

Measuring Both Ends of the Big 5 Personality Scales Independently

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Abstract

This paper outlines the development of a tool that integrates advancements in personality theory. Big Five personality theory guided the inductive development of 10 scale pairs in the new measure representing the two poles of each Big Five factor. The 10 scale pairs have been further broken down into 32 facets. Factor Analysis of the 32 facets based on an international sample of 2,158 people from a mixed working population replicates the Big Five Factor structure well. Results show that measures of behavior at both ends of the Big Five scales can be created and that the Big Five factor structure persists.

Keywords: Big Five, factor analysis, inductive, deductive, bifurcate, mandala, circumplex

Introduction

1.1 Overview

The purpose of the research is to develop an integrated model of personality through the use of factor analysis to explore measurement of both ends of the Big Five polarities independently. This approach to measuring the Big Five aims to integrate both the traditional Big Five personality factors approach, and concepts drawn from Jungian psychology where both sides of the personality spectrum are conceptualized independently. This research aims to investigate the impact of bifurcating the Big Five personality factors into 10 independent personality scales.

1.2 Defining the Bifurcated Big Five Scales

A review of the literature on the Big Five was undertaken and a framework designed to create items to bifurcate and measure both ends of the Big Five polarities. This process involved defining the constructs through reviewing the many facets of the 5 factors in the literature, before hypothesizing how the bifurcation of the 5 factors would create 10 bi-polar scales. An example of the models reviewed is shown in Appendix 1. A key consideration in facet creation was maintaining a balance between socially desirable and more extreme descriptions of a trait. For example, 'takes charge' reflects the surgency component of extraversion and includes being persuasive (positively framed item) as well as becoming overly controlling (negatively framed item). The same number of positive and negatively framed items were created for each bifurcated end of the Big Five. This was to minimize any social desirability bias between the polarities and to reinstate the balance inspired by the Jungian approach where both ends are valued equally and of intrinsic value. A content validity study was undertaken with experts to assure content saturation and breadth. This resulted in 32 facets as detailed in Appendix 2.

1.3 Theoretical Objective

To separate the measurement of both poles of each Big Five personality construct, (rather than measuring using one continuous scale with one more ‘socially desirable’ end). For example, measuring extraversion as ‘socially bold’, and introversion as ‘contained and listening’, importantly enabling an individual to be potentially high (or low) on both.

1.4 Empirical Objective

To test whether the proposed model of personality is compatible with the Big Five structure.

Method

In a cross-sectional design $N=2,158$ participants from diverse occupational background were administered the new personality questionnaire through an online system which they self-rated on a five-point rating scale from “Strongly Agree” to “Strongly Disagree”.

The 32 facets were expected to form five factors that resemble the Big Five Factors following Principal Components Analysis with varimax rotation.

Results

Five factors were extracted accounting for 16.4%, 15.2%, 14.5%, 13.3% and 12.2% of the variance respectively. Table 1 shows the results of the Principal Components Analysis of the 32 facets of the newly developed personality model after varimax rotation. The resulting factor solution replicates the Big Five Factor structure. The first factor is called Risk Reactor / Reward Reactor and Risk Reactor aligns with the high end of the Neuroticism factor whilst Reward Reactor aligns with the low end. 4 facets are then used to measure each of these opposite ends. Following this approach, the second factor is labelled Introverted / Extraverted. This corresponds with the Extraversion factor and consists of 3 facets at each end. The third factor is Discipline Driven / Inspiration Driven consisting of 3 facets each and is matched with the Conscientiousness factor. The fourth factor is People Focused / Outcome Focused and also consists of 3 facets at the end of each pole. This aligns with the Agreeableness Factor. Finally, the fifth factor is Big Picture Thinking / Down To Earth and corresponds to the Openness to Experience factor, also comprising of 3 facets on each side.

As hypothesised, neurotic and emotionally stable items loaded on the same factor, but with opposite loadings. Similarly, Introversion and Extraversion items loaded on the same factor with opposite loadings. Agreeable and Disagreeable items followed the same pattern on their factor, as did conscientious and low conscientiousness items, as well as closed and open to experience items.

The data in Table 1 shows how the new model bifurcates the Big Five Factors into 10 scales that are in turn measured by 32 facets.

Table 1. Rotated components of PCA factor analysis of the new Personality measure ($N= 2158$)

	Factor 1 Neuroticism	Factor 2 Extraversion	Factor 1 Conscientiousness	Factor 4 Agreeableness	Factor 5 Openness
	Risk Reactors	Introversion	Discipline Driven	People Focused	Big Picture
	&	&	&	&	Thinking &
	Reward Reactors	Extraversion	Inspiration Driven	Outcome Focused	Down to Earth
Responsive	0.90				
Impassioned	0.88				
Vigilant	0.85				
Resilient	-0.84				
Even-tempered	-0.71				
Modest	0.70				
Optimistic	-0.70				
Confident	-0.58				
Observing		0.89			
Measured		0.89			
Sociable		-0.82			
Demonstrative		-0.81			
Intimate		0.65			
Takes Charge		-0.48		-0.45	0.41
Purposeful			0.88		
Flexible			-0.83		
Structured			0.82		
Reliable			0.82		
Spontaneous			-0.76		
Adaptable			-0.74		
Empathetic				0.84	
Tough				-0.78	
Accommodating				0.75	
Logical				-0.74	
Collaborative				0.74	
Competitive				-0.54	
Conceptual					0.85
Imaginative					0.84
Radical					0.76
Practical					-0.66
EvidenceBased			0.42		-0.57
Cautious			0.41		-0.52

Note. Component loadings < .40 omitted; Component loadings > .80 in **bold**.

4. Discussion

This approach to assessing the Big Five measures both ends of the big five factors separately.

Figure 1 shows how the newly developed personality measure can be arranged parsimoniously around what is termed a Mandala, that has been designed to represent four of the Big 5 factors which are typically covered in developmental HR applications. The factors are ordered to form a circumplex where People Focused through to Discipline Driven broadly represent Digman's (1997) Alpha Factor while Inspiration Driven to Outcome Focus represent the Beta factor. Emotional Stability (Reward Reactor) and Neuroticism (Risk Reactor) is covered through another Mandala (Figure 2). Combined, they make a powerful personality assessment tool that can be used in recruitment.

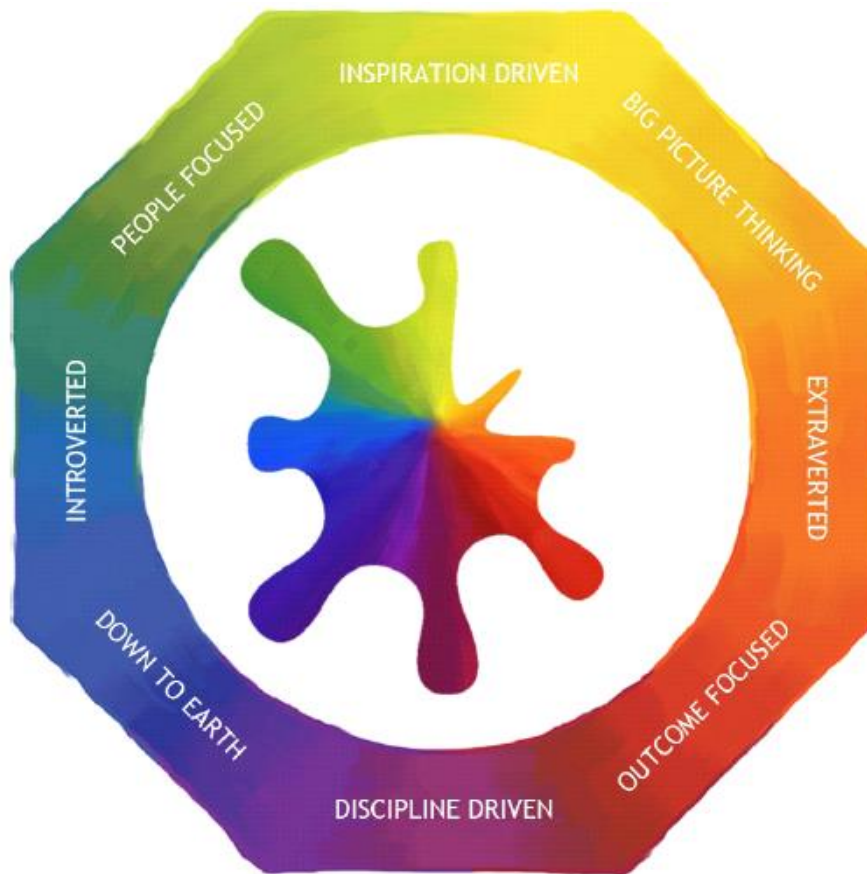


Figure 1. Mandala showing four bi-polar factors

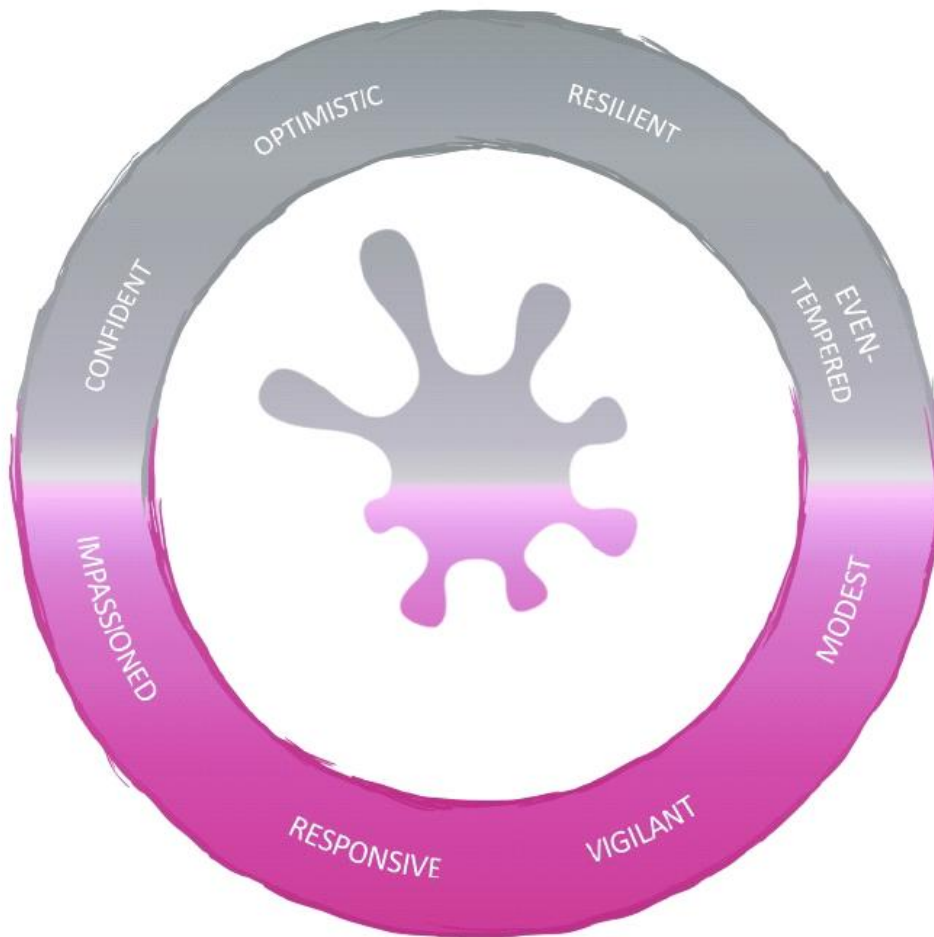


Figure 2. Mandala showing the neuroticism and emotional stability factor

Further research is being conducted to better understand the link between personality predictors and performance as conceptualised by the proposed bifurcated model. It will also be helpful to examine whether the features of the new measure can demonstrate improved criterion validity over and above the traditional Big Five construct through breaking out the Big Five factors to measure ‘both ends’ independently.

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Appendix 1 – Description of the 32 facets

Facet Scale	Description	Big Five Equivalent	Jungian Equivalent
Takes-charge	Assertive, takes the lead	+Extraversion	Extraversion
Sociable	Friendly, chatty, outgoing, gregarious	+Extraversion	Extraversion
Demonstrative	Expressive, enthusiastic, positive, energetic	+Extraversion	Extraversion
Measured	Contained, low-key, serious	- Extraversion	Introversion
Observing	Introspective, reserved, thinks before speaking	- Extraversion	Introversion
Intimate	Prefers listening, one-to-one's	- Extraversion	Introversion
Structured	Methodical, planned, Attention to detail	+Conscientious	Judging
Purposeful	Clear goals, proactive worker	+Conscientious	Judging
Reliable	Honours commitments	+Conscientious	Judging
Spontaneous	Acts on spur of moment, Follows instincts and impulses	- Conscientious	Perceiving
Adaptable	Emergent, laid-back	- Conscientious	Perceiving
Flexible	Prefers loose planning, avoids rigid structure	- Conscientious	Perceiving
Empathetic	Tender-minded, compassionate sympathetic	+Agreeableness	Feeling
Accommodating	Diplomatic, avoids conflict, consensus-seeking	+Agreeableness	Feeling
Collaborative	Supportive, trusting, cooperative, team-player	+Agreeableness	Feeling
Competitive	Competitive, shrewd	- Agreeableness	Thinking
Logical	Hard-nosed, objective, unsentimental	- Agreeableness	Thinking
Tough	Candid, straight-talking, direct	- Agreeableness	Thinking

Facet Scale	Description	Big Five Equivalent	Jungian Equivalent
Imaginative	Source of ideas, innovative	+Open to Experience	Intuition
Conceptual	Intellectually curious, abstract thinker, theoretical	+Open to Experience	Intuition
Radical	Takes risks, pushes boundaries, challenges status-quo	+Open to Experience	Intuition
Evidence Based	Likes to know the details, facts and evidence	- Open to Experience	Sensing
Practical	Focuses on the here and now, Realistic	- Open to Experience	Sensing
Cautious	Conservative, conventional, Sticks to tried-and-tested methods	- Open to Experience	Sensing
Impassioned	Mood fluctuates frequently, irritable, easily agitated	+Neuroticism	NA
Modest	Self-critical, lower-self-esteem, self-conscious	+Neuroticism	NA
Vigilant	Anxious, tense, worries what can go wrong	+Neuroticism	NA
Responsive	High sensitivity to stress	+Neuroticism	NA
Even-Tempered	Stable moods, calm, takes a lot to irritate or anger them	- Neuroticism	NA
Confident	Self-confident, self-assured	- Neuroticism	NA
Optimistic	Positive, easy-going, not easily discouraged	- Neuroticism	NA
Resilient	Handles stress and pressure well	- Neuroticism	NA

Appendix 2 – Overview of the 32 facets in relation to other models

Bifurcated Big Five 5 factors 32 facets	Saville Wave by Peter Saville 5 factors, 12 facets 36 sub-facets 108 sub-sub-facets	WPB5 by Pierce Howard 5 factors 24 facets	FACET5 from Consultingtools.com 5 factors 13 facets 17 types
Big Picture Thinking (O+) vs Down-to-Earth (O-) Radical vs Cautious Imaginative vs Evidence Based Conceptual vs Practical	Thought Evaluation Judgement Vision - 3 facets	Originality Preserver (O-) Moderate (O=) Explorer (O+) - 4 facets	Will Determination Confrontation Independence - 3 facets
Discipline Driven (C+) vs Inspiration Driven (C-) Reliable vs Spontaneous Structured vs Flexible Purposeful vs Adaptable	Delivery Implementation Structure Drive - 3 facets	Consolidation Flexible (C-) Balanced (C=) Focused (C+) - 5 facets	Control Discipline Responsibility - 2 facets:
Extraversion (E+) vs Introversion (E-) Takes charge vs Observing Expressive vs Measured Sociable vs Intimate	Influence Communication Impact Leadership - 3 facets	Extraversion Introvert (E-) Ambivert (E=) Extravert (E+) - 6 facets	Energy Vitality Sociability Adaptability - 3 facets
People Focused (A+) vs Outcome Focused (A-) Collaborative vs Competitive Empathetic vs Logical Accommodating vs Tough	Adaptability Support - 1 facet	Accommodation Challenger (A-) Negotiator (A=) Adapter (A+) - 5 facets	Affection Altruism Support Trust - 3 facets
Risk Reactor (N+) vs Reward Reactor (N-) Vigilant vs Optimistic Responsive vs Resilient Modest vs Confident Impassioned vs Even Tempered	Adaptability Flexibility Resilience - 2 facets	Need for Stability Resilient (N-) Responsive (N=) Reactive (N+) - 4 facets	Emotionality Anxiety Apprehension - 2 facets

Bifurcated Big Five 5 factors 32 facets	Quintax by Stuart Robinson. 5 factors, 25 types. 10 (5 x 2) poles creates 25 types	HPI by Robert Hogan 7 factors 41 facets	NEO-PI-R by Costa & McCrae 5 factors 30 facets
Big Picture Thinking (O+) vs Down-to-Earth (O-) Radical vs Cautious Imaginative vs Evidence Based Conceptual vs Practical	Intellectual Focus Grounded(O-) Theoretical(O+) No facets	Inquisitive v- 6 facets Learning Approach - 4 facets	O - Openness to Experience O1: Fantasy O2: Aesthetics O3: Feelings O4: Actions O5: Ideas O6: Values
Discipline Driven (C+) vs Inspiration Driven (C-) Reliable vs Spontaneous Structured vs Flexible Purposeful vs Adaptable	Organisation Adaptable(C-) Structured(C+) No facets	Prudence v- 7 facets	C – Conscientiousness C1: Competence C2: Order C3: Dutifulness C4: Achievement Striving C5: Self-Discipline C6: Deliberation
Extraversion (E+) vs Introversion (E-) Takes charge vs Observing Expressive vs Measured Sociable vs Intimate	Extraversion Introvert(E-) v Extravert(E+) No facets	Ambition - 6 facets Sociability - 5 facets	E – Extraversion E1: Warmth E2: Gregariousness E3: Assertiveness E4: Activity E5: Excitement Seeking E6: Positive Emotions
People Focused (A+) vs Outcome Focused (A-) Collaborative vs Competitive Empathetic vs Logical Accommodating vs Tough	Criticality Personable(A+) Logical(A-) No facets	Interpersonal vSensitivity - 5 facets	A - Agreeableness A1: Trust A2: Straightforwardness A3: Altruism A4: Compliance A5: Modesty A6: Tender-Mindedness
Risk Reactor (N+) vs Reward Reactor (N-) Vigilant vs Optimistic Responsive vs Resilient Modest vs Confident Impassioned vs Even Tempered	Emotional Involvement Calm(N-) v Volatile(N+) No facets	Adjustment - 8 facets	N – Neuroticism N1: Anxiety N2: Angry Hostility N3: Depression N4: Self-Consciousness N5: Impulsiveness