

Confirmatory factor analysis on the measurement of five salutogenic constructs

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ABSTRACT

The aim of the research was to establish the factor structure of five salutogenic constructs in order to better understand the dynamics of salutogenic behaviour among university administrative staff. The behavioural constructs were sense of coherence, hardiness, self-efficacy, learned resourcefulness and potency. One measuring instrument per construct was administered on a random sample of 215 staff members. Strong inter-correlations were found between all the constructs. Confirmatory factor analysis indicated a three-factor structure consisting of sense of coherence/potency, hardiness/potency and self-efficacy/learned resourcefulness. The results confirmed firstly sense of coherence and secondly hardiness as separate constructs, potency as a supporting and self-efficacy/learned resourcefulness as a third generic construct. These findings could in future be used in the development of coping mechanisms by administrative staff during stressful times such as organisational change and transformation.

Keywords: salutogenesis, salutogenic functioning, psychological well-being, sense of coherence, hardiness, self-efficacy, learned resourcefulness, potency, coping mechanisms, confirmatory factor analysis

INTRODUCTION

Salutogenic functioning forms part of the subject field of psychofortology (Coetzee & Cilliers 2001) and the relatively new positive psychology paradigm (Sheldon & King 2001), defined as the science of psychological well-being and positive subjective experience, including constructs such as quality of life, authentic happiness, autonomy, self-regulation/determinism, optimism, hope, wisdom, talent and creativity. The vision of positive psychology is to understand and foster the factors that allow individuals, groups, organisations and communities to flourish (Keyes & Haidt 2003), display positive emotions (Seligman 2003), develop strengths (Aspinwall

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& Staudinger 2003) and grow towards optimal well-being (Snyder & Lopez 2002). As such, this field of study is increasingly used as a theoretical basis for organisational inputs such as staff, management, leadership and career development (Kossuth & Cilliers 2002) and a conceptualisation of coping skills during stressful times, such as change, transformation, re-structuring and mergers (Carr 2004) and even sick leave (Motshela 2001). Presently, the operationalisation of many positive psychology constructs still lacks clarity in terms of their factor structures and psychometric application in South African organisations (see Wissing 2000).

SALUTOGENESIS

Instead of studying abnormal behaviour, salutogenesis focuses on the origins of health and wellness (in Latin, *salus* means health; in Greek, *genesis* means origins), the resulting strengths and successful coping with life's stressors (Antonovsky 1987) and the development of personal and social resources and adaptive tendencies that result in effective coping behaviour and growth.

The central thesis of the salutogenic model is that stressors are omnipresent in human existence, and even with a high stressor load, many people survive and even cope well (Antonovsky 1979). Thus, the salutogenic question is why some people struggle to cope and others cope successfully in spite of omnipresent stressors. In trying to answer this question, Antonovsky (1987) presented the salutogenic model of health, referring to a cyclical process to explain an individual's position on what he termed the health ease/dis-ease continuum. He argued that through life experiences, individuals develop generalised resistance resources (GRRs), which he defined as any characteristic of the individual that facilitates avoiding or combating a wide variety of stressors. When the individual regularly experiences the availability of GRRs, personality construct characteristics develop that prevent the individual from being subjected to some stressors. Subsequently, individuals view stressors as 'welcome' inputs after which the personality characteristics will decisively determine the extent to which the individual will move on the health ease/dis-ease continuum. A feedback loop forms from the GRRs to the salutogenic personality constructs. Depending on previous experience of overcoming stressors, the GRRs will enhance the strength of the salutogenic personality constructs, which in turn will enhance the strength of the GRRs.

SALUTOGENIC FUNCTIONING IN THE WORKPLACE

According to Antonovsky (1987) the above positive view on coping behaviour also applies to the workplace, where a certain level of stress is necessary for effective performance. During the 1990s, South African research started to address the challenge of explaining the dynamics of psychological well-being (see Strümpfer

1990, 1995; Wissing & Van Eeden 1997). This contains correlation studies with various personal constructs (for example, anxiety, depression and neuroticism), work-related constructs (for example, stress, self-esteem, extraversion, conscientiousness and social support), as well as organisational constructs (for example, job involvement, organisational commitment [Strümpfer & Wissing 1998], job satisfaction [Naudé 1999], stressors and coping with change [Cilliers, Viviers & Marais 1998]).

Although the widely used instruments for the measurement of the salutogenic constructs – as suggested by Strümpfer (1990) – exhibit psychometric qualities such as reliability and validity, it is not clear whether their measurement confirms the underlying theoretical models used in explaining stress and coping with change in the various organisational settings in which they are used. Research on the correlations between different constructs has been reported. For example, Kossuth (1998) found high correlations between sense of coherence, self-efficacy and locus of control, and Breed (1997) and Viviers (1996) between sense of coherence, hardiness and learned resourcefulness. No research could be traced investigating the factor structure of a combination of constructs identified by Strümpfer (1990).

THE SALUTOGENIC CONSTRUCTS AND PERSONALITY PROFILE

For the purpose of this research, the following four of the primary and one of the secondary salutogenic constructs mentioned by Strümpfer (1990), were chosen:

- Sense of coherence (SOC)

SOC is defined as a global orientation that expresses the extent to which one has a pervasive, enduring, though dynamic feeling of coherence manifesting in the following behavioural experiences or dimensions (Antonovsky 1987): (1) comprehensibility – making sense of the stimuli deriving from one's internal and external environments in the course of one's living and experiencing them as structured, predictable and explicable; (2) manageability – the belief that resources are available to oneself, within oneself and from legitimate others to meet the demands posed by these stimuli, and being able to cope with the demands of the environment; (3) meaningfulness – the belief that life's demands are challenges worth engaging with and investing in, and being able to emotionally identify with and commit effort to handling these demands. Antonovsky (1979) noted that the strength of the SOC is connected to GRRs, facilitating effective tension management. He identified these as artifactual (which includes material resources such as money and wealth), cognitive-emotional-intrapersonal and emotional (knowledge, intelligence and ego identity), valuative-attitudinal-rationality, flexibility and farsightedness; interpersonal-relational (social support systems) and macro-socio-cultural (cultural norms and rules that control societal and

organisational behaviour). Antonovsky (1987) supported the notion that work has a significant role to play in shaping a person's SOC. A work environment that is predictable and manageable, where the employee can participate in decision-making and has a voice in regulating his/her work, enhances the SOC of the worker because work is meaningful. Strümpfer supports Antonovsky's (1987) view that work experiences strengthen the SOC. He states, "all else being equal, I can hardly see where such an orientation to work as outlined above can lead, other than to productive performance, recognition, reward, and promotion. In turn, these experiences would become work-related GRRs that will strengthen the sense of coherence further" (Strümpfer 1990: 270).

- Hardiness (HAR)

HAR is defined as a constellation of personality characteristics that function as a moderator and resistance resource in the encounter with stressful life events (Kobasa, Maddi & Kahn 1982). Kobasa (1982) identifies the following three dimensions: (1) commitment (versus alienation) is a belief in the truth, importance and value of what one is and what one is doing. It is also the tendency to involve oneself actively in a number of situations in life, such as work, family, friendship and social organisations; (2) control (versus powerlessness) is a tendency to believe and act as if, by and large, one can influence the events of one's life through what one imagines, says or does, with an emphasis on personal responsibility. According to Strümpfer (1990), this component and its items are identical with those of Rotter's I-E scale; (3) challenge (versus threat) is an expectation that change, rather than stability, is the norm in life and that change will present one with opportunities and incentives for personal development. Persons high in HAR easily commit themselves to what they are doing (rather than feeling alienated), generally believe that they can at least partially control events (rather than feeling powerless) and regard change as a normal challenge or impetus to development (rather than a threat) (Kobasa, Maddi, Pucetti & Zola 1985).

- Self-efficacy (SE)

SE is defined as the belief that one has the capabilities to exercise control over events that affect one's life, and to mobilise the motivational and cognitive resources and courses of action needed to meet given situation-demands (Bandura 1997). One sets high, challenging and achievable goals, shows commitment and exercises choice and control over events in one's life, which stimulates more success (Gist & Mitchell 1992). A responsive, encouraging and rewarding environment, valuing aspirations, engagement and accomplishments further stimulate self-efficacy and improve performance.

- Learned resourcefulness (LR)

LR is defined as an acquired repertoire of (mostly cognitive) behavioural skills according to which one self-regulates internal responses (such as cognition, emotions and pain) that interfere with the smooth execution of a desired behaviour (Rosenbaum 1990). LR is not a personality characteristic, but rather a set of complex behaviours that is in constant interaction with one's physical and social environment, and is evoked by many situations one uses when confronted by situations that call for self-control and self-regulation. It also provides the basis for further learning.

- Potency (POT)

POT is defined as the enduring confidence in one's own capacities, as well as confidence in and commitment to one's social environment, which is perceived as being characterised by a basically meaningful, predictable order and by a reliable and just distribution of rewards (Ben-Sira 1985). POT is therefore a stress-buffering mechanism that will limit the homeostasis-disturbing impact of an occasional failure in meeting a demand because of resource inadequacy. This implies that one has enduring confidence in one's own capacity, as well as confidence in and commitment to the 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 (1989) distinguishes two stages in this coping process, namely, the primary stage of responding to a demand upon confrontation with it and the secondary stage of restoring homeostasis if coping in the initial stage was inadequate. Moreover, there has to be a homeostasis-stabilising mechanism, over and above the normal resources of individuals, that is sufficiently powerful to moderate the impact of inadequate coping, hence preventing occasional disturbances of emotional homeostasis from deteriorating into stress.

The foregoing literature was integrated into the following personality profile of the salutogenic person (see Viviers 1996), forming the theoretical base of this research:

- Cognitive characteristics

Most of these constructs refer to an aspect of understanding or comprehensibility, which refers to the extent to which the individual experiences internal and external stimuli as ordered, structured and consistent. His/her perceptions make cognitive sense, he/she works towards making life understandable and tries to be flexible towards change. This also relates to control and the ability to interpret, evaluate and incorporate external stimuli in such a way that they fit into the individual's life plan. This requires cognitive flexibility relating to choices between possibilities.

The individual has the ability to regulate internal responses by means of cognitive control and by making use of self-regulating mechanisms. This style facilitates an easy way of life and stimulates self-effectiveness in evaluation and action. In summary, the individual has the ability to control stimuli and to adapt these stimuli to his/her normal life functioning. Comprehension makes it possible to see the stimuli in a positive light. The individual perceives and controls the stimuli in a positive way and ensures a positive outcome.

- **Affective characteristics**

The individual experiences life as emotionally meaningful. It is acceptable for him/her, as well as his/her perception of the environment's reaction, to allow conscious emotions to be expressed in a natural and spontaneous way. The individual is committed to life through his/her belief and value systems. The individual believes that there is a purpose in all life's events. Emotions are within the control of the individual, and failure is worked through instead of being rationalised away.

- **Motivational characteristics**

The individual manages life events in a flexible way and experiences change as a challenge. Events are perceived as being interesting. A repertoire of coping mechanisms, such as self-control and effective self-regulation, are at his/her disposal. The individual is highly task orientated.

- **Interpersonal characteristics**

The individual is committed to being involved in effective interpersonal relationships in an interdependent way. He/she makes use of social support systems to help in times of intense stress and strain.

THE PROBLEM STATEMENT, AIM, DESIGN AND CONTRIBUTION

The research question was formulated as follows: 'Do the operationalisation, inter-correlations and factor analysis performed on the foregoing five salutogenic functioning constructs confirm the salutogenic literature and personality profile?' The aim of the research was to establish the factor structure of the five salutogenic constructs. A survey and questionnaire design using already standardised measuring instruments was used (Breverton & Millward 2004). These results could contribute towards a better understanding of the dynamics of the general salutogenic construct and behaviour in organisations, as well as of individual and organisational coping with organisational change. Administrative staff members served as the unit of analysis in this research. According to Sperry (2004), their task is an important and very stressful one, especially in times of organisational change. More specifically, they

manage operating systems, focus on how things should be done, work on containing order as well as the status quo, and thus add to the primary task and effective leadership of the organisation.

METHOD

Population and sample

This research was conducted on a population consisting of the administration section (N=2 116) at a large university (which comprises 62% of the total staff complement). A random sample of 310 was selected, representing all the administrative departments and job categories proportionately. Of these, 215 completed the measuring instruments, forming the final sample (N=215). This complied with psychometric guidelines, whereby factor analysis requires a sample of number of items times five (Gorsuch 1997). The sample typically consists of an administrative employee of between 28 and 41 years of age, male (54%)/female (46%), white (54%)/black (46%), with a grade 12 qualification and between four and 12 years' work experience.

Measuring instruments

- Sense of coherence (SOC)

The Orientation to Life Questionnaire (Antonovsky 1987) measures SOC in three dimensions, namely comprehensibility (SOC-COM), manageability (SOC-MAN) and meaningfulness (SOC-MEA). Antonovsky reported internal consistency of between 0.82 and 0.95, construct validity of between 0.38 and 0.72, test-retest reliability of 0.54 over a two-year period, as well as good content and criterion validity. Strümpfer & Wissing (1998) confirm the reliability and construct validity in many South African studies, Kossuth (1998) reports a Cronbach alpha of 0.85 and Basson & Rothmann (2001) 0.89.

- Hardiness (HAR)

The Personal Views Survey (Hardiness Institute 1985) measures HAR in three dimensions, namely, commitment (HAR-COM), control (HAR-CON) and challenge (HAR-CHA). Kobasa (1982) reports significant reliability and internal validity correlations for commitment (0.85/0.85), control (0.68/0.70) and challenge (0.70/0.71). Funk (1992) reports a Cronbach alpha of 0.75.

- Self-efficacy (SE)

The Self-efficacy Scale (Bandura 1977) measures SE in a singles score. Kossuth (1998) reports Cronbach alphas of 0.71 and 0.86, while Bandura (1977) and Feltz (1982) confirm the content validity.

- Learned resourcefulness (LR)

The Self-control Schedule (Rosenbaum 1990) measures LR in a single score. Rosenbaum (1990) reports test–retest reliability after four weeks involving 600 subjects ($r=0.96$) and Rosenbaum & Ben-Ari (1985) confirm the criterion-related validity of the scale.

- Potency (POT)

The Potency Scale (Ben-Sira 1985) measures POT in a single score. Ben-Sira reports a Cronbach alpha of 0.82 and also reports on the scale’s generally acceptable psychometric qualities.

- Biographical variables

A biographical questionnaire was drawn up to measure data on age, gender, race, qualification, work experience, department and job category.

Data collection

A letter containing permission from the head of the Personnel Division, clear instructions about completing the measuring instruments, contact numbers of the researcher in case any question should arise, the actual five salutogenic instruments, as well as the biographical questionnaire, were bound in a booklet. Together with a self-addressed envelop, this was hand-delivered to each of the 310 participants. Within two weeks, 215 completed booklets were returned.

Data processing

The statistical analysis was performed with the SAS (1985), and the confirmatory factor analysis was performed with the SPSS (Amos 1997) computer program. It was decided to consider all factor loadings \geq or $>$ 0.25 as significant (Stevens 1992). The following statistical analyses were conducted:

- Analysis of variance and reliability of measurement. To facilitate the comparison of the scores of the various measurement instruments, a one-way analysis of variance (F-test) was performed, transforming all scales to a percentile score. Item analysis and Cronbach alpha coefficients were computed for each instrument to determine its internal consistency reliability.
- Correlations. Pearson product moment correlations were computed between the five salutogenic measures and the biographical variables.
- Exploratory factor analysis. As the first step towards confirmation, exploratory factor analyses were computed, specifically principle factor analysis.
- Confirmatory factor analyses. This included promax and weighted varimax rotations. Chi-squares were computed to indicate the fit of the model.

Hypotheses

It was hypothesised that the operationalisation of the five salutogenic constructs (as described) would confirm the theoretical model of salutogenic functioning.

RESULTS

Analysis of variance and reliability of measurement

Table 1 gives the descriptive statistics, indicating the average to high functioning of the sample on all the constructs. The item analyses resulted in four negative correlations, leading to these items being omitted from further data processing, namely, SOC item 1 and HAR items 2, 22 and 24. The Cronbach alpha coefficients indicate that the internal consistency of each measurement was satisfactory. This corresponds with research on the reliability of these instruments as reported by Breed (1997), Kossuth (1998) and Viviers (1996).

Table 1: Descriptive statistics and Cronbach alpha coefficients (N=215)

Construct	Mean score	Standard deviation	Cronbach alpha
SOC-COM	67.98	7.08	0.71
SOC-MAN	62.48	6.08	0.69
SOC-MEA	51.34	5.32	0.73
HAR-COM	65.58	6.36	0.74
HAR-CON	67.00	5.82	0.74
HAR-CHA	45.67	6.91	0.70
SE	67.78	3.71	0.71
LR	66.22	5.74	0.71
POT	60.78	6.83	0.79

Correlations

- Salutogenic constructs

The product moment correlations are given in Table 2, indicating high inter-correlations between all the salutogenesis constructs.

- Biographic variables

Gender, race and qualification showed no relationship with salutogenic functioning. Age and experience correlated with HAR-COM and POT. Age also correlated significantly with HAR-CON and HAR-CHA. This means that SOC, SE and LR have no relationship with the measured biographical variables. Hardiness and potency seem to increase with age and commitment, and potency to increase as the individual gains work experience.

Table 2: Correlations between the five salutogenic constructs and their significance levels

Construct	1	2	3	4	5	6	7	8	9
1. SOC-COM	1.00 0.000								
2. SOC-MAN	0.46 0.000	1.00 0.000							
3. SOC-MEA	0.33 0.000	0.67 0.000	1.00 0.000						
4. HAR-COM	0.44 0.000	0.40 0.000	0.47 0.000	1.00 0.000					
5. HAR-CON	0.43 0.000	0.38 0.000	0.38 0.000	0.75 0.000	1.00 0.000				
6. HAR-CHA	0.30 0.001	0.31 0.001	0.32 0.001	0.45 0.000	0.47 0.000	1.00 0.000			
7. SE	<i>0.18</i> <i>0.049</i>	0.24 0.013	0.31 0.000	0.33 0.000	0.43 0.000	0.31 0.001	1.00 0.000		
8. LR	0.37 0.000	0.25 0.009	0.37 0.000	0.45 0.000	0.52 0.000	0.24 0.009	0.44 0.000	1.00 0.000	
9. POT	0.29 0.003	0.50 0.000	0.60 0.000	0.58 0.000	0.53 0.000	0.41 0.000	0.34 0.000	0.36 0.000	1.00 0.000

Note: All $p < 0.01$ except values in italics/bold, where $p < 0.05$

Exploratory factor analysis results

Table 3 contains the two-factor structure with Eigen values. Factor 1 included HAR, SE and POT. Factor 2 included SOC and POT. Because three factors had an Eigen value greater than unity, a three-factor solution was also considered. Table 4 contains the three-factor promax rotated solution for the salutogenic constructs. Factor 1 included SOC and POT, factor 2 HAR and factor 3 LR and SE. This suggested that the hypothesis to be tested in this study was that salutogenic functioning has a three-factor underlying factorial structure.

Table 3: Exploratory factor analysis: two-factor structure (N=215)

Construct	Factor 1	Factor 2	Eigen values (h)
HAR-CON	86 (1)	- (2)	1.0
HAR-COM	69	-	1.0
LR	55	-	1.0
HAR-CHA	43	-	1.0
SE	40	-	1.0
SOC-MEA	33	29	0.8
SOC-MAN	-	89	0.7
SOC-COM	-	83	0.6
POT	29	52	0.3

Note:

- (1) Printed values are multiplied by 100 and rounded off to the nearest integer
- (2) Values less than 25 are omitted to ease interpretation

Table 4: Exploratory factor analysis: three factor structure (N=215)

Construct	Factor 1	Factor 2	Factor 3
SOC-MAN	90 (1)	- (2)	-
SOC-COM	83	-	-
POT	52	-	-
SOC-MEA	28	-	-
HAR-CON	-	81	-
HAR-COM	-	73	-
HAR-CHA	-	49	-
LR	-	-	99
SE	-	-	28

Note:

(1) Printed values are multiplied by 100 and rounded off to the nearest integer

(2) Values less than 28 are omitted to ease interpretation

Confirmatory factor analysis

Figure 1 gives a graphical representation of the model that was tested and also gives the value of the Chi-square test statistic (Chi-square=64.308; $p=0.328$).

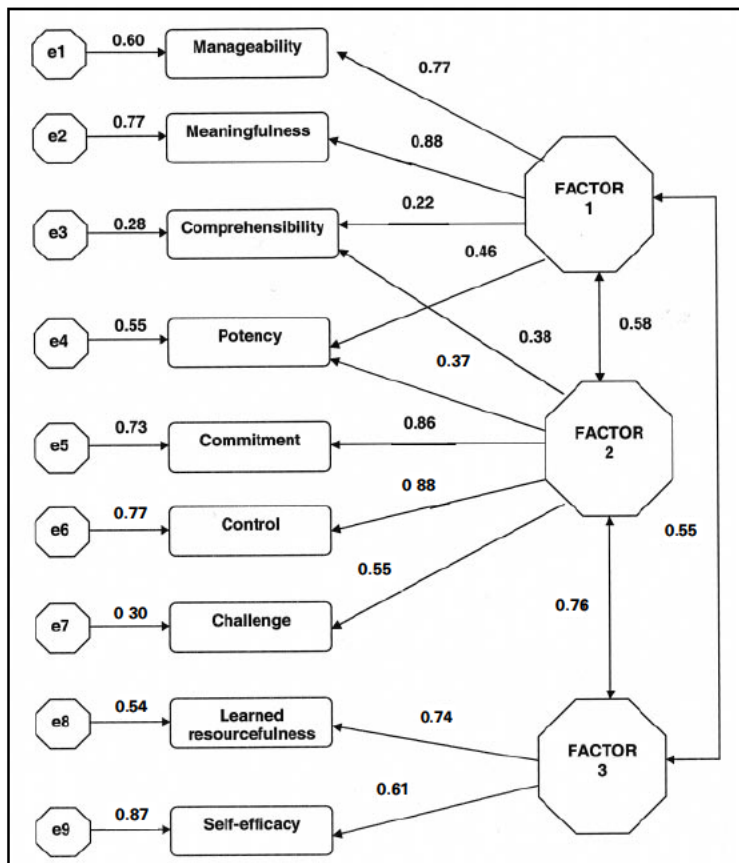


Figure 1: Confirmatory factor analysis

The hypothesis, namely that the model fits the data, could not be rejected. The three-factor model was thus seen as providing a good picture of the underlying causal structure of the general salutogenesis construct. The three factors in the model are themselves highly inter-correlated, which is to be expected since they all relate to the construct salutogenic functioning.

DISCUSSION

The reliability analysis indicated that all the scales used in this study could be regarded as reliable. The scoring and scaling of the measuring instruments indicated that the sample functioned average to high on all the salutogenic constructs.

The correlations indicated a strong relationship between all the salutogenic constructs. Although no studies measuring these five constructs could be traced, the findings correspond with South African research results by Barnard (2001), Cilliers & Kossuth (2002) and Viviers (1996), in which some of the constructs were measured in different combinations. Salutogenic functioning is not influenced by gender, race or qualification. It was found that hardiness and potency increase with age and experience. This means that with increasing age, an individual will be more committed to work, experience work as satisfying, consider himself/herself as having control over fate, see his/her work life as challenging and have confidence in his/her own capabilities to cope with change and stress. This implies that the employee adapts to changing working conditions. It could also be reasoned, however, that the older worker has had the opportunity to move out of the job if the demands do not suit him/her. A kind of selective mechanism might thus be at work, which could explain the correlations that were found.

The exploratory factor analysis indicated that salutogenic functioning consists of three factors: (1) sense of coherence/potency, (2) meaningfulness (as part of sense of coherence/hardiness/potency) and (3) self-efficacy/learned resourcefulness.

The confirmatory factor analysis indicated the following three highly inter-correlated factors, which corresponded with the high inter-correlations between the constructs (see Table 2) and confirmed their relationship as sub-dimensions of the general construct of salutogenic functioning:

- Factor 1: Sense of coherence/potency

The first factor consisted of the three sense of coherence dimensions of meaningfulness (0.88), manageability (0.77), comprehensibility (0.22) and potency (0.46). The low score for comprehensibility indicated a weak cognitive component in this factor. It could therefore be said that this factor represents the affective experience. Life is experienced as emotionally meaningful; stress is reduced by

expressing emotions openly and spontaneously; demands are experienced as challenges; mechanisms are used to prevent tension turning into lasting stress; and life is seen and experienced as structured, predictable and comprehensible.

- Factor 2: Sense of coherence comprehensibility/hardiness/potency

The second factor consisted of the three hardiness dimensions of control (0.88), commitment (0.86), challenge (0.55), as well as sense of coherence comprehensibility (0.38) and potency (0.37). Firstly, this represents a cognitive component – life is experienced as structured, predictable and explicable, based on the belief of control and the belief that life-forming events can be influenced. Secondly, this represents an affective component – a commitment to and involvement in life’s activities; a view that life and change are normal and challenging; with change regarded as a stimulus for development; and mechanisms are used to prevent tension turning into lasting stress.

- Factor 3: Self-efficacy/learned resourcefulness

The third factor consisted of learned resourcefulness (0.74) and self-efficacy (0.61). Firstly, this represents a cognitive component – the skills of evaluating and judging circumstances in a realistic manner and trust in one’s capabilities to cope with demands. Secondly, this represents an affective component – the perception of the self as an efficient functioning person. Thirdly, this represents a motivational component – the skills of self-motivation in regulating internal responses interfering with the smooth execution of desired behaviour.

The relationship between Factors 2 and 3 (0.76) is stronger than the relationship between Factor 1 and Factors 2 (0.58) and 3 (0.55). This indicates that sense of coherence/potency forms a primary factor, with hardiness/sense of coherence comprehensibility/potency linking closely to self-efficacy/learned resourcefulness.

This research confirmed the following about the five chosen constructs of salutogenic functioning:

- Sense of coherence

This construct was confirmed as the strongest, which could explain why it is used so often (see Strümpfer & Wissing 1998). Antonovsky’s (1979, 1987) work and the sense of coherence construct are applied to almost all fields within psychology (see Rabichund 1999). The sense of coherence was confirmed as comprising the dimensions of meaningfulness, manageability and comprehensibility. The relatively low loading of comprehensibility (0.22) on Factor 1 indicated that the cognitive aspect of sense of coherence, described by Antonovsky (1993) as an evaluation of a stressful situation, is secondary to the dynamic feeling of

confidence and meaningfulness (the affective component), as well as the manageability (the motivational component) and usage of stress buffering mechanisms (represented by potency).

- **Hardiness**

This construct was confirmed as a second factor. Hardiness was confirmed as comprising the dimensions of control, commitment and challenge. Control as the strongest dimension was supported by sense of coherence comprehensibility (both representing cognitive components). Challenge was supported by potency (both representing motivational behaviour). Evaluated on the basis of the existing literature, it seems that there is an increase in references to this construct (see Strümpfer & Wissing 1998), especially in nursing (Cilliers 2003).

- **Potency**

This construct acted as a linking and supporting factor between sense of coherence and hardiness. This implies that potency is not a clear and separate factor, but rather a generic and, as Ben-Sira (1989) calls it, a stress-buffering and homeostasis-facilitating construct between the self and the environment. This may explain the research on potency in understanding post-traumatic war situations (Dasberg 1982) as well as life and situational variables such as morbidity, the effect of life events on a kibbutz, couple's resilience, how children handle divorce, social support groups and job satisfaction (see Agho, Mueller & Prince 1993).

- **Self-efficacy and learned resourcefulness**

These two constructs were not confirmed as separate constructs. They seem to act together as a generic and supportive factor, representing the individual's cognitive skills and inner judgement in regulating his/her own responses and capabilities during stressful events (see Bandura 1989). These constructs seem to explain stressful situations where a choice is implied (for example, in terms of a career [Goldberger & Breznitz 1993]) or where physical and psychiatric pain is experienced (Keren, Mester, Asphormas & Lerner 1983).

CONCLUSION AND RECOMMENDATIONS

The resulting picture of the underlying causal structure of the general salutogenic functioning construct indicates a good fit between the conceptualisation and the operationalisation of these five salutogenic functioning constructs. The results that have been discussed confirm Antonovsky's (1991) description of the constructs sense of coherence, hardiness and self-efficacy as separate personality constructs,

Rosenbaum's (1990) reference to sense of coherence, hardiness and learned resourcefulness as being separate general attributes, as well as Strümpfer's (1995) research in South Africa.

Researchers that are interested in salutogenesis as a paradigm and a way of personal functioning should take note of these results, since they indicate the strength of this model in explaining coping behaviour in organisations. These constructs could be used as part of the new developing positive psychology framework towards organisational development, including appreciative enquiry. It is also suggested that research be conducted to understand the relationship between these five salutogenic and other constructs of psychological well-being, such as self-actualisation, emotional intelligence, resilience, engagement (see Jackson, 2004) at the individual level, as well as social support at the group level. In general, organisations are encouraged to implement salutogenic thinking in understanding the phenomena and symptoms of distress and illness in the organisation, and in coping with enduring stress in overcoming the difficulties of change management.

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