A PSYCHOMETRIC ANALYSIS OF THE THREE GUNAS

(Wolf, 1999)

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Terminologies :

- Gunas : Psychological Categorization system
- Qualitative research : Scale Development and validation
- Reliability
a) Internal reliability – using Chronbach alpha
b) Alpha If item deleted
- Validity
a) Face Validity
b) Content Validity
c) Construct Validity

Reliability

▶ The ability of an apparatus / system to consistently perform its intended or required function without degradation or failure.

▶ The term **reliability** in psychological research refers to the **consistency** of a research study or measuring test.

▶ For **example**, if a person weighs themselves during the course of a day they would expect to see a similar reading. **(Same results through time)**

▶ Psychologists consider three types of consistency:

❑ Over time (test-retest reliability),

❑ Across items (internal consistency), and

❑ Across different researchers (inter-rater reliability)

▶ **Cronbach's alpha** is the most common measure of internal consistency ("reliability")

Validity

▶ **Validity** in data collection **means** that your findings truly represent the phenomenon you are claiming to measure.

▶ **Scientific** test or piece of research actually measures what it sets out to.

▶ For **example** a test of intelligence should measure intelligence and not something else (such as memory)

Development of Scale

- According to the Vedas, all material elements are infused with the modes of nature, or gunas (sattva, rajas and tamas).

- Vaishnava Philosophy – Guna theory

- Attributes of each guna from – Bhagavad Gita (Prabhupada, 1972)

- 50 statements for each guna formulated

- 5 Vedic scholars (20 years experience): reduced items to 90

- Total items 90

- Sattva : 30

- Rajas: 28

- Tamas: 32

Content Validity

- A test has content validity if it measures knowledge of the **content domain** of which it was designed to measure knowledge

- Two Vedic authorities: To answer as dominated by each guna

- Secondary loadings : Rajas to Tamas

- Likert chosen : 7 point over 5 point (Factorial analysis)

Construct Validity

▶ **Construct validity** is "the degree to which a test measures what it claims, or purports, to be measuring.

▶ There are two **types of construct validity:**

1. Convergent
2. Discriminant validity.

Construct Validity

▶ Convergent construct validity- Pearson correlation

❑ With relation to 2 other scales

❑ Verbal Aggressiveness Scale – correlated with Rajas

❑ Satisfaction with Life Scale - correlated with Tamas

❑ Additional question : Hours of sleep per day – with Tamas

▶ Discriminant construct validity – with sex, siblings, age, height.

Results: Internal Reliability

- For 90 item VPI: (Alpha)
- Sattva – 0.85
- Rajas – 0.92
- Tamas – 0.90

- Items reduced from 90 – 80 - 56 (Based on content validity and Cronbach alpha)
- Alpha if Deleted

Data Collection:
Non probability convenience sampling

Nov '96	Jan '98	July- Dec '98
• N = 247	• N= 247 • Added Discriminant Validity- Height and no of siblings	• N= 125 • Magazine subscribers • No construct Validity scales

Items were further reduced from 80 to 56

Results: Descriptive Statistics

D. B. WOLF

TABLE 1

DESCRIPTIVE STATISTICS FOR FINAL VERSION OF THE VEDIC PERSONALITY INVENTORY,
THE SATISFACTION WITH LIFE SCALE, THE VERBAL AGGRESSIVENESS SCALE, HEIGHT,
NUMBER OF SIBLINGS, AND NUMBER OF HOURS OF SLEEP

Variable	M	SD	Minimum	Maximum	n
Vedic Personality Inventory					
Sattva	4.79	0.81	3.00	6.39	619
Rajas	3.91	1.02	2.46	5.96	619
Tamas	3.25	0.78	1.43	6.00	619
Satisfaction With Life Scale	21.85	5.78	8.00	35.00	489
Verbal Aggressiveness Scale	54.43	15.66	23.00	84.00	486
Hours of Sleep	7.11	1.12	5.00	10.00	494
Siblings	2.17	1.70	0.00	10.00	247
Height	2.69	1.24	1.00	4.00	247

Results: Convergent Validity

TABLE 2
MEASURES OF CONVERGENT CONSTRUCT VALIDITY

Guna	Verbal Aggressive-ness Scale		Satisfaction With Life Scale		Sleep		M r^2
	r	r^2	r	r^2	r	r^2	
Sattva	−.51	.26*	.65	.42*	−.36	.13	.34
Rajas	.71	.50*	−.37	.14	.00	.00	.50
Tamas	.35	.12	−.61	.37*	.38	.14*	.26

Note.—Mean r^2 was calculated using only those correlations that were expected to converge.
*Correlation was hypothesized to provide evidence of convergent validity.

Sex of participant, height, age, and number of siblings were predicted to have no correlation with any subscale. Table 3 shows that even the highest r^2 value for discriminant measures (.08) is lower than the lowest r^2 value (.14) for convergent measures.

Results: Discriminant Validity

TABLE 3
DISCRIMINANT CONSTRUCT VALIDITY

Guna	Sex*		Height		n Siblings		Age		$M\ r^2$
	r	r^2	r	r^2	r	r^2	r	r^2	
Sattva	.06	.00	.05	.00	.07	.00	.29	.08	.02
Rajas	.22	.05	−.21	.04	−.14	.02	−.18	.03	.04
Tamas	−.18	.03	.12	.01	−.07	.00	−.27	.07	.03

*Coded 1 for male and 2 for female.

Results: Factorial Analysis

- Multiple group Centroid method

- Loadings of 56 items – in 3 subscales

- Extent to which an item correlates with the subscale intended, as compared to other subscales.

- Sattva(15 items) – Correlation within items : 0.62- 0.87

- Sattva individual items to Rajas absolute values – 0.04 - 0.51 (3 items had correlation)

- Sattva individual items to Tamas absolute values – 0.43 – 0.67 (2 items had correlation)

Factorial Analysis (Nunnally et al, 94)
Not orthogonal

items of the inventory. Multiple-groups centroid factor analyses (Nunnally & Bernstein, 1994) support this conclusion, although factor analyses also imply that the constructs are not orthogonal. This is further evidenced by intersubscale correlations, which are shown in Table 4. These correlations support the results of the factor analyses and demonstrate that *sattva* and *tamas* have a very strong inverse relationship. Similar correlations between the *gunas* subscales were found in other research (Pathak, Bhatt, & Sharma, 1992).

TABLE 4

PEARSON INTERSUBSCALE CORRELATIONS

	Sattva	Rajas
Rajas	−.16	
Tamas	−.76	.31

Final VPI Scale

▶ Total 56 items

▶ Cronbach's Alpha Values:

Sattwa : 15 items (0.93)

Rajas : 19 items (0.94)

Tamas : 22 items (0.94)

Discussion

▶ Reliability : Test-retest

▶ Convergent Validity : Tamas with depression; Rajas with stress etc in future direction.

▶ Cross Cultural application

▶ Application in individual therapy

Critique

▶ Development : Content Bias – 2 Vedic scholars

▶ Discriminant Validity measures

▶ Reliability : Test-retest

▶ Convergent Validity : Tamas with depression; Rajas with stress etc

▶ Application of subscale in individual therapy

Comparative Scientific Studies : VPI Construct Validity

- The first hypothesis was that scores on the Vedic Personality Inventory **Goodness subscale** would have a relatively **high positive correlation** with those of the **Daily Spiritual Experiences Scale**

- The second was that a **relatively high negative correlation** was hypothesized for scores on the Vedic Personality Inventory **Goodness subscale** with those on the **Brief Symptom Inventory's Global Severity Index**

- The third was that moderately high **positive correlations** would occur between scores on the Vedic Personality Inventory **Passion and Ignorance subscales and the Brief Symptom Inventory's Global Severity Index and selected Brief Symptom Inventory subscales**.

Further scientific studies (2006)

FURTHER EXPLORATION OF THE VEDIC PERSONALITY INVENTORY: VALIDITY, RELIABILITY AND GENERALIZABILITY [1]

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Summary.—The purpose of this study was to explore the validity, reliability, and generalizability of the Vedic Personality Inventory which consists of constructs derived from the Vedic literature of India. There were 57 participants (20 men, 37 women). The mean age was 44.3 yr. ($SD = 15.1$). The sample was predominantly older, well-educated women who volunteered to participate as respondees to invitations to participate posted in supermarkets, churches, colleges, and on the internet. Analysis yielded statistically significant correlations for scores on the Vedic Personality Inventory and on the Daily Spiritual Experiences Scale and the Brief Symptom Inventory, each of which measures domains of interest addressed by the first inventory.

Construct Validity : Convergent and Discriminant

TABLE 4

INTERCORRELATIONS FOR SCORES ON VEDIC PERSONALITY INVENTORY WITH DAILY SPIRITUAL EXPERIENCES SCALE AND BRIEF SYMPTOM INVENTORY ($\geq$ .25)

Measure	Goodness	Passion	Ignorance
Daily Spiritual Experiences Scale	.41†	−.41†	−.46†
Brief Symptom Inventory Dimensions			
Somatization			
Obsessive/Compulsive			.25
Interpersonal Sensitivity	−.29*		.31*
Depression			.31*
Anxiety		.29*	.43†
Hostility		.25	
Phobic Anxiety	−.44†		.33*
Paranoid Ideation			
Psychoticism			.30*
Global Indices			
Global Severity Index	−.25	.33*	.51†
Positive Symptom Distress Index			.38†
Positive Symptom Total		.25	.44†

*p = .05 (2-tailed). †p = .01 (2-tailed).

VPI Scale

The Vedic Personality Inventory

1 = Very Strongly Disagree 2 = Strongly Disagree 3 = Somewhat Disagree 4 = Neutral

5 = Somewhat Agree 6 = Strongly Agree 7 = Very Strongly Agree

1. I am straightforward in my dealings with other people. 1 2 3 4 5 6 7

2. I have very little interest in spiritual understanding. 1 2 3 4 5 6 7

3. I am satisfied with my life. 1 2 3 4 5 6 7

4. Fruits and vegetables are among my favorite foods. 1 2 3 4 5 6 7

5. All living entities are essentially spiritual. 1 2 3 4 5 6 7

6. In conducting my activities, I do not consider traditional wisdom. 1 2 3 4 5 6 7

7. I often act without considering the future consequences of my actions. 1 2 3 4 5 6 7

8. I usually feel discontented with life. 1 2 3 4 5 6 7

9. I become happy when I think about the material assets that I possess. 1 2 3 4 5 6 7

THANK YOU