The Vedic Personality Inventory

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Abstract

The Vedic Personality Inventory was devised to assess the validity of the Vedic concept of the three gunas, or modes of nature, as a psychological categorization system. The sample of 619 subjects consisted of persons of varying ages and occupations from a mid-sized city in the Southeastern United States, and also of subscribers to a magazine focusing on Eastern-style spirituality. The original 90-item VPI was shortened to 56 items on the basis of reliability and validity analyses. Cronbach's alpha for the three subscales ranged from .93 to .94, and the corrected item-total correlation of every item on the VPI with its subscale was greater than .50. Three measures of convergent validity and four measures of discriminant validity provide evidence for the construct validity of the instrument. The loading of every item on the scale was stronger for the intended subscale than for any other subscale. Though each subscale contains congeneric items, the factors are not independent. This non-orthogonality is consistent with Vedic theory. This instrument needs to be tested cross-culturally, and to be experimentally implemented in group research and individual assessment.

A Psychometric Analysis of the Three Gunas

Vedic literature contains knowledge about all fields of human endeavor, from physics and psychology to medicine, art and aeronautics (Goswami, 1977). Empirical validation of the Vedas could therefore open storehouses of knowledge in many areas. According to the Vedas, all material elements are infused with the modes of nature, or *gunas- sattva*, *rajas* and *tamas*. Dasgupta (1961) describes the *gunas* as "the universal characteristics of all kinds of mental tendencies" (p. 468). Broad based confirmation of the Vedic psychological model would reasonably be grounded on a study of the *gunas*, as this idea underlies the Vedic conception of nature. From the perspective of the Vedas, our psycho-physical disposition consists of mixtures of the *gunas* (Prabhupada, 1976).

This article describes development of the Vedic Personality Inventory (VPI), an instrument that assesses the validity of the three *guna* constructs. Others, such as Uma, Lakshmi and Parameswaran (1971), Singh (1971), Rao and Harigopal (1979), Mohan and Sandhu (1986, 1988), Das (1991), and Pathak, Bhatt and Sharma (1992), have devised and utilized similar inventories, with *inter-guna* correlations that indicate differentiation of the three modes. Since the primary purpose of the present study is to examine the validity of Vedic constructs, it incorporates more extensive statistical analyses towards this end than other research on the *gunas*.

Also, the items of this inventory are derived from a Vaisnava, or personalist, understanding of Vedic philosophy. According to this view, the material personality manifested through the *gunas* is a covering of the original spiritual personality of the living entity. Bhagavad-gita [2:12 (Prabhupada, 1986)] asserts that the self is eternally an individual. Prabhupada explains "Arjuna and all the kings who are assembled on the battlefield are eternally individual beings ...It is not that they did not exist as individuals in the past, and it is not that they will not remain eternal persons. Their individuality existed in the past, and their individuality will continue in the future without interruption" (p. 89).

The personal emphasis of Vaisnava philosophy can provide a guiding ethic for social and mental health scientists. According to the Vedas, by removing the covering of the modes of nature the original spiritual personality of each individual will be manifest. Without such restoration of our spirituality, relationships are mechanically conducted on the basis of the *gunas*. According to Vaisnava philosophy, fully spiritual relationships can be achieved only when the *gunas* are absent, and replaced with the quality of pure goodness, or *suddha sattva*, which is the platform of spiritual existence (Prabhupada, 1976). Consequently, investigating and instituting methods for extricating the self from the *gunas* is relevant for the social and mental health sciences.

To test the validity of the Vedic constructs of the three *gunas*, it is best to devise an instrument that covers the domain of personality described in the Vedas themselves. Apart from studying the *gunas* as a universal typology, there has been increased skepticism regarding the applicability of Western psychological constructs for explicating and understanding the psychology of indigenous peoples (Gergen, Gulerce, Lock, & Misra, 1996). Therefore, a cultural perspective also dictates examination of the *gunas* as the Vedas describe them, rather than trying to understand Vedic concepts by reducing them to constructs originating in Western thought. Gergen, Gulerce, Lock and Misra have suggested exploration of Vedic psychology with emphasis on the spiritual ontology of personhood. This is an important perspective, as the Vedas describe the self as a spiritual entity that is personal and irreducible [Bhagavad-gita 2:12 and 2:24 (Prabhupada, 1986)]. Any theory based on a reductionistic ontology of personhood would be incompatible with the Vedic paradigm and persons culturally attuned to that paradigm. The VPI is an attempt to apply the concepts of Vedic personality while preserving the integrity of *guna* theory.

Vedic theory asserts that while the classification scheme of the three *gunas* comprises all aspects aspects of material, social and psychological reality, the *gunas* themselves are related to each other. Specifically, *rajas guna* is described as an intermediary between *tamas guna* and *sattva guna* (Prabhupada, 1976). Therefore, it is expected that there will be an inverse relationship between *sattva guna* and *tamas guna*. In terms of psychometric theory, this type of

relationship between constructs meets the definition of a weak psychometric theory, wherein the factors are non-orthogonal (Nunnally & Bernstein, 1994).

Method

Defining Constructs

Descriptions of each *guna* were compiled from the *Bhagavad-gita As It Is* (Prabhupada, 1986), Chapters 14, 17 and 18, as well as Dasgupta (1961). *Sattva guna* is characterized by qualities such as cleanliness, truthfulness, gravity, dutifulness, detachment, discipline, mental equilibrium, respect for superiors, contentment, sharp intelligence, sense control, and staunch determination. Dasgupta describes the *sattvic* quality as being "free from attachment and vanity and absolutely unruffled in success and failure" (p. 470). Krsna explains in the Bhagavad-gita [17:15, p. 783] that the speech of a person predominantly in *sattva guna* is "truthful, pleasing, beneficial, and not agitating to others" and that a sattvic person is characterized by Òsatisfaction, simplicity, gravity, self-control and purification? [17:16, p. 784].

Attributes of *rajas guna* include intense activity, desire for sense gratification, little interest in spiritual elevation, dissatisfaction with one's position, envy of others, and a materialistic mentality. Bhagavad-gita [18:24, p. 815] describes *rajasic* activity as "action performed with great effort by one seeking to gratify his desires, and enacted from a sense of false ego," and a person predominated by *rajas guna* is described as "greedy, always envious, impure, and moved by joy and sorrow" [18:27, p. 817].

Qualities associated with *tamas guna* include mental imbalance, anger, ignorance, arrogance, depression, laziness, procrastination, and a feeling of helplessness. Dasgupta (1961) explains that "the quality of *tamas* overcomes the illumination of knowledge and leads to many errors. *Tamas*, being a product of ignorance, blinds all living beings and binds them down with carelessness, idleness and sleep" (p. 462).

Scale Design and Item Development

From the descriptions of the *Bhagavad-gita* (Prabhupada, 1986) and Dasgupta (1961), fifty statements were formulated for each *guna*. These took the form of sentences with which

someone who is predominated by that mode would strongly agree. Utilizing feedback from a team of five Vedic scholars, each of whom had more than twenty years experience studying and teaching the Vedas, the item sample was reduced to ninety items that were considered most representative of the *gunas*, and that would best differentiate between the *guna* constructs. According to the Vedic experts, these ninety items, comprised of 30 for *sattva guna*, 28 for *rajas guna*, and 32 for *tamas guna*, adequately covered the domain of attributes for each mode. To further determine content validity, two Vedic authorities, who had not previously been exposed to any of the items, each completed three copies of the 90-item questionnaire. On each copy, they answered as if they were primarily influenced by one of the *gunas*. Then their responses were compared to the expected responses for each item. For example, a *sattva* item would be expected to receive a response of "very strongly agree" when the Vedic experts answered as if they were predominated by *sattva*, and a response of disagreement or less agreement if they were predominated by *rajas* or *tamas*. Based on this analysis, the wording of some items was changed to accentuate the differences between the modes. Also, this procedure indicated that several items, while primarily representative of one mode, would be expected to load heavily on another mode. Specifically, many *rajas* items were predicted to have strong secondary loadings on *tamas*.

A seven-point scale was chosen as a balance between convenience, for the participant and researcher, and statistical power. Given the relatively large number of items in the instrument, nine or eleven response choices would not significantly strengthen statistical determinations. Still, to minimize chances of spurious outcomes, especially in factor analyses, a seven-point scale was chosen over a five-point scale.

For convergent construct validity, two existing scales, the Verbal Aggressiveness Scale (VAS) (Infante & Wigley, 1986) and the Satisfaction With Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985), were included at the end of the VPI. Existing personality inventories based on the *gunas* were not used for convergent validity because there are no reliability studies for these instruments. Also, it would have been impractical to administer two

lengthy surveys with similar questions. The scores on the VAS were hypothesized, based on Vedic theory, to correlate positively with *rajas* and negatively with *sattva*, and the scores on the SWLS were expected to correlate positively with scores on the *sattva* scale and negatively with the *tamas* scale. Also, a single-item indicator, hours of sleep per day, was included at the end of the survey. This indicator was hypothesized to correlate positively with *tamas*, as excessive sleep is a characteristic of one in *tamas*. Additionally, six demographic questions, pertaining to gender, age, years of education, ethnicity, religion practiced and religion of parents, were asked. Gender was included as a measure of discriminant validity, as it was not expected to correlate with any of the modes, and the other demographic questions were included for possible use in future analysis of the instrument.

Based on assessment of Cronbach's alpha reliability, content validity, and confirmatory, multiple groups centroid factorial analysis (Nunnally & Bernstein, 1994), each item was evaluated and the 90-item scale was reduced to an 80-item scale, consisting of 28 *sattva* items, 24 *rajas* items, and 28 *tamas* items. In the version of the 80-item VPI that was distributed to subjects, two additional questions, regarding height and number of siblings, were added to more thoroughly evaluate discriminant construct validity.

Data Collection

The author and two research assistants administered the questionnaire to voluntary participants in a mid-sized Southern city in the United States in November of 1996. Anonymity of subjects was maintained, as surveys were returned to a box, without the participants' identity being revealed to the researcher. This was a nonprobability convenience sample of 247 persons, consisting of 52.5% males and 47.5% females. Eighty-four percent of the sample was Euro-American, with the remaining 16% being African-American and Asian-American. University students comprised 41% of the sample, while nurses and doctors constituted 14%. Other occupations represented in the sample included clerical work, physical labor, and social services. More than 93% of the participants were raised in Christian homes, and more than 67% currently

practice some form of Christianity. The mean years of education for participants was 14.9, and their ages ranged from 18 to 64 years, with a mean of 32.5.

A combination of Cronbach's alpha analyses, multiple groups factor analyses (Nunnally & Bernstein, 1994) and evaluation of content validity applied to the data from the above sample resulted in an 80-item scale, consisting of 28 *sattva* items, 24 *rajas* items, and 28 *tamas* items. During January, 1998, this 80-item scale was administered to 247 persons. For the combined 494 person sample, there were 257 (52%) (females) and 237 (48%) males. Seventy-two percent of the 494 persons was Euro-American, 20% was African-American, and 8% was Asian-American. Of the 494 subjects, 287 (58%) were university students and 124 (25%) were medical professionals. The average number of years of education for participants was 15.3, and their ages ranged from 18 to 64 years, with a mean of 31.9. For the January, 1998 sample, two items, height and number of siblings, were added to the survey for assessing discriminant construct validity.

From July through December, 1998, the 80-item VPI was completed by 125 subscribers to a magazine dealing with Eastern-style spirituality. This version of the VPI did not include any demographic items or scales for construct validity.

Results and Data Analysis

Descriptive Statistics

After statistical analysis of all 619 surveys, a final 56-item scale was created[1]. Table 1 provides descriptive statistics for the revised, 56-item version of the VPI.

For supplemental tables, S = Sattva, R = Rajas, and T = Tamas. The numbers of items correspond with the item numbers as they appear on the 90-item VPI. The items of the 56-item VPI are shown after Supplemental Table 6.

Supplemental Table 1

Corrected Item-total Correlation and Alpha if Item Deleted for Sattva

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Alpha if Item Deleted
S6	60.5919	304.4931	.5021	.9267
S7	60.7212	283.1043	.7569	.9192
S8	60.4687	286.8285	.6762	.9220
S17	60.3010	288.3890	.7458	.9196
S19	59.8182	306.4244	.5827	.9245
S21	60.0667	294.1312	.6347	.9231
S27	60.2182	299.3855	.6790	.9220
S36	60.0162	302.2588	.6520	.9228
S39	60.6788	279.7650	.8299	.9167
S43	60.8242	290.1614	.6861	.9215
S56	60.3030	297.7865	.5543	.9256
S61	60.2768	301.1803	.5981	.9240
S62	59.7273	304.1299	.5996	.9240
S72	60.5293	289.9015	.7334	.9201
S90	60.5657	299.6268	.5645	.9251

N of Items = 15   Alpha =   .9273

Every item of this 15 item subscale has a corrected item total correlation above .5, and each item increases alpha.

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Scores for the *gunas* were obtained by adding the responses for the items for each scale corresponding to a *guna* and then dividing by the number of items. For each subscale, a higher score indicates greater predominance of that mode. Scores on the SWLS and VAS are the sums of responses on the respective instruments, with the VAS having ten out of twenty items with reverse scores. Sleep was measured in hours per day. Cronbach's alpha for this sample for the VAS was .90, and for the SWLS alpha was .82. Designers of the VAS (Infante & Wigley, 1986) report an alpha of .81, and the creators of the SWLS (Diener, Emmons, Larsen, & Griffin, 1985) report an alpha of .87. As per recommendations by the authors of the scales, VAS cases were retained for the present analysis if at least fifteen of twenty questions were answered, and SWLS cases were retained if at least four of five questions were answered. Height was measured as an ordinal scale, with "1" representing "Under 5 feet", "2" indicating "Between 5 feet and 5.5 feet", "3" indicating "Between 5.5 and 6 feet", and "4" representing "Over 6 feet".

Reliability

Each *guna* constitutes a subscale, and internal reliability for each subscale was measured using Cronbach's alpha. For the 90-item VPI, alpha for the *sattva scale* was .85, for *rajas* it was .92, and for *tamas* it was .90.

Using SPSS statistical software for Macintosh, Alpha if Item Deleted was computed for each item in each subscale. Alpha if Item Deleted values indicate Cronbach's alpha for the subscale if the item was not included in the subscale. If Alpha if Item Deleted is lower than alpha for the subscale, this means that the item increases alpha, and thus adds to the reliability of the subscale. If Alpha if Item Deleted is higher than alpha for the subscale, this indicates that the item weakens the reliability of the subscale (Nunnally & Bernstein, 1994).

For the *sattva* subscale, two items had an Alpha if Item Deleted that was higher than alpha for the sattva subscale, and these two items were deleted from the subscale. Alpha for the 28-item *sattva* subscale was then calculated as .87.

In the *rajas* subscale, four items had an Alpha if Item Deleted that was higher than alpha for the subscale, and these four items were removed from the scale. Alpha for the 24-item *rajas* subscale was then calculated as .93.

For the *tamas* subscale, four items had an Alpha if Item Deleted that was higher than alpha for the subscale, and these four items were removed from the scale. Alpha for the 28-item *tamas* subscale was then calculated as .91.

As described above in the data collection section, the 80-item VPI was administered to 372 subjects. Reliability analyses were performed for the entire sample of 619 persons. In this analysis Alpha if Item Deleted was calculated for each item, as was Corrected Item-Total Correlation. Hudson and Faul (1997) explain that Corrected Item-Total correlations are an assessment of convergent construct validity at the item level of analysis, and they recommend a criteria of .50 as a cutoff point for retention of items. This criteria was applied to the statistical analysis of the 80-item VPI, as was the criteria that each item had to have an Alpha if Item Deleted lower than the alpha for the subscale.

Using the criteria described above, the *sattva* subscale retained 15 items and had an alpha of .93. The *rajas* subscale retained 19 items and had an alpha of .94, and the *tamas* subscale retained 22 items and had an alpha of .94. This resulted in a final VPI with 56 items, with each item having a Corrected Item-Total Correlation greater than .50, and each item adding to the reliability of its subscale, as measured by Cronbach's alpha[2].

Construct Validity

Correlations of the subscales with the VAS and SWLS, as well as with hours of sleep per day, were calculated as measures of convergent validity. All correlations in this analysis are Pearson product-moment (r) correlations.

Vedic theory predicts that verbal aggressiveness is positively correlated with *rajas* and negatively correlated with *sattva*, and that life satisfaction correlates positively with *sattva* and negatively with *tamas* (Dasgupta, 1961). Hours of sleep was predicted to be positively correlated with *tamas*. Values of r^2 reported in Table 2 show good preliminary evidence for convergent validity of the VPI. Mean r^2 values are calculated using only those correlations that were expected to give evidence for convergent validity. Convergent validity measures do not include the subjects who were subscribers to the magazine dealing with spirituality, because the VPI surveys they completed had no convergent validity items. For each measure of convergent validity, items expected to correlate had a higher r^2 than items not expected to correlate. All correlations were in the expected direction.

Supplemental Table 2

Corrected Item-total Correlation and Alpha if Item Deleted for Rajas

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Alpha if Item Deleted
R11	69.7939	455.3623	.7333	.9307
R12	69.7111	442.3880	.7336	.9306
R26	69.3212	464.0403	.6613	.9321
R28	70.0485	465.2365	.6128	.9331
R31	69.4141	467.5872	.6126	.9331
R32	70.1010	474.3946	.5242	.9347
R34	69.8970	465.8780	.6062	.9332
R35	70.0687	466.4001	.5917	.9335
R41	70.4323	468.6103	.6413	.9326
R42	70.0061	456.3218	.6933	.9314
R47	70.1495	455.3906	.6813	.9317
R48	69.6747	460.2806	.6240	.9329
R63	70.2626	468.8499	.5453	.9344
R74	69.2566	479.2923	.5007	.9350
R76	69.4263	447.3949	.7561	.9300
R79	69.9899	471.2732	.5803	.9336
R80	69.8202	463.1842	.6735	.9319
R81	70.2424	466.0707	.6484	.9324
R82	69.7293	465.6108	.6779	.9319

 N of Items = 19   Alpha =   .9359

In this 19 item subscale, each item improves alpha, and corrected item total correlations are all above .5.

Gender 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.

Supplemental Table 3

Corrected Item-total Correlation and Alpha if Item Deleted for Tamas

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Alpha if Item Deleted
T2	75.4699	569.0079	.6625	.9342
T5	75.0520	562.8119	.6010	.9353
T9	75.1892	568.5245	.6772	.9340
T10	75.1435	565.9148	.6441	.9344
T18	75.2578	564.5501	.6300	.9346
T23	75.4491	562.8979	.6685	.9340
T24	75.3555	571.3213	.5713	.9356
T29	75.8108	573.9204	.6706	.9342
T44	75.1767	564.4791	.5283	.9370
T50	74.7817	583.8418	.5068	.9365
T54	75.2183	574.3960	.6499	.9345
T58	75.3514	574.0200	.6093	.9350
T59	74.5967	568.8828	.6472	.9344
T70	74.9064	569.8600	.6132	.9349
T71	75.3576	556.7969	.7248	.9330
T73	75.9168	587.3389	.5014	.9365
T75	75.2058	578.8555	.5235	.9363
T77	75.4324	560.8668	.6529	.9343
T86	75.4511	573.2898	.6133	.9349
T87	75.3971	560.2399	.6266	.9348
T88	75.7360	579.9197	.6146	.9351
T89	76.0416	563.5483	.7056	.9334

N of Items = 22   Alpha =   .9376

Every item of this 22-item subscale increases alpha, and has a corrected item total correlation above .5.

Overall there is encouraging evidence for construct validity. For *sattva*, the mean r^2 for convergent validity was .34, while r^2 for discriminant validity was .02. For *rajas*, r^2 for convergent validity was .50, and for discriminant validity it was .04. For *tamas*, mean r^2 was .26 for convergent validity and .03 for discriminant validity measures. Nunnally and Bernstein (1994) explain that r^2 is a measure of the proportion of variance explained. The low average r^2 values, ranging from .02 to .04, indicate that the discriminant measures account for only a trivial percentage of the variance, as predicted by Vedic theory. Rosenthal (1997) states that r values

about .50 indicate strong association, and r values about .7 indicate very strong association. This means that the convergent indicators for *sattva* have a strong to very strong association with *sattva* (average r = .58), the indicators for *rajas* have a very strong association with *rajas* (average r = .71), and the indicators for *tamas* have a strong association with *tamas* (average r = .51).

Factorial Validity

Factorial validity for the VPI was assessed using the confirmatory, multiple groups centroid method. Loadings for each item of the 56-item VPI were computed for each of the three subscales. Factorial validity indicates the extent to which an item correlates with the subscale with which it is intended, as compared to other subscales (Nunnally & Bernstein, 1994).

For the 15 items in the *sattva* subscale, correlations between the items and the *sattva* subscale ranged from +.62 to +.87. Absolute values of the correlations of the *rajas* subscale with individual items in the *sattva* subscale ranged from .04 to .51, with only 3 of 15 items having a correlation with an absolute value greater than .23. Absolute values of the correlations of the *tamas* subscale with individual items in the *sattva* subscale ranged from .43 to .67. All 15 of these correlations had negative values, and two of them had absolute values greater than .62 (the lowest value for *sattva* subscale correlations with *sattva* items). For these two items, however, the correlation with the *sattva* subscale was stronger than the correlation with the *tamas* subscale.

For the 19 items in the *rajas* subscale, correlations between the items and the *rajas* subscale ranged from +.57 to +.80. Absolute values for the correlations of the *sattva* subscale with individual items in the *rajas* subscale ranged from .02 to .47, with only 3 of 19 correlations having a correlation with an absolute value greater than .30. Absolute values of the correlations of the *tamas* subscale with individual items in the *rajas* subscale ranged from .01 to .52. Only 1 of these 19 correlations (-.01) had a negative value, and 18 had positive values.

For the 22 items in the *tamas* subscale, correlations between the individual items and the *tamas* subscale ranged from +.55 to +.76. Absolute values for the correlations of the *rajas* subscale with individual items in the *tamas* subscale ranged from .01 to .53. Two of these

correlations had negative values (-.01 and -.06), and 20 had positive values. Absolute values of the correlations of the *sattva* subscale with individual items in the *tamas* subscale ranged from .35 to .74, with all 22 items possessing negative values. Although some items in the *tamas* subscale had correlations with the *sattva* subscale with an absolute value greater than .55, every item in the *tamas* subscale had a correlation with the *tamas* subscale that was higher than its correlation with the *sattva* subscale.

These factor analyses[3] demonstrate that every item in the VPI has a strong correlation with its intended subscale, and the strongest correlation for every item is with its intended subscale. However, some items in the *sattva* and *tamas* subscales have strong negative correlations, defined as correlations that are stronger than the weakest item's correlation with the intended subscale, with an unintended subscale. These results suggest that Vedic *guna* theory can be considered a "weak" theory for psychometric purposes. Nunnally and Bernstein (1994) explain that a "weak" theory is suitably tested with a confirmatory, multiple groups centroid method, as used in this investigation. A "weak" theory is concerned with whether or not proposed groupings of variables exist. However, such a theory does not assume that the factor structure underlying these groupings are the only possible explanatory classification. When assessing a "weak" theory, independence of factors is not assumed.

With regards to this investigation of the three *gunas*, analyses of reliability and construct validity suggest that the three *gunas* are a viable categorization scheme. That is, the analyses indicate that the elements comprising each of the *gunas* as described in the Vedas are congeneric, with a single factor underlying each of the three combinations of attributes, as delineated by the items of the VPI. Multiple groups centroid factor analysis (Nunnally & Bernstein, 1994) support this conclusion, though factor analyses also imply that the constructs are not orthogonal. This is further evidenced by inter-subscale 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 on the *gunas* (Pathak, Bhatt, & Sharma, 1992).

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Supplemental Table 4

Factor Analysis for Sattva Items

	Sattva	Rajas	Tamas
S6	.56828	-.51761	-.38864
S7	.81294	-.23043	-.51700
S8	.76078	-.13303	-.63942
S17	.78685	.12246	-.57194
S19	.62974	-.03560	-.49317
S21	.70417	.13330	-.49179
S27	.71828	-.23304	-.55815
S36	.69271	-.11731	-.54389
S39	.86541	-.23256	-.66501
S43	.73706	-.10678	-.43466
S56	.62271	-.17791	-.60059
S61	.65606	-.17717	-.48986
S62	.64614	-.15637	-.55552
S72	.77592	-.43873	-.58321
S90	.63042	-.38900	-.54453

Discussion

Nunnally and Bernstein (1994) state that Cronbach's alpha should be at least .80 for an instrument to produce interpretable research outcomes. Alpha measures for the three subscales are .93, .94 and .94. Therefore the 56-item VPI is adequate for group research, and perhaps also for individual assessment, with regards to reliability. Each item of the VPI contributes positively to the reliability of its subscale, and each item also has a corrected item-total correlation with its subscale greater than .50. These statistics suggest strong subscales, meaning that the elements of the subscales correlate strongly with each other.

Establishing face validity involves judgment of item adequacy after an instrument has been constructed, and establishment of content validity involves the rational process of defining the domain of a construct and selecting items that accurately and comprehensively cover that domain (Nunnally & Bernstein, 1994). Face and content validity for the VPI have been confirmed by a panel of Vedic experts. This panel checked contents of the inventory at each stage of the item

screening process, and they have affirmed that the items of each subscale of the 56-item VPI adequately cover the domain of each mode. The three items assessed for convergent validity-verbal aggressiveness, life satisfaction, and hours of sleep- all provide evidence for construct validity of the instrument. Further, the four items evaluated for discriminant validity- gender, age, height, and number of siblings- also support construct validity of the VPI. Bloom, Fischer, and Orme (1995) explain that construct validity is a measure of the extent to which empirically observed relationships between measures of concepts agree with theoretically predicted interrelationships between concepts. The results of convergent and discriminant validity measures in this study provide evidence for the construct validity of the VPI. Multiple groups factor analyses (Nunnally & Bernstein, 1994) support the categorization scheme of the three *gunas*, and they also support the assertion of Vedic theory that *sattva* and *tamas* are inversely correlated, with *rajas* as an intermediary mode.

Overall, the hypotheses of the Vedas concerning the *gunas* are supported by this research. Items of each subscale array themselves as a unit, and *guna* theory is further supported by measures of constructs such as life satisfaction, verbal aggressiveness and gender.

Test-retest reliability of the VPI should be conducted. Such testing will indicate the potential usefulness of the instrument for both group experimental work and assessment of individuals. Also, to facilitate practical utilization, alternate forms of the scale can be developed to remove testing effects among subjects. For further testing of the validity of the instrument, the VPI can be correlated with additional measures of convergent validity. For instance, the *rajas* subscale, which in this investigation was evaluated for only one measure of convergent validity, can be correlated with a standardized measure of stress, and *tamas* can be correlated with a standardized measure of depression. Future statistical analysis of the VPI should evaluate floor and ceiling effects of the items and subscales. In addition, the instrument should be tested on a wide variety of populations, in order to establish norms for the subscales and also to determine the transcultural value of the VPI.

Currently the VPI is being used in a group experiment on the effects of chanting the *maha mantra*, which is a mantra predicted in the Vedas (Prabhupada, 1976) to increase *sattva* and decrease *rajas* and *tamas*. There are many potential applications of the instrument, in group experimentation as well as individual analysis. In the Vedic tradition *guna* theory is the basis for vocational guidance (Dasgupta, 1961), and the VPI could be applied, experimentally at first, for that purpose. To do this, the evaluators would need to become acquainted with *guna* theory as it applies to career orientation. In individual assessment, the VPI can be used as a measure of change. For instance, an intervention for a client with a depressive disorder would be expected to result in an increase in the *sattva* subscale score and a decrease in the *tamas* subscale score, and a client with a stress-related disorder would be expected to decrease the *rajas* subscale score and increase the *sattva* subscale score if therapy is successful.

For supplemental tables, S = Sattva, R = Rajas, and T = Tamas. The numbers of items correspond with the item numbers as they appear on the 90-item VPI. The items of the 56-item VPI are shown after Supplemental Table 6.

Supplemental Table 5

Factor Analysis for Rajas Items

	Sattva	Rajas	Tamas
R11	-.30493	.76798	.52275
R12	-.20573	.78021	.23091
R26	-.45268	.70768	.41288
R28	-.22965	.66260	.52151
R31	.02663	.66746	.04599
R32	-.12231	.57776	.25422
R34	-.15472	.65515	.20996
R35	-.47496	.64128	.52009
R41	-.14263	.68351	.20252
R42	.10673	.74317	-.01360
R47	.02945	.72458	.14282
R48	-.08410	.68055	.31233
R63	-.25621	.60696	.30802
R74	-.17690	.56494	.33608
R76	-.31772	.79467	.35141
R79	-.05706	.62782	.13782
R80	-.21839	.72387	.27930
R81	.01579	.69955	.07459
R82	-.28401	.72153	.45691

Supplemental Table 6

Factor Analysis for Tamas Items

	Sattva	Rajas	Tamas
T2	-.41449	.42881	.70182
T5	-.37949	.51151	.65035
T9	-.51243	.52801	.71154
T10	-.42875	.43776	.68547
T18	-.35572	.52917	.67472
T23	-.48426	-.01014	.70794
T24	-.53604	.02114	.61894
T29	-.44343	.10035	.70558
T44	-.48795	.47732	.58856
T50	-.52113	.21229	.55174
T54	-.49504	.25909	.68471
T58	-.35245	.49174	.65038
T59	-.54686	.51709	.68955
T70	-.54493	.39697	.65910
T71	-.59420	.02179	.75940
T73	-.36214	.09161	.54268
T75	-.56443	-.06459	.57329
T77	-.58071	.14869	.69590
T86	-.58050	.17818	.65257
T87	-.59975	.03383	.67637
T88	-.52834	.29482	.64961
T89	-.74231	.23511	.73911

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