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# TESTING A HIERARCHICAL-RETICULAR MODEL OF THE PSYCHE: A CYBERNETIC FLUX ENGINE IN THE PERSONALITY SPHERE

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## Abstract

*As part of structured systems theory, Cattell (1957, 1965) and Digman (1963, 1997) proposed hierarchical-reticular models of the Language of Personality Sphere (LPS). Hamilton (2026) retrofit their most promising framework, the stratoplex, with a cybernetic flux engine. The psychodynamic tripartite core of the stratoplex generates three functions: socialization, personal growth, and emotional regulation. The three engine functions are responsible for causal relations between deep traits (domains) that consist of the Big Five plus Psychopathy-Aggressiveness. Within deep traits, the engine specifies the operation of shallow traits (aspects). These shallow traits are hypothesized to serve as subsidiary coordinating structures. On the shell of the LPS, these aspects project surface traits (facets). Retrospective causal modeling of four studies (Total N = 1799) found stronger support for the stratoplex framework and cybernetic flux engine using Big Five data, as compared to 16PF data. Results support conceptualizing the socialization process as two circuits operating in parallel. The risk manages circuit contains the*

*Conscientiousness (C) and Neuroticism (N) domains, with C inhibiting N. During emotional regulation, Intellect increases C while decreasing N, with C and N both diminishing Assertiveness (E2). The social dominance circuit contains the Psychopathy (P) and Agreeableness (A) domains, with Eclectic dominance inhibiting A, with A increasing Aggressiveness (P2). Consistent with Belief Systems Theory, aggressiveness can be justified via an authoritarian, emotional, or rational process. The results also support further differentiating the personal growth process by tracking the impact of Intellect (I) and Openness(O) on Enthusiasm (E1) and E2.*

**Keywords:**
Language, Personality, Structure, Hierarchical, Reticular

## Introduction

Half a century after Francis Galton (1884) proposed his framework for studying personality, Louis Thurstone (1934) created the Language of Personality Sphere (LPS) as a hierarchical model to map shared personality-related perceptions and memory. Not long after that, Cattell (1943) extended Thurstone's concept of trait clusters using the "Tryon system" of factoring (Tryon, 1939), adding strata to the LPS (Cattell, 1946). Structured systems theory specifies three strata in the LPS that vary in depth of meaning (Cattell, 1957). At the core of the strata system is the Freudian tripartite psyche. Cattell (Cattell, 1950, 1957; Pawlik & Cattell, 1964) focused on the structural factors of the psyche (the id, ego, and superego). These structures exert causal influence on deep source factors (Cattell, 1986; Cattell & Kline, 1977; Draycott & Kline, 1995) known within the five-factor model (FFM) as domains (Costa & McCrae, 1984).

Rather than focus on structure of the psyche, Digman (1963) chose to concentrate on the three functions that emerge from the influence that the three structures exert on one another. His interest in the reticular dynamics among these functions (Digman, 1963) led to his meta-analysis that argued for causal relations among the Big Five domains (Digman, 1997). Structured systems theory, as a kind of general systems theory, connects function to structure (von Bertalanffy, 1950). At the deep source layer, the correlations among the factors (domains) reflect stereotypic causal influence (Cattell & Digman, 1962). Stereotyped Influence Patterns (SIPs) add reticular effects to hierarchical structures (Cattell, 1965). These reticular structures contain manifold causal connections among the deep source factors. Of the various SIPs that Cattell (1965) considered, he thought that the most viable was the *stratoplex*. Factors in the shallow source layer of the LPS, which FFM researchers would call facets, would be a function of one or more higher-level factors rather than a distributed coalescence.

The present research conducted four empirical tests of the hierarchical-reticular stratoplex personality framework. Based on structured systems theory (Cattell, 1946, 1957, 1965; Digman, 1963, 1997), the stratoplex builds on psychodynamic theory (Freud, 1943). Recently, Hamilton (2026) retrofit the stratoplex with a Galtonian cause-effect engine characterized by cybernetic flux. The Cattell-Digman strata system holds that flux occurs within the LPS as a person develops from childhood to adolescence. This cybernetic engine includes semantic relations between six domain-level traits as predicted by Belief Systems Theory (Hamilton & Mineo, 1996, 1999; Rokeach, 1960, 1968), as well as coordinated relations within those deep traits. The research that follows tests a trio of predictions regarding trait dynamics, providing further insight into socialization, personal growth, and emotional regulation as functions within the LPS.

Research on reticular structures in the LPS paused because early tests of models such as the stratoplex framework seemed to display a puzzling pattern of results, which would have discouraged Cattell. A recent re-analysis of those early tests (Hamilton, 2026), however, suggests that hyperplane restrictions on 16PF factor loadings, imposed by hand rotation and the automated program ROTOPLOT, attenuated the correlations among the deep source traits. The Digman (1997) metatrait findings and his compelling argument for reticular effects among the Big Five domains should have rekindled interest in the stratoplex framework, but the death of both Cattell and Digman in 1998 cut short what might have been a resurgence. The results from the research that follows provide further evidence that models with reticular effects merit further consideration.

## 1. Developing a Cause-Effect Engine of Personality

At the dawn of the scientific study of psychology, Galton (1884) proposed an incipient yet determinative causal model of emotional temperament and character. This cause-effect "engine" (his term) includes three key suppositions that garnered sufficient support to become assumptions and then evolve into testable hypotheses. The normative consistency hypothesis holds that traits are reliable across both time and situation. Galton believed that traits should stay on a trajectory that changes only at major turning points in a person's life. The environmental effects hypothesis holds that researchers can quantify the impact of life events on temperament traits.

Galton believed that profound achievement or stress emanating from the environment influences traits. The lexical hypothesis of personality holds that everyday language contains lexical items that reveal latent personality traits. Galton believed that researchers should use entries from a dictionary or thesaurus as databases that they can then distill down to the essential dimensions of personality.

### 1.1 Environmental Effects on Personality

Galton (1884) was concerned with grief in response to “great trials” or “emergencies” – which researchers today could construe as traumatic life events. He was also concerned with temper and the common occurrence of feeling insulted or scolded in response to lesser trials, which researchers today could interpret as social undermining. Moreover, he showed concern for “suspense” – which researchers today can understand as a lack of closure or the inability to fulfill needs. Galton’s temperament model was therefore a forerunner of modern models that address types of stress and how stress hierarchies impact personality (Hamilton & Veksler, 2014).

#### 1.1.1 Input from the Environmental Sphere

The LPS exists within cybernetic entities, including functional humans and simulants connected to artificial intelligence (AI). The LPS references the words within a given culture that describe personality (Cattell, 1957, 1977). The environmental sphere (ES) exists within social networks, including in-person communities and social media. The ES is a conduit for words within a given culture that describe the elements of a situation along with positive and negative motives (Cattell, Pierson, and Finkbeiner, 1976). Each LPS can be a node connected through a social network such as Facebook, YouTube, Instagram or TikTok. People can communicate via the ES by posting to the platform or more personally through direct messaging.

Environmental inputs from the ES to the LPS are known as ecometric effects (Cattell, 1979). These effects can result from emotionally valenced interpersonal exchanges that involve social support or social undermining. Alternatively, they can result from a more neutral ambiance due to input from the milieu. Personal inputs from the LPS through the ES, exert reciprocal influence, as endometric effects (Hamilton, 2026). Time-lagged propagation should characterize these LPS→ES effects. Cattell (1979) suggested using factor analysis to estimate hierarchical LPS effects and causal modeling to estimate reticular ES→LPS effects.

#### 1.1.2 Aggregated Appraisals and Personality Domains

As sentient entities (i.e., most higher-level organisms) receive input from the ES, their emotional response to environmental information entails a sequence of appraisals (Sherer, 1984, 2001). These receivers (for the purpose of this hypothesis humans or future simulants that can access massive neural networks) apply stimulus evaluation checks (SECs) as they process information about objects and concepts. After receivers perceive the information, they orient toward it along two dimensions, a spatial continuum and an event continuum, then allocate their attention accordingly (Hamilton, 1997). The spatial focus dimension, plotted on the x-axis, is anchored by self on the low end and environment (other) on the high end. The event focus dimension, plotted on the y-axis, is anchored by avoid on the low end and approach on the high end.

As receivers mature, they accrue years of SEC appraisals that populate the two-dimensional orientation matrix. This cumulative experience should produce consistent patterns of response to environmental inputs that manifest as personality traits. That is, the orientation grid serves as a basis for the configuration of domains in the LPS. Sharing the x-axis, the socialization dimension of the Digman (1997) LPS maps onto the self-environment (other) orientation as his a metatrait. Sharing the y-axis, the personal growth dimension of the Digman (1997) LPS maps onto the avoid-approach orientation as his b metatrait. With socialization on the x-axis and personal growth on the y-axis, this two-dimensional plot corresponds to the Equatorial cross-section of the stratoplex (see Hamilton, 2026, Figure 2).

## 2. Fitting a Cybernetic Flux Engine to the Stratoplex Framework

In his initial 12PF factoring, Cattell (1943) extracted nine multi-strata factors that included six deep source traits and three core source traits. His six deep source factors were like those of modern five-domain and six-factor models, where intellect takes a leading role (Hamilton, 2026). Later, Cattell (1946) developed the three core source factors in conjunction with psychoanalytic theory (Freud, 1943). Seeing further parallels to psychoanalysis, Cattell (1957) associated Conscientiousness, Tact, and Selfishness as expressions of the super-ego, ego, and id structures. In their later proto meta-analysis, Pawlike and Cattell (1964) equated their three third-order factors with elements of the psyche, arguing that self-centered temperament was a measure of the id, acceptance of external norms was a measure of the super-ego, and self-assertiveness was a measure of the ego.

With his focus on the functions of the three psychodynamic structures rather than the structures themselves, Digman (1963) identified three processes operating at the core level of the

LPS. Decades later, he conceptualized these functions as metatraits (Digman, 1997). The cybernetic flux engine posits that these functional processes generate specific relationships among the second-order, deep source traits (Hamilton, 2026).

### 2.1 Core Structure and Affect Systems in the LPS

Borgotta (1962) clustered factors from four popular personality inventories (e.g., 16PF). He reported two "major clusters" among the first-order factors. Cluster I was dominated by an Extraversion factor that also included an Active factor (Openness-Intellect), and Eclectic Dominance (P domain). Cluster II was dominated by Emotional Stability (-N domain) and Affiliation (A domain). Similarly, in his foundational meta-analytic work on the Five Factor Model (FFM) domains, Digman (1963, 1997) reported higher-order factors that were dominated by the N domain (which loaded with the A and C domains) and the E domain (which loaded with the O domain). Comparing the two approaches, the Borgotta major clusters omitted the C domain whereas the Digman metatraits omitted the P domain.

Initially, Digman (1963) had been working with the 16PF, so he was familiar with P as measured by Eclectic dominance. He proposed that the configuration of N, C, and A correlations was due to a socialization process, arraying the three domains along the x-axis of the LPS. He also proposed that the configuration of the O and E correlations was due to what he later called a personal growth process (Digman, 1997), arraying the two domains along the y-axis of the LPS. With the P domain added, a six-domain structure is quite similar to the 5+1 model of Heaven et al. (2023); it also resembles the HEXACO model (Ashton et al., 2023), albeit with a reverse-coded H factor.

Belief Systems Theory (BST) provides a coordinated account of the six-domain structure, where deep trait pairs are nested within three subsystems (Hamilton, 2026). In BST, two distinct affect subsystems mesh with heterostatic control to color beliefs. The individualistic affect system generates selfish (self-oriented) emotions, ordinating the Anxiety (N domain) and both aspects of the P domain -- Eclectic dominance and Aggressiveness. It is tied to the psychodynamic id structure. The cooperative affect subsystem generates prosocial (other-oriented) emotions, ordinating the self-control (C domain) and tact (A domain) deep traits. It is tied to the psychodynamic super-ego structure. Heterostatic control would provide a throughput apparatus for growth, ordinating the Intellect (O domain) and Surgency (E domain) deep traits. It is tied to the psychodynamic ego structure.

## 2.2 Antagonistic Affect Subsystems and l Deep Trait Subordination

The three subsystems and their ordinated deep traits can be mapped onto the self-environment (other) orientation continuum with effect coding. Selfish emotions emanating from the individualistic affect system that infuse the N and P domains would be coded with negative valence ($\lambda$ = -1). Prosocial emotions emanating from the cooperative affect system that infuse the C and A domains would be coded with positive valence ($\lambda$ = 1). Heterostatic control, which has an event rather than spatial focus, can be coded with neutral valence ($\lambda$ = 0).

As part of the socialization process, the cooperative and individualistic affect subsystems should operate antagonistically (Hamilton, 2012; Hamilton et al., 2008). The l subordination effect codes facilitate a test of the antagonism thesis. At the core stratum, the antagonism thesis reflects the psychodynamic tension between the id and super-ego structures, teleologically controlled by the ego. Goal-specific balance can be obtained via the cognitive regulation of emotion.

## 2.3 Predicting Effects within and between Domains

The cybernetic flux engine predicts effects between and within domains as they appear in Figure 1. These are expected values based on a re-analysis of four early Cattell-Digman studies (Hamilton, 2026). The sagittal cross-section is a view down the x-axis so that the relationships among all six domains are visible. Three of the six domains within the engine are bifurcated, shown with an identifiable functional coordinating substructure. Cattell (1957) proposed that O is a function of Intellect, symbolized here as O(I). DeYoung et al. (2007) estimated the I-O link to be rather large ($\vec{r}$= .41) across two samples. The findings from DeYoung et al. (2007) suggest that the aspect Enthusiasm (E1) had a large positive effect ($\vec{r}$ = .51) on Assertiveness (E2). Following Cattell (1957), the engine in Figure 1 also predicts that Aggressiveness (P2) will follow from Eclectic Dominance (P1). This coordinating effect is anticipated to be somewhat smaller in magnitude (r = .38).

Eysenck (1992) offers a P model (his Figure 1a) with a vertical bifurcation line distinguishing a leading cluster composed of coldness, Machiavellianism, and hostility from a trailing cluster composed of aggression and low empathy. An alignment more compatible with the well-established Dark Triad (Paulus & Williams, 2002) would be to associate P1 with psychopathy, narcissism, and Machiavellianism while associating P2 with hostility and aggression. In both bifurcations of P, aggressiveness (P2) should be a function of psychopathy (P1).

**2.3.1 Socialization Effects between Domains**

The socialization process appears along the x-axis in Figure 1, following Digman (1963). DeYoung, et al. (2002) recast this structure as a more hierarchical than reticular process, calling it a stability metatrait. They hypothesize that the N, A, and C domains are spuriously correlated because of the common causal antecedent (CCA) neurotransmitter serotonin (DeYoung et al., 2002). That is, a 5-HT deficit should increase N while decreasing A and C. By contrast, the socialization process in the cybernetic flux engine is mainly neuroelectric, generating reticular effects. The cybernetic engine differentiates the socialization process into two feedback loops (Hamilton, 2026). Integrating data from DeYoung et al (2007), the original directional steering circuit appears to be a risk management circuit, and the original intensity management circuit appears to be a social dominance circuit. The directional steering and intensity management circuits were taken as gated and therefore sequential. The risk management and social dominance circuits, by contrast, would operate in parallel. In the risk management circuit, the C→N effect should be inhibitory, as the main influence of socialization. Consistent with the antagonism thesis, C has a somewhat small negative expected value on N ($r = -.19, \pm .10$). In the social dominance circuit, the P domain requires bifurcation into two aspects. The P1→A effect is negative (estimated as $r = -.19$, McCrae & Costa, 1985). This effect supports the antagonism thesis. The observed A→P2 ($r = .12$) effect would amount to an emotional justification of aggressiveness, as described in BST (Hamilton & Mineo, 1999).

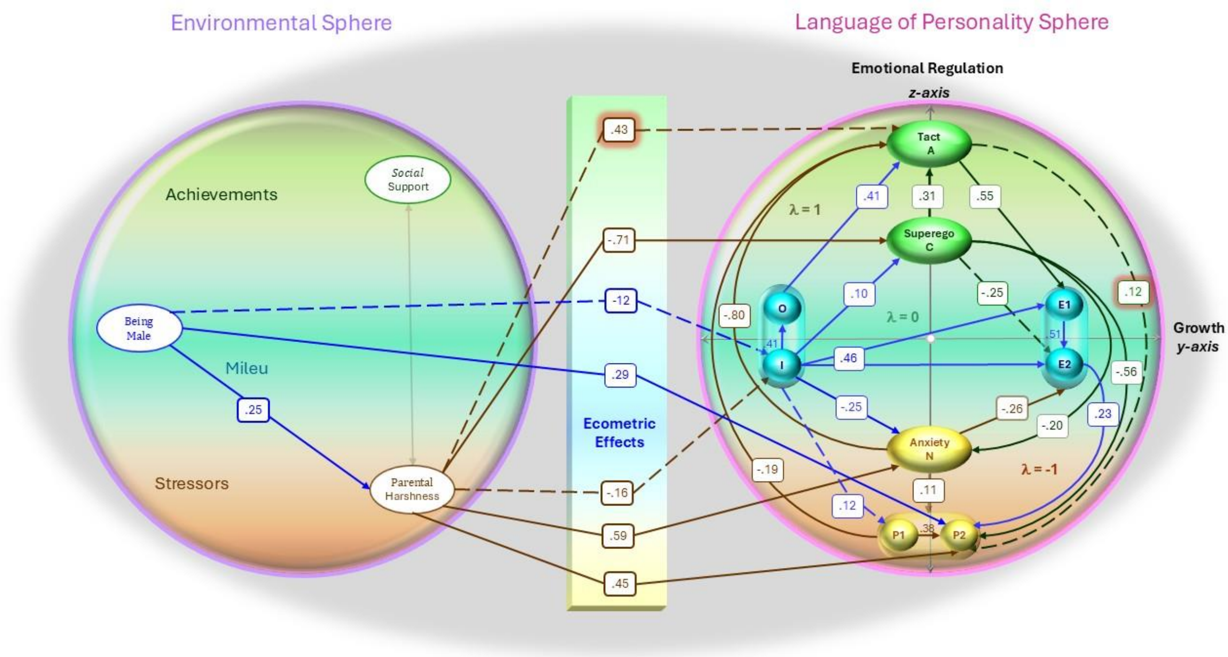


Figure 1. Test of the Stratoplex Model with Early Foundational Digman Data on the Language of Personality Sphere (LPS) and Environmental Sphere (ES).

Across the four initial tests of the engine (Hamilton, 2026, Figures 1 and 2), two short circuits were identified that could potentially disrupt LPS heterostasis. The overloads occur as arcing from the risk management C-N circuit to the social dominance P-A circuit. The C arcing differed between the two aspects of P. Consistent with the antagonism thesis and the inhibition of aggression by authority, the C→P2 effect was negative and very large ($\rho$ = -.56). The N arcing may be personally catastrophic. The N→A effect has a large negative expected value ($\rho$ = -.49), although with vast heterogeneity (± .31). The mindset behind this arc would be *neurotic alienation*, with the potential consequences of social withdrawal, isolation, and loneliness.

Finally, the engine in Figure 1 proposes that Assertiveness (E2) would have a positive effect on Aggressiveness (P2). The Digman (1963) data suggest this effect would be of modest size ($r$ = 23). This finding is exactly consistent with the BST prediction that argumentativeness increases verbal aggressiveness ($\rho$ = .23), an antecedent to physical aggression (Hamilton & Mineo, 2002), and is tantamount to the rational justification of aggression.

### 2.3.2 Personal Growth Effects between Domains

The personal growth process appears along the y-axis in Figure 1, following Digman (1963). As with the N, A, and C metatrait, DeYoung, et al. (2002) recast the O(I) and E structure as more of a hierarchical than reticular process, calling it the plasticity metatrait. They hypothesize that O and E domains are spuriously correlated because of the CCA neurotransmitter dopamine. As DA increases, so should O and E (DeYoung et al., 2002). By contrast, the personal growth process in the cybernetic flux engine is mainly neural, generating reticular effects. The expected value of the O(I)→E effect is positive r = .32, although with substantial variation (± .23). Correlations reported by DeYoung, et al. (2007) suggest that I rather than O is the driver of both aspects of E, as depicted in Figure 1.

Besides the O(I)→E progression, there are two other progressions that might promote personal growth by grounding the N-A and C-P short circuits, acting as a kind of neuroelectric "jumper" to stabilize the system. The N→P ego-defensive progression has a small positive expected value (r = .11, ± .08). The C→A affiliative progression is notably larger, with a positive expected value (r = .32, ± .32). Stability is therefore more likely to be obtained by affiliation rather than ego-defensive maneuvers.

**2.3.3 Emotional Regulation Effects between Domains**

The emotional regulation process appears as the z-axis of Figure 1. In the Sagittal cross-section shown, the viewer is looking downward along the z-axis, so it is depicted as an arrowhead dot. Within hierarchical models, the cognitive control of emotions in response to ecometric effects from the ES has been suggested as a g metatrait (Digman, 1963; Hamilton, 2026). Figure 1 characterizes input from the ES as falling under the rubric of stressors, achievements, or the milieu. As a form of social undermining, parental harshness should fuel individualistic affect, increasing both N (r = .59) and P (r = .45). Parental harshness may also have a somewhat small negative effect on O(I), r = -.16, and foment rebellion by massively decreasing C (r = -.71). Surprisingly, parental harshness may foster A (r = .43) as a way of mollifying the hostile parent. As part of the milieu, male sex should increase feelings of hostility and promote aggressiveness (r = .29), given that a harsh parent is often tougher on boys than girls.

Emotional regulation involves the control of emotional experience as well as emotional expression (Gross, 1998). The risk management and social dominance circuits appearing in Figure 1 generate asymmetric indirect effects for the impact of I and O on E1 and E2. Correlations reported by DeYoung, et al. (2007) suggest that there are both direct and indirect effects of I on Assertiveness (E2). The C and N domains should perform an avoidance-weighted appraisal of danger, potential loss, and threats to emotional regulation. Hence, a distinguishing feature of the risk management circuit is that both the C and N domains diminish Assertiveness (E2). Given infusion from the cooperative affect system, the expected value of the I→C effect should be positive (ρ = .10, *SD* = .16), with C having a modest negative effect (ρ = -.25, ± .33) on Assertiveness (E2). Given infusion from the individualistic affect system, the expected value of the O(I)→N effect is somewhat negative (ρ = -.18, ± .20). The expected value of the N→E effect based on the four earlier tests of the engine was positive but small (ρ = .08, ± .20). But this expected value depends heavily on the Digman (1963) result. Data from Digman's own meta-analysis show a negative N→E effect across the four age cohorts ($\vec{r}$ = -.26).

In the social dominance circuit, the motivation to dominate others, emanating from Eclectic dominance (P1), suppresses A because empathy is an obstacle to obtaining supremacy. This provides an emotional justification for Aggressiveness (P2). The impact of I on Assertiveness (E2) mediated by A is further complicated by additional mediators. That is, the impact of I on A appears mediated by O, and the impact of A on Assertiveness (E2) appears mediated by Enthusiasm (E1). Hence, as part of the social dominance circuit, both the P and A domains diminish Assertiveness (E2). Given infusion from the cooperative affect system, the expected value of the O(I)→A effect should be positive (ρ = .14, ± .27). In turn, the expected value of the effect of A on Assertiveness (E2) should also be positive (ρ = .59, ± .04). The expected value of the O(I)→P1 effect was positive but small (ρ = .10, ± .12). Notably, the trailing aspect of the P domain, Aggressiveness (P2), does not mediate the impact of O(I) on E.

## 3. Methods

Retrospective causal modeling of four formative datasets was used to test the reticular structures of the stratoplex with the cybernetic flux engine retrofit. In accordance with the Pearson-Cattell Primacy of Intellect (POI) thesis, intellect should be a driver of the other domains. One limitation to the Hamilton (2026) tests was that the one and only sample of adults was small (N = 100). To address this limitation, the studies covered in the current research were all from adults and much larger. The first pair of case studies used the 16PF Instrument. Early on, Cattell (1957) was making his case for structured systems theory. This was from a time when Cattell's influence had reached its peak but before he formally proposed the stratoplex. The second pair of case studies used the Big Five Instrument.

The two-stage least-squares causal modeling program PATH 6.1 (Hunter & Hamilton, 2002) was used to re-analyze the correlational data from the four case studies. If the reliability of the personality traits has been estimated, the program can correct attenuation due to measurement error. The program also reports Root Mean Square Residual (RMSR) to describe overall goodness of fit as well as various inferential indicators. As in Hamilton (2026), O(I) was taken to be an anchoring mediator variable in each case so that downstream effects could be tracked.

The 16PF researchers collected their data for the first pair of studies in 1956 and 1958. The studies had participants rate themselves. Following precedent (Costa & McCrae, 1976, 1978; Hamilton, 2026), MGCA was used for all levels of the LPS measurement model. This avoids the attenuation due to EFA hyperplane restrictions. As specified by Cattell and Cattell (1995), first-order factors (as items) were assigned to second-order factors (as latent variables). Their reliability estimates were then used to correct for attenuation due to measurement error. Data for the second pair of studies, often referenced as ground-breaking for Big Five theory, were collected by Norman (1961) and Borgata (1964). Re-analysis of the initial studies by Cattell and Digman (see Hamilton, 2026) suggested that the data Digman collected were more supportive of the stratoplex than the data that Cattell collected. The re-analysis of four more studies subjected this possibility to further scrutiny.

### 3.1 Testing the Stratoplex

The first examination of the stratoplex was based on correlational data from Cattell (1956), with a sample consisting of 635 adults. The domain-level factors extracted by MGCA included Self-control (C domain), Intellect (O domain), Extraversion (E domain), Anxiety (N domain), and Eccentric dominance (P domain). The correlation matrix provided by Cattell (1957) did not include his Cultured Tact (A domain). The second examination of the stratoplex was based on correlational data from Levonian (1961). Their sample consisted of 252 students attending the University of California, Los Angelos in 1958. The students responded to 16PF items that were scored dichotomously.

The third test of the stratoplex framework was based on correlational data from Norman (1961). The sample consisted of 455 adults. Scores were based on self-ratings. The available correlations included the O, C, N, A, and E domains but not the P domain. The fourth test case of the stratoplex framework was based on data from Borgotta (1964). The sample consisted of 457 adults (69% female). Scores were based on self-ratings. The available correlations included the O, C, N, A, and E domains but not the P domain. An earlier study by Borgotta (1960) found correlations among three traits Emotionality (N), Sociability (A), and Assertiveness (E). Applied to the stratoplex, the N→A effect was r = -.22, the A→E effect was r = .19, and the N→E effect was r = -.17.

## 4. Results

Reticular models are, by definition, highly connected and therefore have low degrees of freedom when researchers examine model fit. Across the four case studies, the overall goodness of fit ranged from excellent to exceptional. This finding suggests that the LPS has a general coherence and stability. Hence, the stratoplex with its cybernetic flux engine remains a viable account of the processes occurring inside the LPS. Strength of support for the proposed socialization, personal growth, and emotional regulation processes varied by whether the data came from the 16PF or the Big Five.

### 4.1 Case Study 1: The Cattell Amalgamated Sample

The best fitting model for this data appears on the left in Figure 2. The overall fit was exceptional: *RMSE* = .022, *RMSEA* = 0, $\chi^2(2) = .33$, *p* = .84. In the proposed risk management circuit of the socialization process, Self-Control (C) decreased Anxiety (N); this effect was slightly larger than expected (ρ = -.24). Self-Control (C) increased Eccentric Dominance (P1), with the obtained value (ρ = .10) almost exactly equal to the predicted value. As Cattell theorized, Anxiety increased Eccentric Dominance (ρ = .16), an effect slightly higher than expected. Psychodynamic theorists would interpret this effect as an unconscious shift from less to more severe ego-defenses.

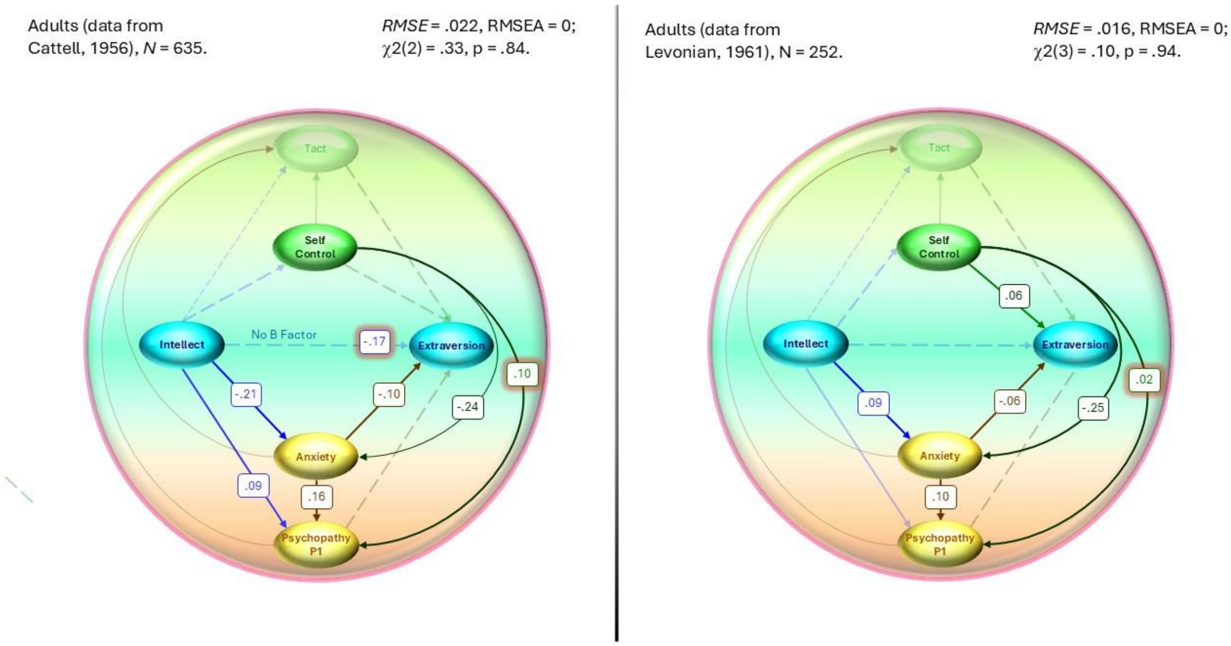


Figure 2. Test of the Stratoplex Model with Early Foundational 16PF Data.

The proposed growth process was not supported, with Intellect *decreasing* Extraversion (ρ = -.17). This finding was due to the unusual measure of intellect, which excluded Cattell's B aspect (Intelligence). The cognitive control of emotions was examined with two tests. Intellect decreased anxiety by ρ = -.21, which was close to the expected value. And anxiety decreased extraversion (ρ = -.10); this finding is more in line with meta-analytic findings (see Ones, 1993) than the positive expected value from the Digman (1963) study.

### 4.2 Case Study 2: The UCLA Sample

The best fitting model for the Levonian data can be found on the right in Figure 2. As with the first test, this model had exceptional fit: *RMSE* = .016, *RMSEA* = 0; $\chi^2(3) = .10$, *p* = .94. In the hypothesized risk management circuit, Self-Control (C Domain) had a negative effect (ρ = -.25) on Anxiety (N), which was slightly larger than expected. The observed positive effect (ρ = .02) of Self-Control on Eccentric Dominance (P1) was smaller than expected. There was additional support for the hypothesized psychodynamic ego-defense progression in which Anxiety increases Eccentric Dominance (ρ = .10); this value was almost exactly as expected.

The Levonian data did not support the proposed growth process: there was no detectable direct effect of Intellect on Extraversion. Only one of the three tests concerning the cognitive control of emotion was in line with predictions. Intellect had a small positive effect on Anxiety (ρ

= .09), which was contrary to expectations. Anxiety slightly decreased Extraversion (ρ = -.06), as in the Cattell (1956) data. Finally, Self-control had a tiny positive effect on Extraversion (ρ = .06), which was contrary to expectations and was likely due to sampling error.

### 4.3 Case Study 3: The Revered Norman Data

The best fitting model for this data appears on the left in Figure 3. It had exceptional fit: *RMSE* = .022, *RMSEA* = 0, $\chi^2(1)$ = .12, *p* = .73. As a test of the hypothesized risk management, circuit, the C→N effect was positive (ρ = .06), contrary to expectations. However, the N→A "catastrophic" short circuit effect was large (ρ = -.47). The affiliative progression, which would stabilize the LPS in the presence of a catastrophic short circuit, received strong support. The C→A effect was large (ρ = .45), in the direction and magnitude of expectations.

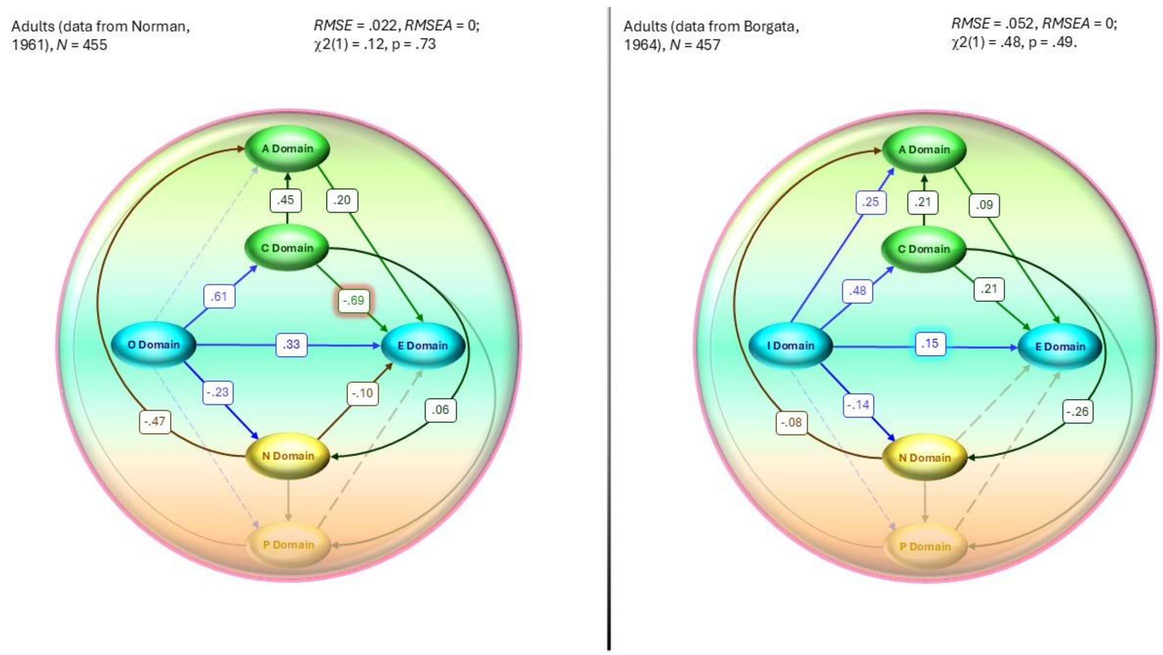


Figure 3. Test of the Stratoplex Model with Early Foundational 16PF Data.

Consistent with the proposed growth process, the O→E effect was nearly identical to the expected value (ρ = .33). There were six tests of the emotion regulation process. Consider the domains in the risk management circuit first. The O→C effect was positive and very large (ρ = .61), with the C→E effect negative and massive (ρ = -.69). Thus, the indirect effect of O on E mediated by C was somewhat large (-.42). The O→N effect was negative as expected (ρ = -.23), with the N→E effect again negative (ρ = -.10), matching the expected value. Next, consider the domains in the social dominance circuit. The predicted O→A effect was not detectable, with the

A→E effect positive but limited in size (ρ = .20). Thus, there was no indirect effect of O on E mediated by A.

### 4.4 Case Study 4: New York University Data

The best fitting model for this data appears on the right in Figure 3. It had excellent fit: *RMSE* = .052, *RMSEA* = 0; $\chi^2(1) = .48$, $p = .49$. The risk management circuit, the negative C→N effect (ρ = -.26) was in line with expectations. There was a small "catastrophic" short circuit, with the negative N→A effect (ρ = -.08), which was smaller than expected. The study allowed another test of the affiliative progression, with a positive C→A effect (ρ = .21) that was a bit smaller than expected.

Supporting the proposed growth process, the O→E effect was positive (ρ = .15) but smaller than expected. There were four tests of the emotional regulation process. Consider the two domains in the risk management circuit first. The O→C effect was positive (ρ = .48), with an expected positive C→E effect (ρ = .21). The O→N effect was negative (ρ = -.14), although the N→E effect was not present. Next, consider the A domain in the social dominance circuit. As expected, the O→A effect was positive (ρ = .25), as was the A→E effect (ρ = .09).

## 5. Discussion

The stratoplex framework in Figure 1 proposes that ecometric pressure from profound stressors and achievements in the ES introduces flux into the LPS, directly influencing multiple domains. The cybernetic engine maintains that ecometric pressure reverberates as rapid and localized domain effects inside the LPS. The engine also maintains that endometric pressure introduces flux as feedback to the ES. Domains can then indirectly influence other domains, although these pervasive effects are sufficiently delayed and diffuse that they will be more challenging to detect. Emotional regulation is supposed to contribute to heterostatic control of the LPS as emotional experience and emotional expression.

The two studies using 16PF (Figure 2) showed exceptional fit but mixed support for specific stratoplex predictions. The 16PF data did show support for a risk management circuit, supporting a negative C→N effect and a shorting positive C→P effect. The small but consistent N→P effect would stabilize this shorting effect. But the 16PF data did not show any support for a positive O(I)→E effect. Of the various emotional regulation effects, only the negative N→E effect was consistent. The two studies using Big Five data (Figure 3) showed excellent fit and had a better match with the expected values in Figure 1. The personal growth process received strong support with consistent O(I)→E effects, but the socialization process was less robust. The Big Five data showed mixed support for a risk management circuit. The negative C→N effect was present in the Borgata data but turned slightly positive in the Norman data. The "catastrophic" shorting negative N→A effect was present for Norman (1961) and Borgata (1964) as well as the Borgotta (1960) data described earlier. A solidly consistent C→A effect would stabilize this shorting effect. Of the possible emotional experience effects, the O→C and O→N effects replicated. Of the possible emotional expression effects, only the negative A→E effect replicated.

The MGCA factor-cluster method of Tryon, originating with Thurstone, consistently yields stronger correlations among deep source factors. These larger correlations are more compatible with structured systems theory. By comparison, Cattell's projection-based simple structure EFA rotation, either by hand or ROTOPLOT, applies hyperplane limits and the principle of multiple determination, leading to lower deep source correlations. Nonetheless, the Cattell 12 to 16 factor extractions provided a first clue about the nature of trait coordination in the LPS.

**5.1 The Dual-Circuit Socialization Process**

The cybernetic flux engine presented here proposes a socialization process organized as two parallel circuits. The risk management circuit initiates with the negative C→N effect, which has been present in each of the eight cases studied ($\bar{\rho}$= -.18, SDr = .119). This flags the .06 effect in the Norman data as a marginal outlier (at greater than 2 *SD*s). Excluding the Norman data, the average C→N effect ($\bar{\rho}$= -.22) was still modest. The hypothesized negative N→C effect (see Chang, Connely, and Geeza, 2012) would complete the risk management circuit. The social dominance circuit initiates with the negative P→A effect. In the PF16 data, this would be the negative impact of Eclectic dominance (P domain) on Cultured tact (A domain). Unfortunately, across the eight studies, the 16PF data omit the A domain, and the Big Five studies omit the P domain. The hypothesized negative A→P effect (see Costa & McCrae, 1992) would complete the social dominance circuit.

The two coils of the socialization process have the potential for two short circuits. The "catastrophic" negative N→A effect was present in all four Big Five studies ($\bar{\rho}$= -.38), although the substantial variation across studies (SDr = .32) suggests a moderator is present. This shorting effect would be grounded by the affiliative progression, the C→A effect ($\bar{\rho}$= .43), although the substantial variation across studies (SDr = .21) also suggests a moderator is present.

The C→P1 effect was weakly present across the four 16PF studies ($\bar{\rho}$= .08, SDr = .04). This conscience-driven eclectic dominance warrants further investigation because the C→P2 effect is estimated to be negative and large (r = -.56). Psychodynamic theory predicts that excessive stress will elicit an unconscious ego-defensive progression (Freud, 1949). Among the four 16PF studies, Anxiety persistently increased Eccentric Dominance ($\bar{\rho}$= .15, SDr = .03) but they did not measure aggressiveness. This finding reinforces the value of bifurcating the two aspects of P, and to specify the domain's coordinating sequence as eclecticism through dominance leading to aggressiveness.

**5.2 Variation in the Personal Growth Process**

The personal growth process initiates with the positive O(I)→E effect (Digman, 1997) that should be prompt, producing contained activation. Excluding the Cattell (1957) study that had an Intellect operationalization defect, the group of seven remaining studies show support for the proposed positive O→E effect ($\bar{\rho}$= .25). There was, however, substantial heterogeneity across studies (SDr = .20). The O→E effect for the three 16PF studies ($\bar{\rho}$= .09) was substantially smaller than that for the Big Five studies ($\bar{\rho}$= .37). Ironically, the Big Five data show much stronger support for the stratoplex than the 16PF data. The hypothesized positive E→O effect (see Chang et al., 2012) would complete the growth process, although gradually, by spreading activation through the ES. Figure 1 specifies that I rather than O that drives both Enthusiasm (E1) and Assertiveness (E2).

**5.3 The Cognitive Control of Emotional Experience and Expression**

Researchers may find the most compelling evidence for differentiating the socialization process into two circuits in the emotional regulation process. Consider the control of emotional *experience* in the risk management circuit. Across the eight studies, the O(I)→C effect was positive ($\bar{\rho}$= .19) but the effects were heterogeneous ($SD_r$ = .25). The O(I)→C effect for the 16PF studies was zero with no variation. The O(I)→C effect for the Big Five studies was quite positive ($\bar{\rho}$= .38). Across the eight studies, the O(I)→N effect was small ($\bar{\rho}$= -.15) but the effects were somewhat heterogeneous ($SD_r$ = .15). For the 16PF data, O(I)→N effect was still negative ($\bar{\rho}$= -.07) but rather heterogeneous ($SD_r$ = .18). For the Big Five data, O(I)→N effect was more negative ($\bar{\rho}$= -.24) and homogeneous ($SD_r$ = .07). For emotional experience, the Big Five data show much stronger support for the stratoplex than the 16PF data.

Consider first the control of emotional *expression* in the risk management circuit. Across the eight studies, the C→E effect was negative ($\bar{\rho}$= -.18) but the effects were extremely heterogeneous ($SD_r$ = .35). The C→E effect for the 16PF studies was effectively zero ($\bar{\rho}$= .02) with almost no variation. The C→E effect for the Big Five studies was quite negative ($\bar{\rho}$= -.37). Across the eight studies, the N→E effect was small ($\bar{\rho}$= .01) with effects somewhat heterogeneous ($SD_r$ = .15). This heterogeneity was due to the positive .36 value from the Digman (1963) study. With that study excluded, the N→E across the remaining seven studies was slightly negative ($\bar{\rho}$= -.04) and homogeneous ($SD_r$ = .05). It should be noted that in her comprehensive meta-analysis, Ones (1993) found a larger but still small N→E correlation of -.14. Thus, for the risk management circuit, both the C→E and N→E effects are likely negative.

Now consider the control of emotional *experience* in the social dominance circuit. Across the four 16PF studies, the O(I)→P1 effect was positive ($\bar{\rho}$= .07) with a marginal degree of heterogeneity ($SD_r$ = .11). Across the four Big Five studies, the O(I)→A effect was positive ($\bar{\rho}$= -.13) but the effects were quite heterogeneous ($SD_r$ = .25). Now consider the control of emotional *expression* in the social dominance circuit. In each of the four 16PF studies, the P1→E effect was zero. However, the E→P2 effect was positive (r = .32). Across the four Big Five studies, the A→E effect was quite positive ($\bar{\rho}$= .37) with heterogeneous effects ($SD_r$ = .25). It is intriguing that both the O(I)→A and A→E effects are positive with the same amount of heterogeneity. It may be that age moderates the role of the A domain in the stratoplex. Future studies should examine LPS dynamics across cohorts, as Digman (1997) recommended.

# References


Ashton, M. C., Lee, K., Anglim, J., Bucher, M. A., Horwood, S., & Samuel, D. B. (2023). The HEXACO personality space before and after re-rotation to approximate the Big Five dimensions. Journal of Personality.

Borgatta, E. F. (1960). The stability of interpersonal judgments in independent situations. *The Journal of Abnormal and Social Psychology*, *60*(2), 188–194. https://doi.org/10.1037/h0040917

Borgatta, E. F. (1962). The coincidence of subtests in four personality inventories. The Journal of Social Psychology, 56(2), 227–244. doi.org

Borgatta, E. F. (1964). The structure of personality characteristics. *Behavioral Science*, *9*(1), 8–17.

https://doi.org/10.1002/bs.3830090103

Cattell, R. B. & P. Cattell, H. E. (1995). Personality Structure and the New Fifth Edition of the 16PF. Educational and Psychological Measurement, 55(6), 926-937. https://doi.org/10.1177/0013164495055006002

Cattell, R. B. & P. Kline, P. (1977). The Scientific Analysis of Personality and Motivation. New York: Academic Press.

Cattell, R. B. (1943). The description of personality. I. Foundations of trait measurement. Psychological Review, 50(6), 559–594.

Cattell, R. B. (1946). *Description and measurement of personality.* World Book Company.

Cattell, R. B. (1950). *Personality: A systematic theoretical and factual study* (1st ed.). McGraw-Hill.
https://doi.org/10.1037/10773-000

Cattell, R. B. (1956). Second-order personality factors in the questionnaire realm. *Journal of Consulting Psychology*, *20*(6), 411–418. https://doi.org/10.1037/h0047239

Cattell, R. B. (1957). *Personality and motivation structure and measurement.* World Book Co..

Cattell, R. B. (1965) 'Higher order factor structures and reticular-vs-hierarchical formulae for their interpretation,' in *C. Banks and Broadhurst* (eds.), Studies in psychology London: University of London Press, 223-66.

Cattell, R. B. (1979). *Personality and Learning Theory*, Vols. 1. New York: Springer.

Cattell, R. B. (1986). The 16 PF personality structure and Dr. Eysenck. *Journal of Social Behavior & Personality*, *1*(2), 153–160.

Cattell, R. B., & Digman, J. M. (1962). A theory of the structure of perturbations in observer ratings and questionnaire data in personality research [Technical Report].

Cattell, R. B., Pierson, G. & Finkbeiner, C. (1976). Alignment of personality source trait factors from questionnaires and observer ratings: The theory of instrument-free patterns. *Multivariate Experimental Clinical Research, 2*(2), 63–88.

Chang L, Connelly B.S., Geeza A.A. Separating method factors and higher order traits of the Big Five: a meta-analytic multitrait-multimethod approach. J Pers Soc Psychol. 2012 Feb;102(2):408-26. doi: 10.1037/a0025559.

Costa, P. T., & McCrae, R. R. (1992). The five-factor model of personality and its relevance to personality disorders. Journal of Personality Disorders, 6(4), 343–359. https://doi.org/10.1521/pedi.1992.6.4.343

Costa, P. T., Jr., & McCrae, R. R. (1976). Age differences in personality structure: A cluster analytic approach. Journal of Gerontology, 31(5), 564–570. https://doi.org/10.1093/geronj/31.5.564

Costa, P. T., Jr., & McCrae, R. R. (1984). Personality as a lifelong set of traits. (Specific book or publication details may vary depending on your exact context, such as their work in the Review of Personality and Social Psychology).

DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2002). Higher-order factors of the Big Five predict conformity: Are there neuroses of health? Personality and Individual Differences, 33(4), 533–552. https://doi.org/10.1016/S0191-8869(01)00171-4

DeYoung, C. G., Quilty, L.C. & Peterson, J.B. (2007). Between facets and domains: 10 aspects of the Big Five. J Pers Soc Psychol. 2007 Nov;93(5):880-96. doi: 10.1037/0022-3514.93.5.880. PMID: 17983306.

Digman, J. M. (1963). Principal dimensions of child personality as inferred from teachers' judgments. *Child Development*, *34*, 43-60.

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology*, *73*(6), 1246–1256. https://doi.org/10.1037/0022-3514.73.6.1246

Draycott, S. G., & Kline, P. (1995). The Big Three or the Big Five—the EPQ—R vs the NEO-PI: A research note, replication and elaboration. *Personality and Individual Differences*, *18*(6), 801–804. https://doi.org/10.1016/0191-8869(95)00010-4

Eysenck, H.J. (1992). A reply to Costa and McCrae. P or A and C—the role of theory. Personality and Individual Differences, 13, 867-868. ISSN 0191-8869, https://doi.org/10.1016/0191-8869(92)90003-8

Freud, S. (1943). A general introduction to psychoanalysis. Garden City Publishing Co, Garden City, New York.

Galton F. (1884). Measurement of character. *Fortnightly Review*, 36, 179–185.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Hamilton, M. A. & Mineo, P.J. (1996). Personality and persuasibility: Developing a multidimensional model of belief systems. *World Communication, 24,* 1-16.

Hamilton, M. A. & Mineo, P.J. (1999). Self-worth and negative affect as antecedents to the authoritarian justification of conservatism rigidity. *Politics, Groups, and the Individual, 8,* 85-110.

Hamilton, M. A., & Mineo, P. J. (2002). Argumentativeness and its effect on verbal aggressiveness: A meta-analytic review. In M. Allen, R. W. Preiss, B. M. Gayle, & N. A. Burrell (Eds.), Interpersonal communication research: Advances through meta-analysis (pp. 281–312). Lawrence Erlbaum Associates.

Hamilton, M. A. & Veksler, A. E. (2014). Types of stress and their effects on mental health, verbal aggression, and assault. In J. Honeycutt (Eds.). *The Influence of Communication in Physiology and Health Status*. New York, NY: Peter Lang Publishers.

Hamilton, M. A. (1997). The phase interfaced omnistructure underlying the processing of persuasive messages. In F. J. Boster & G. A. Barnett (Eds.), Progress in communication science (pp. 1–38). Ablex Publishing.

Hamilton, M. A. (2012)**.** Verbal aggression: Understanding the psychological antecedents and social consequences. *Journal of Language and Social Psychology, 31*, 1-8.

Hamilton, M. A. (2026). Development of the language of personality sphere: Historical evidence for intellect's role in hierarchical-reticular models. Intelligence, 113, Article 101824.

Hamilton, M. A., Buck, R., Chory, R. M., Beatty, M. J., & Patrylak, L. (2008). Selfish individualistic and prosocial cooperation as antecedents to verbal aggression and cooperativeness. In M. Beatty & J. McCroskey (Eds.). A*dvances in Communication Research: Biological Perspectives* (227-250). Creskill, NJ: Hampton Press.

Heaven, P. C. L., Ciarrochi, J., Leeson, P., & Barkus, E. (2013). Agreeableness, conscientiousness, and psychoticism: Distinctive influences of three personality dimensions in adolescence. *British Journal of Psychology, 104*(4), 481-494.

Hunter, J. E., & Hamilton, M. A. (2002). Path 6.0: A program to perform least squares path analysis (Version 6.0) [Computer software]. Available from Mark Hamilton, University of Connecticut, Storrs.

Levonian, E. (1961). A statistical analysis of the 16 personality factor questionnaire. Educational and Psychological Measurement, 21(3), 589–596.

Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. The Journal of Abnormal and Social Psychology, 66(6), 574–583. doi.org

Ones, D. S. (1993). *The construct validity of integrity tests* (Doctoral dissertation). University of Iowa. Retrieved from https://search.proquest.com/docview/304061228

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism and psychopathy. Journal of Research in Personality, 36(6), 556–563.
https://doi.org/10.1016/S0092-6566(02)00505-6

Pawlik, K., & Cattell, R. B. (1964). Third-order factors in objective personality test. British Journal of Psychology, 55(1), 1–18.
https://doi.org/10.1111/j.2044-8295.1964.tb00893.x.

Rokeach, M. (1960). *The open and closed mind.* Basic Books.

Rokeach, M. (1968). Beliefs, attitudes, and values: a theory of organization and change. San Francisco : Jossey-Bass, 1968.

Scherer, K. R. (1984). On the nature and function of emotion: A component process approach. In K. R. Scherer & P. Ekman (Eds.), Approaches to emotion (pp. 293–317). Lawrence Erlbaum Associates.

Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), Appraisal processes in emotion: Theory, methods, research (pp. 92–120). Oxford University Press.

Thurstone, L. L. (1934). The vectors of mind. *Psychological Review, 41*(1), 1–32.
https://doi.org/10.1037/h0075959

Tryon, R. (1939). *Cluster analysis.* Edwards Bros.

Tryon, R. C. (1959). Domain sampling formulation of cluster and factor analysis. *Psychometrika, 24,* 113–135. https://doi.org/10.1007/BF02289824

Von Bertalanffy, L. (1950). An outline of general system theory. *British Journal for the Philosophy of Science*, *1,* 134–165. https://doi.org/10.1093/bjps/I.2.134