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 advances 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 5 factors. The 10 scale pairs have been further broken down into 32 facets. Factor Analysis of the 32 facets in an international sample of 2158 mixed working population replicates the Big Five Factor 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

1. 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 description of the 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 the Appendix 2.

1.3 Theoretical Objective

Separate the measurement of both poles of each Big Five personality construct, (rather than on 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.

2. Method

In a cross-sectional design N=2158 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 Component Analysis with Varimax rotation.

3. 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 that 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 and Reward Reactor aligns with the low end. 4 facets are then used to measure each of the on opposite ends. Following this approach, the second factor is labelled Introverted/ Extraverted and corresponds with the Extraversion factor and consists of 3 facets on each end. The third factor is Discipline Driven/ Inspiration Driven consisting of 3 facets each and is matched with the Conscientiousness factor. While the fourth factor is People Focused/ Outcome Focused also consisting of 3 facets on each pole and aligns with the Agreeableness Factor. Finally, the fifth factor is Big Picture Thinking/ Down To Earth that 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 **Risk Reactors & Reward Reactors**	Factor 2 Extraversion **Introversion & Extraversion**	Factor 1 Conscientiousness **Discipline Driven & Inspiration Driven**	Factor 4 Agreeableness **People Focused & Outcome Focused**	Factor 5 Openness **Big Picture Thinking & 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.
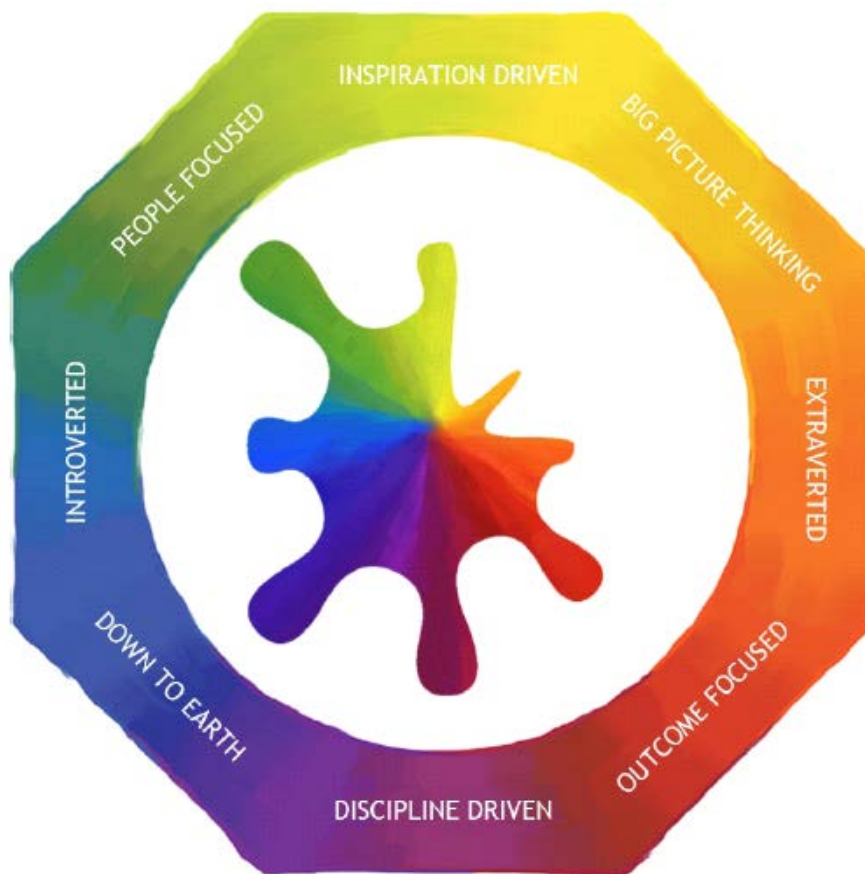

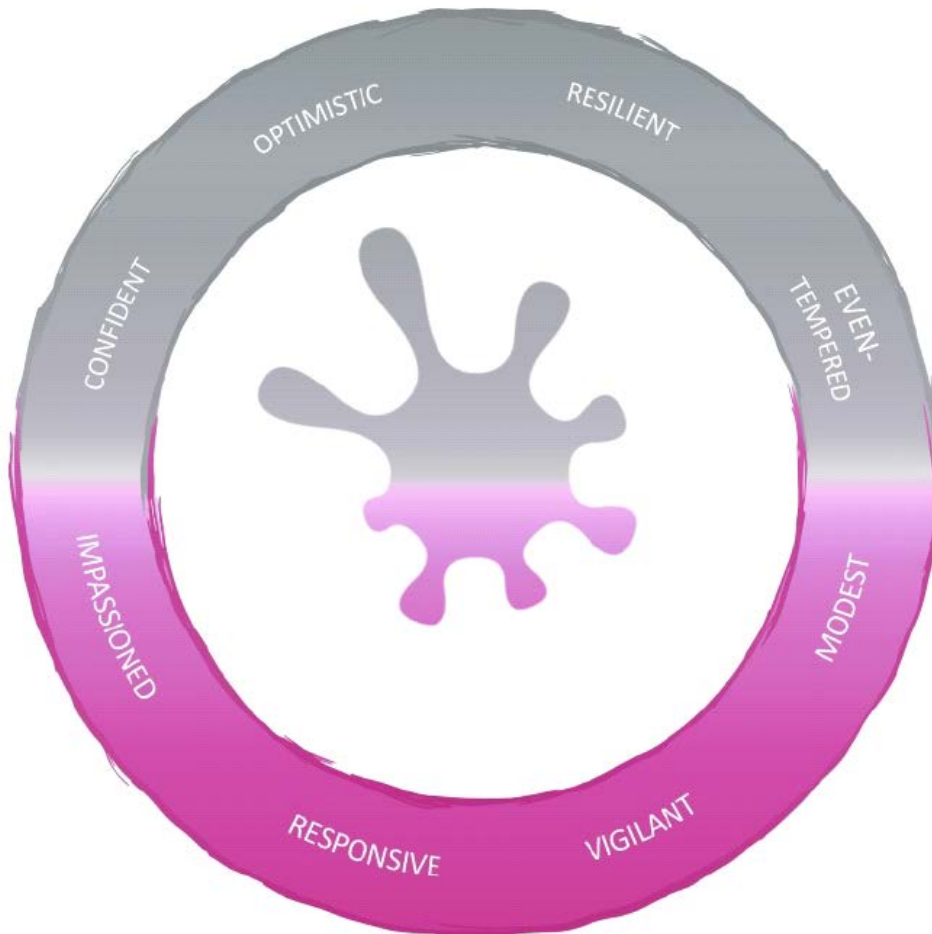Figure 1. Mandala showing four bi-polar factors

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
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-)
	v Theoretical(O+)
	No facets
		Inquisitive
		- 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-)
	v Structured(C+)
	No facets
		Prudence
		- 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+)
	v Logical(A-)
	No facets
		Interpersonal
		Sensitivity
		- 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