

**Fortitude as stress-resistance: Development and validation of the Fortitude
Questionnaire (FORQ)**

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This article reports on the development and validation of the Fortitude Questionnaire. The FORQ is a 20-item questionnaire that measures the theoretical construct of fortitude. Fortitude is defined as the strength to manage stress and stay well and this strength derives from an appraisal of the self, the family and support from others. Respondents consisted of 484 undergraduate psychology students at the University of the Western Cape. The results indicated that the FORQ is a highly reliable and valid measure of the construct of fortitude. Both exploratory as well as confirmatory factor analyses supported the hypothesized three-factor structure of fortitude. Fortitude was related to measures of well-being and distress, as well as to those instruments used as item pool for the selection of items. The sound psychometric properties of the FORQ support the use of the measure in more systematic research programs on coping.

A preventive psychology demands that our efforts be focused on the development of a theory of coping. Several constructs have been proposed in the overseas literature as central to a theory of coping. These constructs are said to enable people to manage stress and stay healthy and include hardiness (Kobasa, 1979), sense of coherence (Antonovsky, 1979), and potency (Ben-Sira, 1985).

Hardiness is defined as a personality construct that consists of the following dimensions: (a) a sense of control over experienced events, (b) a feeling of commitment to various life areas, and (c) a view of life change as a challenge (Kobasa, 1982).

Writing from what he calls a salutogenic perspective (salus=health,

¹ A copy of the FORQ is available from the author: Private Bag X60, Roodepoort, 1725.

genesis=origin), Antonovsky (1979, 1984) proposes that the central construct in understanding how people cope is sense of coherence. Sense of coherence is regarded as a construct that is perceptual in nature with both cognitive and affective components. It is a way of seeing the world and one's life in it. In this regard it is seen as a dispositional orientation rather than a state or trait. The dimensions of a sense of coherence are: (a) comprehensibility which refers to the sense that life is ordered, consistent and makes sense, (b) manageability which refers to the extent to which one perceives that resources are at one's disposal which can be used to meet the demands of the stimuli one is confronted with, and (c) meaningfulness which refers to the extent that one feels that life makes sense emotionally rather than cognitively.

Potency has been defined as *"a person's enduring confidence in his own capacities as well as confidence in and commitment to his/her social environment, which is perceived as being characterised by a basically meaningful and predictable order and by a reliable and just distribution of rewards"* (Ben-Sira, 1985, p. 399). Potency is said to be the outcome of past experiences of coping and therefore comprises mastery and self-appreciation.

In a South African study (Pretorius & Heyns, Under Editorial Review) the construct of fortitude has been proposed as an answer to the question "what enables people to manage stress and stay healthy?". Fortitude has formally been defined as the strength to manage stress and stay well and this strength derives from an appraisal of the self, the family and support from others. It has been suggested, therefore, that the dimensions of fortitude are:

- an evaluative awareness of the self: This includes both the global appraisal of the self, as well as more specific appraisals such as problem-solving

efficacy and mastery or competence.

-an evaluative awareness of the family environment, for example support from family, level of conflict and cohesiveness in the family and family values.

-an evaluative awareness of the support from others. This would include both quantitative (i.e. perceived levels of support), as well as qualitative (i.e. satisfaction) dimensions of support. In addition it would include beliefs about the efficacy of using such support resources.

Fortitude in essence, therefore is the strength derived from appraising ourselves and our world positively, enabling us to cope with life stress.

The current study reports on the development and psychometric validation of an instrument designed to measure fortitude.

Method

Participants

The participants were 484 undergraduate psychology students at the University of the Western Cape, South Africa. The students completed the questionnaires during a lecture period and participation was entirely voluntary. A summary of the characteristics of the sample in terms of a number of key demographic characteristics is presented in Table 1. The sample appears to be predominantly female (72.5%), African-speaking (62.5%), enrolled on a full-time basis (78.5), single (81.7), from an urban background (56.1) and with a mean age of 26.18 years.

Table 1

Description of sample characteristics

	N	%
Gender		
Male	133	27.5
Female	350	72.5
Language		
English	94	19.6
Afrikaans	70	14.5
African	300	62.5
Status		
Fulltime	380	78.5
Parttime	98	20.5
Marital status		
Married	88	18.3
Single	392	81.7
Background		
Rural	137	43.9
Urban	175	56.1
Mean age	26.18	

Measuring instruments

Apart from an instrument designed to measure fortitude and which will be reported on in detail in the results section, the following instruments were used in the current study:

- (1) psychological well-being: Satisfaction with Life Scale (SWLS), the Positive and Negative Affect Schedule (PANAS), and the Short Happiness and Affect Research Protocol (SHARP).

The Satisfaction with Life Scale (SWLS: Diener, Emmons, Larsen, & Griffin, 1985), was developed to assess satisfaction with the respondent's life as a whole rather than satisfaction with specific domains such as health or finances. It consists of 5 items presented on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). High scores on the scale reflect greater satisfaction with life in general. The SWLS has also very strong reported internal consistency and temporal stability. The original study (Diener et al., 1985) reported a coefficient alpha of 0.87 and a 2-month test-retest reliability of 0.82. Subsequent studies (eg. Blais, Vallerand, Pelletier, & Briere, 1989; Magnus, Diener, Fujita, & Pavot, 1992; Pavot, Diener, Colvin, & Sandvik, 1991; Yardley, & Rice, 1991) found alpha coefficients ranging between 0.79 and 0.89 as well as test-retest reliabilities ranging between 0.54 and 0.84. Validity data on the SWLS include the sensitivity of the scale to life conditions that could affect life satisfaction as well as its relationship to a host of self-report and external criteria.

The Positive and Negative Affectivity Schedule (PANAS: Watson, Clark, & Tellegen, 1988) consists of two 10-item scales designed to measure the two dominant dimensions of affect, namely positive and negative affect. Positive affect (PA) reflects the extent to which a person feels enthusiastic, active and alert, while negative affectivity (NA) subsumes a variety of aversive mood states, including anger, contempt, disgust etc. The scale consists of 20 mood descriptors (like excited, afraid) and respondents are then expected to indicate the extent to which they generally feel that way on a 5-point scale (1=very slightly; 5=extremely). With regards to reliability, Watson et al. (1988) reports satisfactory and acceptably high alpha coefficients ranging from 0.86 to 0.90 for PA and from 0.84 to 0.87 for NA. The factorial validity of the scale has also been confirmed, while correlations with

measures of distress and psychopathology serve as additional indices of validity.

The Short Happiness and Affect Research Protocol (SHARP: Stones, Kozma, Hirdes, Gold, Arbuckle, & Kolopack, 1995) is a relatively new instrument that is offered by the authors as a brief measure for measuring subjective well-being. In this regard it is seen as an instrument that combines affect and disposition in measuring subjective well-being. It consists of 12 items measured in terms of a yes/no format, with higher scores indicating higher levels of subjective well-being. Reliability data for various types of samples have been reported (Stones et al. 1995), including residents in long-term care, undergraduate students as well as English and French linguistic groups. These data show internal consistency coefficients of above 0.74 and test-retest reliability coefficients of above 0.41. Validity of the SHARP is based, amongst others, on correlations with self-ratings and observer ratings, as well as with positive and negative affectivity.

(2) psychological pathology: The Center for Epidemiological Studies Depression Scale (CES-Depression scale; Radloff, 1977).

The CES-Depression Scale consists of 20 symptoms, 16 of which are worded negatively, while four are worded positively. Respondents are asked to indicate how often they experienced each of the symptoms during the past week on a four point scale ranging from rarely or none of the time (0) to most or all of the time (4). The items of the scale are assumed to represent all the major components of depressive symptomatology which include (1) depressed mood, (2) feelings of guilt and worthlessness, (3) feelings of helplessness and hopelessness, (4) loss of appetite, (5) sleep disturbance, and (6) psychomotor retardation (Radloff, 1975). The scale was found to have very high internal consistency (.85 to .90) and test-retest reliability (.51 to .67). Validity was established by patterns of correlations with clinical ratings

of depression. The scale was also able to discriminate between clinical groups and general community groups. One South African study (Pretorius, 1991) has replicated both the reliability (alpha coefficient of 0.90) and factor structure of the CES-D.

Procedure

Questionnaires were administered to students enrolled for the Research and Statistics module of the Psychology course during their regular class sessions. They were informed that the purpose of the questionnaires was twofold: for research purposes and also to collect data that could be used to illustrate various statistical techniques. The students were informed that participation was entirely voluntary, that they should complete the questionnaires anonymously and that confidentiality was assured.

Construction of the FORQ

It has been stated that fortitude derives from positive appraisals of (1) the self and the abilities of the self, (2) the family environment, and (3) the support from others. This view of fortitude defines operational categories that could be used to generate items. In the empirical study that has led to the formulation of the construct of fortitude (Pretorius & Heyns, Under Editorial Review) a range of questionnaires was used to assess the potential health-sustaining and stress-reducing role of a number of individual and environmental factors. A factor analysis of all these instruments identified three latent factors, which formed the basis for the development of the construct of fortitude. The questionnaires used in this previous study were therefore used to select items to represent the three domains of fortitude. The item sampling was done from the following questionnaires: Personal Competence Scale (Campbell, Converse, Miller, & Stokes (1960 1960), Self-esteem

Scale (Rosenberg, 1965), Problem Solving Inventory (Heppner & Petersen, 1982), Network Orientation Scale (Vaux, Burda, & Stewart, 1986), Social Support Questionnaire (Sarason, Levine, Basham & Sarason, 1983), the Perceived Social Support Scale (Procidiano & Heller, 1983), the Inventory of Socially Supportive Behaviors (Barrera, Sandler & Ramsay, 1981) and the Family Environment Scale (Moos, 1986). It was decided to select items proportionate to the length of the original scale. For example, the Family Environment Scale consists of 90 items and therefore 11 of these items were selected. On the other hand, the Personal Competence Scale consists of only 8 items and therefore only 2 of these items were selected for inclusion. Items were selected from the original questionnaires based on the item-total correlation and the contribution that these items made to the reliability of the original questionnaires. For example, in the case of the Personal Competence Scale the two items with the highest item-total correlation, that contributed to the total reliability of the scale were selected. A total of 36 items was selected in this way and each of the three domains were represented by 12 items. These 36 items were then independently rated by 2 senior psychology students and 2 senior law students. These students were instructed to sort the 36 items into three categories: self, family and others. Of the 36 items there was agreement among the four raters with regard to 24 of the items. There was no agreement on 12 of the items and these 12 items were subsequently dropped from the pool of items. A four-point scale ranging from "does not apply" to "applies very strongly" was used and some of the items had to be rephrased in order to be suitable for use with a four-point scale. In a small pilot (N=18) four of the items had a negative item-total correlation and these items were subsequently dropped: The remaining 20 items represented the three domains as follows: self-appraisals - 7 items, family-appraisals

- 7 items, support-appraisals - 6 items.

Results

Normative data for the FORQ

The descriptive statistics for the FORQ are presented in Table 2.

Table 2

Descriptive statistics for the FORQ

Scale	Mean	Std. dev	Number of items	Scaled mean ^a
Self-appraisals	21.33	3.68	7	3.05
Family-appraisals	19.91	4.81	7	2.84
Support-appraisals	16.61	3.94	6	2.77
Fortitude	57.79	9.43	20	2.89

^a Mean scaled in terms of a 4-point scale ranging from "does not apply" to "applies very strongly".

The scaled means indicate above average appraisals as well as a higher level of fortitude. A comparison of the subscales indicates more positive self-appraisals than family- or support-appraisals.

Reliability of the FORQ

The estimates of internal consistency (coefficient alpha) for the FORQ are reported in Table 3.

Table 3

Reliabilities of the FORQ

Scale items	Item-total r	Alpha if item deleted
SELF-APPRAISALS:		
Pretty sure of myself	.45	.70
Positive attitude myself	.61	.67
No trouble making up mind	.38	.72
Trust ability to solve problems	.51	.69
Satisfied with self	.49	.69
Weigh consequences when making decision	.34	.73
Think I am no good	.38	.72
SUBSCALE RELIABILITY		.74
FAMILY-APPRAISALS:		
Learning new things important in family	.48	.81
Plenty of attention for everyone in family	.50	.81
Rely on family	.55	.80
Deep sharing relationship with family	.67	.78
Members of family help solve problems	.73	.77
In family tell each other about problems	.57	.80
Activities in family well planned	.48	.81
SUBSCALE RELIABILITY		.82
SUPPORT-APPRAISALS:		
Many people count on to help	.42	.77
Satisfied with support from others	.60	.71
Satisfied with those I can count on	.56	.72
Know someone will be around for assistance	.52	.73

(table continues)

Table 3 (continued)

Scale items	Item-total r	Alpha if item deleted
Friends give moral support I need	.55	.72
Friends give good advice	.45	.74
SUBSCALE RELIABILITY		.76
FORTITUDE		.85

The item-total correlations of the various subscales ranged between 0.38 and 0.77 and all the items contributed significantly to the total reliability. The alpha for the various subscales can be considered very satisfactory since it ranged between 0.74 and 0.82. The reliability of the total scale (fortitude) was 0.85, which can be considered highly satisfactory.

Validity of the FORQ

Initial estimates of the validity of the FORQ were established through factor analytic procedures as well as the relationship of fortitude to measures of well-being and to those instruments that constituted the item pool for the FORQ.

Content validity

Content validity of the FORQ was assured through the process of selection of items. These items were sampled from a range of previously validated measures that have been used to measure related constructs. In addition, only items that were correctly sorted into the three categories by independent raters were used.

Factorial validity of the FORQ

To examine the factorial structure of the FORQ both exploratory and confirmatory factor analysis were used. A principal factor analysis with varimax rotation resulted in three factors with eigenvalues greater than unity. The result of this factor analysis is reported in Table 4.

Table 4

Factor loadings for the FORQ

Scale item	Factors		
	I	II	III
Members of family help solve problems	.81		
Deep sharing relationship with family	.76		
Rely on family	.73		
In family tell each other about problems	.70		
Activities in family well planned	.56		
Plenty of attention for everyone in family	.53		
Learning new things important in family	.53		
Positive attitude myself		.78	
Pretty sure of myself		.67	
Satisfied with self		.64	
Trust ability to solve problems		.62	

(table continues)

Table 4 (continued)

Scale item	Factors		
	I	II	III
No trouble making up mind	.52		
Think I am no good		.48	
Weigh consequences when making decision		.44	
Satisfied with support from others			.72
Friends give moral support I need			.69
Know someone will be around for assistance			.66
Friends give good advice			.66
Satisfied with those I can count on			.65
Many people count on to help			.59

The three factors accounted for 46% of the variance. The three factors replicated the hypothesized structure of fortitude. The items that loaded on Factor I are the family-appraisals, those that load on Factor II are the self-appraisals while the support-appraisals loaded on Factor III.

Confirmatory factor analysis using latent variable analysis (LISREL VII) was also used. In such a latent variable analysis a hypothesized model is fitted to a correlation (or covariance matrix). In the model the intercorrelations between items (or groupings of items) are regarded as the response variables and the hypothesized factors are regarded as the latent variables underlying the measured items. The LISREL VII program (Jöreskog & Sörbom, 1989) was used for the latent variable analysis. The extent to which the conceptual model (i.e. the hypothesized factor

structure) adequately represents the data is determined by the goodness-of-fit test (χ^2). In a well-fitting model the probability value for the χ^2 statistic should exceed a standard cut-off in the chi-square distribution ($p > .05$). In addition to the chi-square, the following are also provided: (1) The coefficient of determination indicates how well the observed variables serve as measurement of the latent variables. It ranges between zero and one, with large values being associated with good models. (2) The goodness-of-fit index (GFI) is another measure of the over-all fit of the model and can assume values between zero and one, with large values being associated with good models.

(3) Modification indices indicate which parameters should be freed in order to improve the fit of the model. A significant modification index suggests which parameters should be freed in a modified model. Each of the subscales of the FORQ was divided into a number of random clusters (i.e. self = 2 clusters, family = 2 clusters, support = 2 clusters). The conceptual model to be tested is indicated in Figure 1.

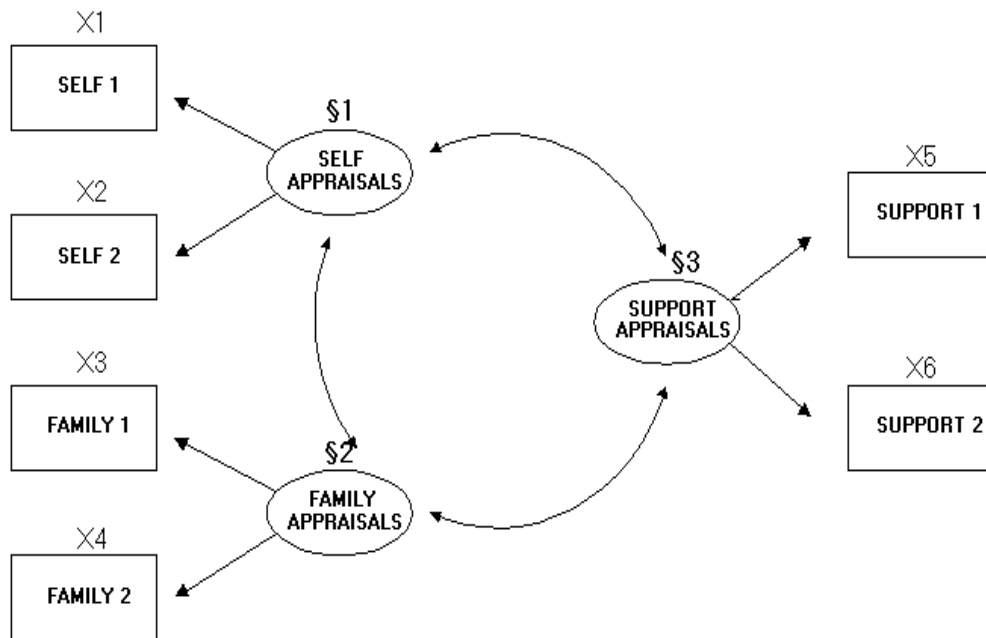


Figure 1 Conceptual model of FORQ structure for confirmatory factor analysis

In this model six measurement variables (X1 to X6) were presumed to be represented by three latent variables (>1 to >3). The LISREL analysis indicated that the model fit the data to an acceptable degree ($\chi^2 = 3.20$, $df = 6$, $p > 0.05$, $GFI = .99$, Coefficient of Determination = .99). The LISREL estimates for the model are indicated in Table 5.

Table 5

LISREL estimates for final FORQ model

Cluster	Self	Family	Support
Self1	1.716	.000	.000
Self2	1.456	.000	.000

(table continues)

Table 5 (continued)

Cluster	Self	Family	Support
Family1	.000	2.283	.000
Family2	.000	2.066	.000
Others1	.000	.000	1.981
Others2	.000	.000	1.570
Self	1.000		
Family	.523	1.000	
Support	.369	.436	1.000

Both exploratory as well as confirmatory factor analyses, therefore supports the hypothesized factorial structure of the FORQ. The intercorrelations between the subscales of the FORQ are reported in Table 6.

Table 6

Intercorrelations between subscales of the FORQ

Scale	Self	Family	Support	Fortitude
Self	1.00			
Family	.46**	1.00		
Support	.38**	.48**	1.00	
Fortitude	.72**	.84**	.81**	1.00

** p < 0.01

The intercorrelations between the subscales are all moderate (ranging between 0.38 and 0.48) indicating that these subscales, although related, are sufficiently independent. The correlation between the subscales and the total scale is relatively high (0.72 to 0.84), indicating that all of these subscales contribute significantly to the measurement of fortitude.

Predictive validity of the FORQ

The FORQ was correlated with measures of psychological well-being (Positive and Negative Affectivity Schedule, Satisfaction with Life Scale and Short Happiness and Affect Research Protocol) and psychological distress (CES-Depression Scale). These correlations are reported in Table 7.

Table 7

Correlations between FORQ and measures of psychological well-being and distress

Criterion	Self Appraisals	Family Appraisals	Support Appraisals	Fortitude
Depression	-.41**	-.35**	-.39**	-.50**
Satisfaction	.52**	.34**	.30**	.50**
Well-being	.40**	.29**	.37**	.46**
Positive Affect	.52**	.28**	.36**	.49**
Negative Affect	-.42**	-.25**	-.27**	-.40**

** p < 0.01

The relationships are all in the expected directions. The domains of fortitude and fortitude itself are all positively related to indices of well-being and negatively related to distress. The correlations range between -0.27 and 0.52, indicating strong and consistent relationships between fortitude and measures of psychological well-being and distress.

Concurrent validity of the domains of FORQ

Although fortitude is presented as a new construct that could explain how people manage to stay well, the domains of fortitude have been studied separately in other contexts. As stated previously, the item pool for the FORQ consisted of the following instruments: Personal Competence Scale (Campbell *et al.*, 1960), Self-esteem Scale (Rosenberg, 1965), Problem Solving Inventory (Heppner & Petersen, 1982), Network Orientation Scale (Vaux, *et al.*, 1986), Social Support Questionnaire (Sarason, *et al.*, 1983), the Perceived Social Support Scale (Procidiano & Heller, 1983), the Inventory of Socially Supportive Behaviors (Barrera, *et al.*, 1981) and the Family Environment Scale (Moos, 1986). Scores on these instruments were therefore used to determine the concurrent validity of the FORQ. The self-appraisals domain was correlated with the Personal Competence Scale, The Problem Solving Inventory and the Self-esteem Scale. The family-appraisals domain was correlated with the family support subscale of the Perceived Social Support Scale, as well as the Cohesion, Intellectual-cultural Orientation, Expressiveness and the Organisation subscales of the Family Environment Scale. The support-appraisals domain was correlated with the Number and Satisfaction subscales of the Social Support Questionnaire, the Inventory of Socially Supportive Behaviors, and the support from friend subscale of the Perceived Social Support Scale. These relationships are presented in Table 8.

Table 8

Correlations between domains of fortitude and measures of self, family and support

Criterion	Self Appraisals	Family Appraisals	Support Appraisals
Self-esteem	.76**		
Competence	.26**		
Problem-solving	.62**		
Family support		.84**	
Intellectual-Cultural		.60**	
Cohesion		.75**	
Expressiveness		.54**	
Organisation		.54**	
Supportive Behaviors			.48**
Satisfaction with support			.63**
Number of support			.64**
Support from friends			.42**

** p < 0.01

The results indicate very strong and significant relationships between these measures and the domains of fortitude. It would appear from the size of the coefficients that self-esteem and appraisal of problem-solving skills contribute strongly to the measurement of self-appraisals. On the other hand, family support and cohesion are the strongest indicators of family-appraisals, while satisfaction with support as well as quantity of support contributes most to support-appraisals. Overall, the results appear to confirm the validity of the FORQ.

Conclusion

The Fortitude Questionnaire (FORQ) is offered as a psychometrically sound instrument to assess fortitude, a stress-resistant construct identified in previous research. Preliminary evidence indicates that the FORQ is a highly reliable and valid measure of the construct of fortitude. Both exploratory as well as confirmatory factor analyses supported the hypothesized three-factor structure of fortitude. Fortitude was related to measures of well-being and distress as well as to those instruments used as item pool for the selection of items.

In line with the tradition of cumulative social science research, our study of stress-resistant resources over the years has led to the formulation of a theory of fortitude. The construct of fortitude, should in this regard be seen as an integrating construct, representing the interplay of various resources like social support and self-esteem.

The existence of a reliable and valid instrument for measuring this construct enables the implementation of a research agenda, which would include amongst others further validation of the FORQ and studying the health-sustaining and stress-reducing effects of fortitude.

If "stressors are omnipresent in human existence" (Antonovsky, 1979, p. 9.), our research efforts would be more fruitful if we concentrate on those characteristics that enable people to stay healthy, rather than merely focusing on what we know are the negative consequences of stress. This line of research where the emphasis is on coping efforts supports the assertion by Kobasa (1982) that *"Staying healthy in the face of stressful life events is...seen as an indicator of adjustment and even optimal behavior...Given this one can argue that the determination of those characteristics that keep people healthy under stress furthers the understanding of*

human development and well-being" (p. 5).

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