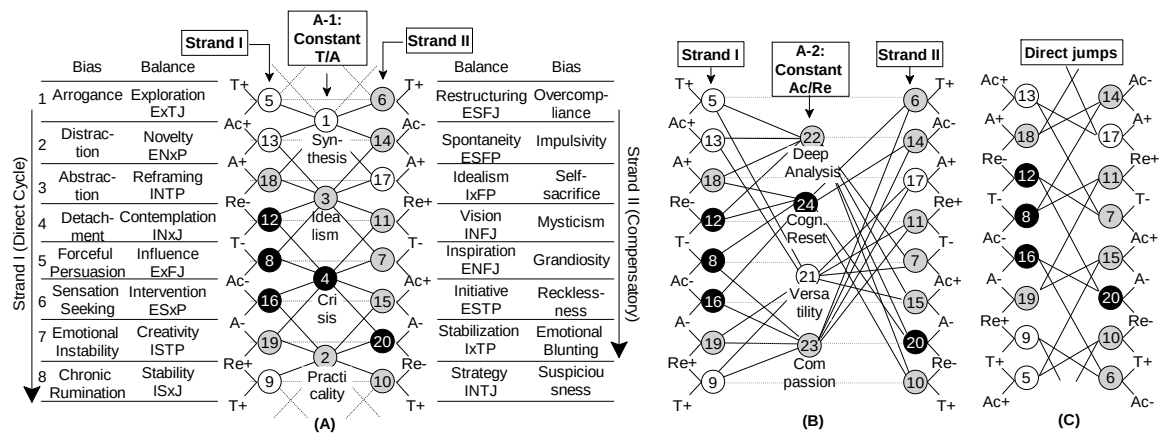


Fig. 8. Three types of interconnections between strands I and II

Scheme A shows interrelations mediated by the non-conventional mindsets given by the class A cells with T/A cross-polytope vertices (“A-1”). Such transitions ensure synthesis conditions by satisfying two crucial requirements. First, they preserve the T/A backbone components, thus stabilizing our inner focus toward the higher consciousness (enabling higher levels of T/A subtlety in the 4+D space). Second, they provide simultaneous access to all positions in a given vicinity of both strands, such that equation (8) can be met at all times. This enables both flexible transitions between strands and the possibility of fixing any errors that might have been made in the previous steps. Our location in double-helix becomes scattered like an EM wave or electron cloud that simultaneously exists in many different points.

Scheme A shows interrelations mediated by the non-conventional mindsets given by the class A cells with T/A cross-polytope vertices (“A-1”). Such transitions favor

synthesis by satisfying two crucial requirements. First, they preserve the T/A backbone components, thus stabilizing our inner focus toward higher consciousness (enabling higher levels of T/A subtlety in the 4+D space). Second, they provide simultaneous access to multiple nearby positions in both strands, potentially allowing the Ac/Re phase to shift between the two phase-locked regimes without disrupting progression of the T/A backbone. Thus, A-1 transitions may provide a mechanism for controlled evolution of $\theta(t)$, including correction of errors made in previous steps.

(Note that the balanced expressions of the strictly horizontal counterparts may heal each other's exaggerated expressions. E.g., exaggerated side of cell 13 (Distraction) may be healed by the balanced side of cell 14 (Spontaneity), while the balanced side of cell 13 (Novelty) may heal the exaggerated side of cell 14 (Impulsivity). This may also suggest that the corresponding MBTI types – ENxP and ESFP – should be complimentary, although in practice this is not always the case.)

Scheme B shows mediation by the non-conventional mindsets with Ac/Re cross-polytope vertices (the A-2 transitions). Such transitions may be related to what we call the intuition and/or the ability to calculate many steps ahead, because they connect any given step with nearly all other steps in both strands. In addition, fixing the Ac/Re components favors development of habitual behavior that increases C in eq. (7) and can save us in turmoil times. Even if our T/A formulations change because of external pressure, our habitual behavior keeps us moving forward. This provides flexibility for the micro-adjustment of our T/A stance “on the go”.

On the other hand, A-2 transitions do not favor dialectical synthesis directly. By fixing an Ac/Re component while permitting broad changes in T/A, they tend to perturb rather than preserve the phase relation between the two planes. Each position X is connected with six positions in the opposite strand, yet only one forward connection (X+1) preserves the ordered progression of the double helix (Fig. 9B). Thus, A-2 transitions may be highly effective for anticipatory adaptation or execution under rapidly changing circumstances, but they don't support the self-correcting synthesis path.

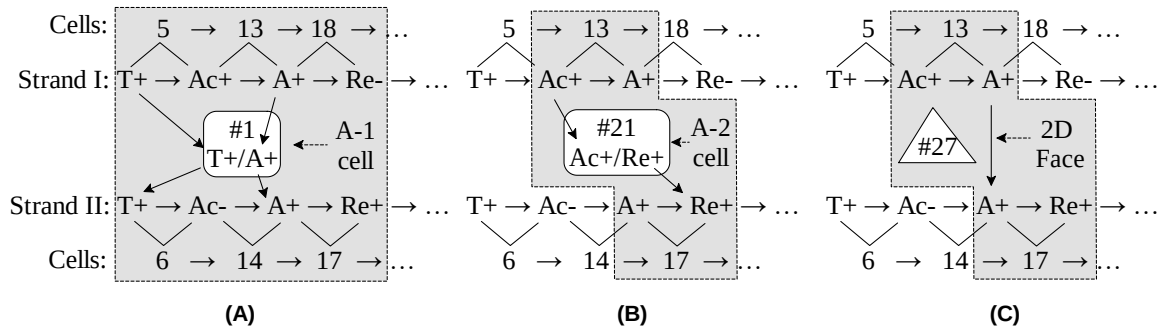


Fig. 9. Examples of interconnections between strands I and II

As a consequence, people who possess A-2 but lack A-1 transitions may be perceived as hypocrites or even deceitful traitors with disciplined execution skills. Think of bloody traders who acquire wealth during the turmoil times, because they cannot solve the problem by creating genuine synthesis of something new, yet they are disciplined enough to take advantage of the volatile situation. This may explain why all wealth is accumulated in hands of cynical pragmatists who prefer power games and wars over peaceful synthesis of higher consciousness. May be this is why we live in times of the extreme polarization and orthodox technocracy?

Scheme C in Figs. 8 and 9 shows the direct (unmediated) transitions between the two strands. Each bond sends us ± 1 and ± 3 positions relative to the horizontal counterparts, somewhat resembling the A-2 transitions: they can aid intuitive adaptation, but not direct synthesis. Yet, here each position is connected to just 2 (rather than 6) positions in another strand. These two connections, unlike the remaining 4, seem to be available to us without any special training. For instance, cell 13 (Novelty seeking) is connected to cells 17 (Idealism) and 7 (Inspiration), all of which seem to naturally belong to each other. This cannot be said about most other connections in Table 9.

Table 9. Connections from position 2 of strand I
(Cell #13C – Novelty Seeking, EC = 0) to Strand II

				A-1		A-2		
Step	EC	Cell	Exaggerated	#2	#3	#22	#21	Direct
1	1	#6C – Restructuring	Overcompliance	X				
<u>2</u>	<u>1</u>	<u>#14C – Spontaneity</u>	<u>Impulsivity</u>	<u>X</u>	<u>X</u>			

3	0	#17B – Idealism	Self-Sacrifice	X	X		X	X
4	1	#11B – Vision	Mysticism		X		X	
5	1	#7C – Inspiration	Grandiosity		X	X	X	X
6	1	#15C – Initiative	Recklessness			X	X	
7	2	#20B – Stabilization	Emotional blunting			X		
8	1	#10B - Strategy	Suspiciousness	X		X		

For instance, relating #13 (Novelty seeking) to #20 (Stabilization) clearly requires prior training / live experience.

Also note, that most cells can be accessed by more than one route, while two can be accessed by four routes. This means that each cell can perform different functions depending on how it was unlocked. Compare this to accessing a house via the main entrance, service door, garage, or window.

5.4 Maladaptive Schemas

A full cycle of the 4D spiral involves eight recurring steps (Fig. 7C), while the complete adaptive repertoire potentially engages all 24 cells. If some cells remain inaccessible, the trajectory becomes restricted and may form distorted schemas. A common source of such restriction may be avoidance of non-conventional (Type-A) mindsets. As noted earlier, such mindsets may need to be empirically experienced before they become routinely accessible. Persistent avoidance of particular life situations may therefore leave some transition mechanisms underdeveloped. The resulting behavior may become immature or disproportionate—either overreacting or underreacting—because it remains confined to a limited subset of trajectories. The system may then repeatedly select inappropriate exits from a strand, producing shortened recurrent loops (Fig. 7D). Table 10 summarizes several predicted forms of such restriction.

Table 10. Predicted consequences of restricted cell accessibility

Access	Functional limitation	Possible manifestation
24 cells	Maximum flexibility; multiple routes for correction and synthesis	Mature/adaptive repertoire; ability to enter unfamiliar perspectives
16 B/C + A-1 only	Good self-correction but weaker anticipatory repositioning / learned execution under uncertainty	Poor judgment in unfamiliar situations; naïveté; difficulty “thinking several moves ahead”

16 B/C + A-2 only	Adaptation without reliable integrative self-correction	Opportunism, inconsistency between stated principles and behavior, apparent hypocrisy
16 B/C only	Dependence on habitual/direct routes; reduced flexibility in correcting trajectory	Immaturity, rigidity, poor adaptation to novel situations
One strand strongly favored	Persistent over-/under-expression of Ac/Re components	Chronic overreaction or underreaction; difficulty compensating
Restricted B/C subset	Missing conventional mental modes; shortened cycles/attractors	Persistent cognitive/affective dysfunction; candidate psychopathological pattern
<8-cell recurrent repertoire	Same limited sequence repeatedly recruited despite changing circumstances	Maladaptive schema; stereotyped reasoning/behavior
Very small rigid attractor	Failure to escape a narrow state-transition cycle	Candidate severe dysfunction; requires clinical validation

If this analysis is correct then cell #4 should be assigned to the „Radical Honesty“, while #24 to the „Intuition-driven urgency“

6. BROADER INTERPRETATIONS

6.1 Correspondence with the Kabbalistic Tree of Life

Interestingly, the transition architecture in Fig. 8 bears a qualitative resemblance to the Kabbalistic Tree of Life (Fig. 11A). Compare it to Fig. 11B which represents a combination of the simplified schemes from Figs. 8A and 8C. Topologically, Fig. 11B reproduces 20 of 25 interconnections from Fig. 10A. The remaining 5 connections (denoted in grey in Fig. 11A) require considering the 2-step transitions.

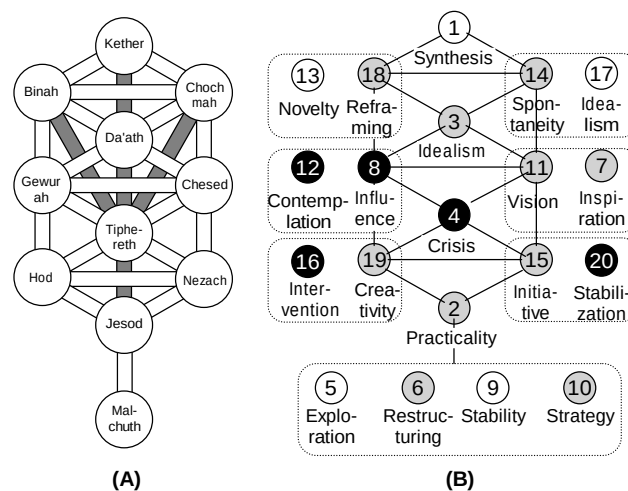


Fig. 11. Possible interpretation of the Kabbalistic Tree of Life

Table 11 shows that the meanings of elements in both schemes can be related through Tao Te Ching parallels, although direct comparison reveals apparent contradictions. This may reflect the limitations of literal interpretation, as wisdom traditions always require dialectical thinking.

Table 11. Comparison of elements in Fig. 10 A and B

Kabbalah	Traditional function	24-cell	Taoist parallel*
Keter	Crown; supra-intellect, will, source encompassing the lower sefirot	Cell 1 — Synthesis	Synthesis opens higher dimensions. (TTC 1, 42)*
Chokhmah	Wisdom, insight, conception; initial intuitive apprehension	Cells 14 & 17 — Spontaneity, Idealism	The highest wisdom is natural spontaneity. (TTC 2, 48)
Binah	Understanding, reasoning, development/comprehension of an insight	Cells 13 & 18 — Novelty seeking, Reframing	The deepest understanding comes from reframing old truths. (TTC 47, 48)
Da'at	Knowledge, consciousness, awareness, bonding/internalization	Cell 3 — Idealism	Everything is ultimately an idea. (TTC 1, 14)
Chesed	Loving-kindness, benevolence, expansive giving/love	Cells 11 & 7 — Vision, Inspiration	The deepest love is envisioning and inspiring. (TTC 10, 51)
Gevurah	Might, restraint, severity, discipline, limitation	Cells 12 & 8 — Contemplation, Influence	The greatest influence comes from humility. (TTC 8, 22, 66)
Tiferet	Beauty, harmony, compassion; mediation/balancing of Chesed and Gevurah	Cell 4 — Crisis, warning intuition	The highest beauty emerges at the edge of contradiction. (TTC 2, 45)
Netzach	Victory, endurance, persistence, overcoming obstacles	Cells 15 & 20 — Initiative, Stabilization	The greatest victory comes through small but stable steps. (TTC 64)
Hod	Splendor, acknowledgment, submission/gratitude; adaptation of what is transmitted	Cells 16 & 19 — Intervention, Creativity	The highest splendor is creative intervention. (TTC 37, 45)
Yesod	Foundation; connection, communication and transmission/integration of preceding influences	Cell 2 — Practicality	The strongest foundation is practicality. (TTC 11, 64)
Malchut	Kingdom/kingship; expression, manifestation and reception of preceding sefirot	Cells 5, 6, 9 & 10 — Exploration, Restructuring, Stability, Strategy	A kingdom survives through movement, not stasis. (TTC 40, 60)

*TTC = Tao Te Ching. References indicate conceptual parallels rather than direct equivalences.

From the 24-cell perspective, the Kabbalistic Tree of Life should be viewed as a dynamic rather than static structure. The apparent hierarchy of mental states may be deceiving once some become artificially preferable to others. Most importantly, the following section suggests why every complex teaching inevitably becomes distorted when communicated intellectually rather than through practical examples.

6.2 Mindsets as Antennas

An interesting view is that all mindsets, both individually and collectively, function as “pulsating antennas.” Cells with higher EC values (numbers of exaggerated components) represent greater forcefulness, analogous to stronger transmission, whereas cells with lower EC values indicate greater subtlety and exploratory ability, analogous to higher receptiveness. Fig. 10 shows that cells in both single and double strands form oscillating EC patterns that may be viewed as a Morse-like code.

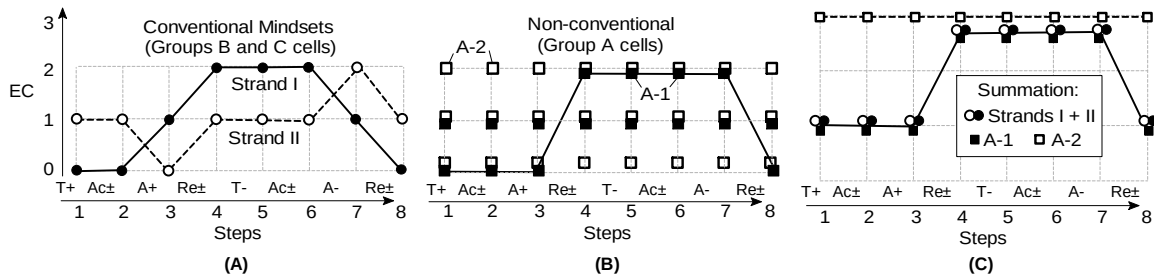


Fig. 10. Comparison of stepwise exaggerations

Scheme A shows that at every step we have a choice to function more as either a transmitter or a receiver. The sum of EC values over all positions in each strand remains constant, suggesting that they both carry similar functionality. Yet, their patterns are shifted relative to each other, somewhat reminiscent of the brain, where the left and right hemispheres predominantly control the opposite sides of the body.

Scheme B shows that the non-conventional mindsets can function as amplifiers with a wide range of signal regulation. Scheme C represents the summations of EC values over both strands and all A-1 and A-2 cells, calculated separately. The A-1 cells are generally aligned with double-strand functioning, while the A-2 cells form an independent constant background. The apparent invariability of the latter may be deceiving, since it assumes that all A-2 cells are being used to the same extent. In reality, everyone develops an individual pattern, since we all have some repeating habits.

This supports a broader model of reality based on a unified consciousness field, where information is represented as affective exaggerations. Here, matter and other tangible effects result from synchronizations mediated by non-conventional mindsets. Consider Jung’s “Acausal Synchronicity” and Rupert Sheldrake’s Morphic Resonance theories, which, taken together, suggest that reality emerges through cognitive

synchronizations of habitual behavior with wider mental fields. From this perspective, richer (higher-dimensional) affective states encode more nuanced instructions about what we actually want, enabling these intentions to be communicated to the wider field. Hence, our goal is to synthesize new cognitive dimensions that generate richer affective states—and thereby communicate increasingly nuanced intentions to reality.

This also explains the phenomenon of “blind spots”, since when we stay too long in a transmitting / power mode, we no longer see what becomes visible in a receiving / humble mode. This is why teachings must be led by personal practical example rather than intellectual description alone—because the act of explanation eventually becomes distorted by our own “preaching blindness.” Instead of explaining everything to the last detail, we must use our energy to open new dimensions.

6.3 Beyond 4D: Toward E8

This naturally raises the question of what further cognitive dimensions might emerge beyond the 4D structure. The algebraic continuation leads to an 8D octonionic space (Table 12).

Table 12. Evolution of SD models

Dimensions	Components	Poles	Mixed states	Total states	Shape	Personas x states x roles
1D	1 relation: $T \leftrightarrow A$	2	—	2	Line	---
2D	$T_{\pm}, A_{\pm}$	4	—	4	Square	1 x 1
4D	$T_{\pm}, A_{\pm}, Ac_{\pm}, Re_{\pm}$	8	16	24	24-Cell	1 x 24
8D	$T_{\pm}; A_{\pm}; Ac_{\pm}; Re_{\pm};$ $T^*_{\pm}; F^*_{\pm}; S^*_{\pm};$ $N^*_{\pm}$	112**	128	240	E8	10 x 24 x 3150

**In 8D, the 16 individual poles ($X_{\pm}$) define eight bipolar components but are not themselves E8 vertices. Due to the even-lattice constraint, the simplest admissible E8 states are their pairwise combinations ($X_{\pm}, Y_{\pm}$), yielding 112 vertices. Thus, the 112 pairwise states represent the 8D analogues of the individual poles in the lower-dimensional models. The remaining 128 vertices are fully mixed states, giving 240 vertices in total. *The 112 pairwise states comprise 28 tetrads of the general form $(X+, Y-)$, $(X+, Y+)$, $(X-, Y+)$, and $(X-, Y-)$, where $X \neq Y$ and $X, Y \in \{T, A, Ac, Re, T^*, F^*, S^*, N^*\}$.*

Such progression follows from representing dialectical synthesis as isoclinic vector rotation, pointing toward composition algebras that exist in dimensionalities $n = 1$,

2, 4, and 8 ([Hurwitz theorem / composition algebras](#)). Hamilton famously spent many years trying to extend complex numbers into three dimensions before discovering that the required structure emerged in 4D quaternions. This means that three elements cannot simply unite to produce a 4th independent element. Rather, the 4th element represents an alternative form of the 3rd element, arising as a new combination of the original T/A components. Similarly, five elements cannot simply unite to produce the 6th. Rather, the 6th, 7th, and 8th elements represent alternative forms of the 5th, resulting from different weights in Eqs. (1–3). Only when all eight elements become available can they participate as equivalent components in producing the next synthesis.

Table 12 illustrates our representation of classical Hegelian dialectics as a 1D oscillation between thesis (T) and antithesis (A). This gives rise to the internal polarizations of T and A, converting each into a bipolar semantic differential ($T_{\pm}$; $A_{\pm}$). Together, these form a complex plane, transforming the linear oscillation into a 2D spiral. The very fact of 2D rotation then creates the necessity for intermediate steps (as shown in Fig. 1B), giving rise to two new components, Ac and Re. (Note that these components can be viewed as manifestations of the intrinsic parameters of the 2D spiral: conscious plasticity $z \sim Ac$ and subconscious inertia $\delta \sim Re$.) Eventually, Ac and Re begin to manifest as habitual elements that behave independently of T/A, allowing them to be represented as new semantic differentials ($Ac_{\pm}$; $Re_{\pm}$).

This lifts our model to the 4D level. Here, Eqs. (1–3) yield new intermediate combinations (T^* , F^* , S^* , N^*), each of which produces a new semantic differential (Table 3). This brings us to the 8D space, where we encounter a new and quite unexpected phenomenon associated with the even-lattice constraints of E8: individual polarizations ($X_{\pm}$) no longer constitute vertices and are replaced by pairwise combinations ($X_{\pm}$; $Y_{\pm}$). For instance, simply implying T^+ becomes insufficient—we must combine it with an additional argument (e.g., $T^+ + F^{*+} \rightarrow$ “I discern it and positively value it”). Thus, we obtain 28 pairs, each yielding four vertices ($+/+$; $-/-$; $+/-$; $-/+$), or 112 vertices in total. These coexist with 128 new higher-order mixed vertices, analogously to how the eight cross-polytope vertices coexist with the 16 hypercube vertices in the 4D 24-cell. Altogether, this gives 240 dialectical states forming more than

10^6 lower-dimensional faces and volumes. Within the E8 root polytope, these states can be partitioned into 10 disjoint 24-cells, while 3,150 overlapping D4 root subsystems provide a potential geometric basis for adaptive situational roles and context-dependent code-switching.

There we get SO(8) rotation, implying simultaneous rotations in 4 orthogonal planes. Isoclinic rotations are replaced by the triality symmetry, where three completely different operational perspectives (e.g., *Subjective Trait*, *Objective Action*, and *Meta-Awareness/Observer*) rotate into one another seamlessly. E8 can be presented as two 600-cells – just like our brain (and entire body symmetry) is represented as two halves (left and right). Also note that E8 describes the phenomenology of elementary particles (via Garet Lisi's Extremely Simple Theory of Everything), suggesting that the same principles may build the entire Universe.

There we get SO(8) rotation, implying simultaneous rotations in 4 orthogonal planes. Isoclinic rotations are complemented by the remarkable triality symmetry, where 3 completely different operational perspectives (e.g., *Subjective Trait*, *Objective Action*, and *Meta-Awareness/Observer*) can be viewed as transforming into one another seamlessly. E8 can be presented as two 600-cells—somewhat reminiscent of our brain (and the entire body), which is organized into left and right halves. Also note that E8 has been used to describe the phenomenology of elementary particles (e.g., Garrett Lisi's *An Exceptionally Simple Theory of Everything*), suggesting the intriguing possibility that similar organizing principles may extend all the way to the fundamental structure of the Universe.