A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment?

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ABSTRACT: *Resources that protect against the development of psychiatric disturbances are reported to be a significant force behind healthy adjustment to life stresses, rather than the absence of risk factors. In this paper a new scale for measuring the presence of protective resources that promote adult resilience is validated. The preliminary version of the scale consisted of 45 items covering five dimensions: personal competence, social competence, family coherence, social support and personal structure.*

The Resilience Scale for Adults (RSA), the Sense of Coherence scale (SOC) and the Hopkins Symptom Checklist (HSCL) were given to 59 patients once, and to 276 normal controls twice, separated by four months.

The factor structure was replicated. The respective dimensions had Cronbach's alphas of 0.90, 0.83, 0.87, 0.83 and 0.67, and four-month test-retest correlations of 0.79, 0.84, 0.77, 0.69 and 0.74. Construct validity was supported by positive correlations with SOC and negative correlations with HSCL. The RSA differentiated between patients and healthy control subjects. Discriminant validity was indicated by differential positive correlations between RSA subscales and SOC.

The RSA-scale might be used as a valid and reliable measurement in health and clinical psychology to assess the presence of protective factors important to regain and maintain mental health.

Key words: resilience, scale development, validation, sense of coherence, psychiatric symptoms

Individuals who sustain normal development despite long-term stress, adversity or maltreatment, are frequently labelled 'resilient' (Garmezy and Nuechterlein, 1972; Garmezy, 1981; Rutter, 1985; Steele, 1987; Zimrin, 1987; Cowen and Work, 1988; Egeland, Carlson, Sroufe, 1993; Block and Kremen, 1996). Longitudinal studies conducted over four decades, such as the Kauai study (Werner, 1989, 1993, 2001) and the Lundby study (Cederblad, 1996), point to several key features characterizing resilient people who overcome difficult life conditions. Generally, they are more flexible than vulnerable people and cope by using several protective resources either within themselves or in their environment. Several authors (Werner, 1989; Rutter, 1990; Werner, 1993; Garmezy, 1993) now classify these protective resources into

- psychological/dispositional attributes;
- family support and cohesion; and
- external support systems.

These are the most significant determinants of a healthy adjustment to long-term stresses. The overall aim of this study was to develop a valid scale for measuring the presence of such protective resources and to examine whether these resources differentiated between patients and non-patients.

Most prospective studies report that resilient people draw heavily on favourable dispositional attitudes and behaviours like internal locus of control, pro-social behaviour and empathy, to face life stresses. They have a positive self-image and display great optimism for the future (Werner and Smith, 1992; Cederblad, Dahlin, Hagnell and Hansson, 1993; Cederblad, 1996; Blum, 1998). Moreover, resilient people seem to have a strong ability to organize their life (Clausen, 1993). Such

personal dispositions and attitudes promote in return, supportive relationships with family members and friends. Conversely, the lack of social support that many patients experience is related to their problem with reciprocating social support from others (Kringlen, 1990). Resilient individuals also manage to distance themselves psychologically from the trouble that mentally ill parents inflict (Watt, 1995). Compared to more troubled individuals, they generally value siblings as a more important source of emotional support (Werner and Smith, 1992). They work harder to resolve marital conflicts (Werner, 2001). Obviously, resilience does not protect the individual from negative life events but resilient individuals seem to cope more functionally and flexible with stress. These characteristics are developed early in life by the formation of a secure attachment to other people, which may reduce the vulnerability to developing psychiatric disorders significantly (Svanberg, 1998). Gender differences in resilience have been investigated less often, but one consistent finding is that resilient women tend to elicit and provide more social support (Werner, 2001). In sum, resilience is considered a multi-dimensional construct (Luthar, Doernberger and Zigler, 1993). The concept not only refers to important psychological skills or abilities but also to the individual's ability to use family, social and external support systems to cope better with stress. Measurement scales for assessing overall improvements in mental health should thus include these factors.

Two scales to measure resilience have appeared in the literature. Jew, Green and Kroger (1999) developed a scale for children and adolescents from the cognitive appraisal theory of Mrazek and Mrazek (1987), which emphasizes 12 essential skills that are important for coping adequately with life stress. The other measure (Wagnhild and Young, 1990, 1993) was developed from interviews with 24 elderly American women who had successfully dealt with various losses typical of old age. A follow-up study of the scale on elderly people failed to validate the scale (Aroian, Schappler-Morris, Neary, Spitzer and Tran, 1997). However, none of the scales included measurement of social factors (such as family/external support or social competence) known to be essential to withstand life stress. Age-specific features may also make these scales inappropriate to measure resilience in the adult group.

Hence, a preliminary version of the Resilience Scale for Adults (RSA) was developed in an earlier study (Hjemdal, Friborg, Martinussen and Rosenvinge, 2001). The resulting scale consisted of 45 items covering five dimensions labelled 'personal competence' (16 items), 'social competence' (12 items), 'social support' (nine items), 'family coherence' (five items) and 'personal structure' (four items). This factor solution was in accordance with the overall classification of resilience (Werner, 1989; Rutter, 1990; Werner, 1993; Garmezy, 1993). The internal consistency (Cronbach's alpha) was high for all dimensions, ranging from 0.92 to 0.74 and for all the items combined (total $\alpha = 0.93$) as well.

As it was desirable to level out the number of items along the dimensions, 21 new items were generated under the following sub-dimensions: personal competence and social competence (one item, respectively), family coherence (five items), and personal structure (four items). The initial factor solution excluded the generated locus-of-control items. As the construct is considered highly important for a resilient outcome (Werner, Smith, 1992; Cederblad, Dahlin, Hagnell, Hansson, 1993), 10 new items pertaining to internal/external control were generated for the present study (for example, 'if I succeed in school, it is because I am competent' or 'success comes from hard work').

The purposes of the present study were

- to test the original factor structure of the RSA after adding new items, and to estimate new internal consistencies;
- to study the test-retest reliability in a non-patient sample; and
- to test important aspects of the instrument's construct validity.

All the subscales of the RSA were expected to correlate significantly and positively with a measure of psychological/personal adjustment – the Sense of Coherence scale (SOC) (Antonovsky, 1993, 1998). However, as SOC assesses personal adjustment skills, the social and family subscales of the RSA were expected to correlate less positively with the SOC scale. Next, the RSA was expected to correlate negatively with an inventory of psychiatric symptoms (Hopkin's Symptom Checklist, HSCL) (Nettelbladt, Hansson, Stefansson, Borgquist and Nordström, 1993).

A widespread method in establishing construct validity is to assess differences among variables known to differentiate the groups (Streiner and Norman,

1995). As such, the RSA was expected to correlate positively with level of education and indices of occupational adaptation. It has been a consistent finding that people with psychiatric problems report less protective factors in their environment alleviating stress and preventing maladjustment (Werner and Smith, 1992). Thus, it was expected that patients seeking psychiatric treatment in an outpatient clinic would report less degrees of available protective resources in comparison to the control group.

Method

Subjects

Patients were recruited from an adult outpatient clinic in Tromsø, northern Norway. A total of 183 patients, 117 women (63.9%) and 66 men (36.1%), offered psychotherapy for the first time, were contacted. Altogether, 45 women between 18 and 75 years (M = 33.7, SD = 13.0) and 14 men between 19 and 75 years (M = 36.2, SD = 13.0) responded. The response rate was 32.2%. Several investigations were done to examine whether the low response rate produced a biased sample. The age differences between patients that participated (M = 34.6, SD = 12.8) and those who refused (M = 34.8, SD = 13.5), was insignificant. However, the number of men who refused to participate (41.9%) were significantly higher than the number who did participate (23.7%) χ^2 (1, n = 183) = 5.75, $p < 0.05$). As a t-test indicated no significant differences in psychiatric symptoms between women and men, however, this was considered of minor importance. Finally, and most importantly, the study investigated whether the patient sample (N = 59) was systematically different, in terms of psychiatric diagnoses (Table 1), from the patients that were contacted (N = 183), and all patients that started in treatment during the year 2000 (N = 398). Due to four cells with expected cell frequencies less than five, Fisher exact tests were run instead of chi-square statistics. However, no significant differences in the proportions of diagnoses emerged between the samples. The number of patients with two psychiatric diagnoses was not significantly different between the samples.

Normal controls were selected by Statistics Norway at random (N = 977, 51% women and 49% men) among inhabitants from 25–50 years (M = 37.0, SD = 7.3) living in Tromsø. In all, 162 women (M = 35.6 years of age, SD = 7.5) and 128 men (M = 37.1 years of age, SD = 7.3) responded. The response rate was 31%. There were no gender differences between the original sample and those who participated ($p > 0.05$). Although those who participated (M = 36.9, SD = 7.3) were slightly older than the original sample (M = 36.1, SD = 7.4), it was of no practical importance. Four months later, 130 women (M = 36.0 years of age, SD = 7.6) and 97 men (M = 37.4 years of age, SD = 7.1) returned the second set of the questionnaires. The response rate was 79%.

Procedure

Information was collected once in the patient sample and twice in the control sample, with a four-month follow-up. The random control sample was invited to

Table 1. The proportion of psychiatric diagnoses among patients that participated (N = 59), all patients that were contacted (N = 183), and all patients who started in treatment at the outpatient clinic during the year 2000 (N = 398)

ICD-10 diagnoses	Patients (N = 59)	%	Total Contacted[1] (N = 183)	%	All year 2000[2] (N = 398)	%
Schizophrenia (F20, F22)	1	1.7	4	2.2	22	5.5
Bipolar disorders (F31)	2	3.4	6	3.3	13	3.3
Depressive disorders (F32-F34)	24	40.7	67	36.6	105	26.4
Anxiety disorders (F40-F42, F45)	6	10.2	24	13.1	67	16.8
PTSD/adjustment disorders (F43)	14	23.7	35	19.1	111	27.9
Eating/personality disorders (F50/F60)	1+1	3.4	7+6	7.1	8+14	5.5
Other diagnoses	10	16.9	34	18.6	58	14.6

[1] A Fisher exact test found no significant differences in the proportions of diagnoses between the patient sample and the drop-outs (Fisher (6, n = 183) = 6.40, p = 0.37).

[2] The same analysis found no differences between the patient sample and the total number of patients during the year 2000 (Fisher (6, n = 398) = 10.31, p = 0.13).

participate through postal invitations. The invitation used the word 'personal skills' instead of 'resilience'. For the clinical sample, appointments for starting psychotherapy and the invitations to participate in the study were mailed at the same time but in separate envelopes. After returning the completed questionnaires, the participants received a lottery ticket (value $ 2.5).

Measurements

Demographic data were age, gender, level of education, current employment status, years of work experience.

Sense of Coherence Scale (SOC)

The 29-item SOC self-report scale uses a seven-point Likert scale, with positive and negative semantic phrases at each endpoint. Higher scores reflect stronger SOC. Thirteen of the items are reversely scored to avoid response set bias (acquiescence). The scale is used worldwide and is highly reliable (Cronbach's alpha ranging from 0.82 to 0.95) and valid as a measure of overall mental health adjustment (Antonovsky, 1993, 1998). The SOC correlates negatively with perceived stress, trait anxiety and current depression (Frenz, Carey and Jorgensen, 1993; Sammallahti, Holi, Komulainen and Aalberg, 1996).

The Hopkins Symptom Check List-25 (HSCL)

The HSCL is a 25-item short version of the Symptom Check List (SCL-90). It is a self-report inventory that rates the presence of depression, anxiety and somatization. It uses a four-point scale ranging from one ('not at all') to four ('very much'). Higher scores indicate more psychiatric/affective symptoms. A mean score of ≥1.55 indicates a probable psychiatric problem, whereas a score of ≥1.75 indicates a probable need for psychiatric treatment (Nettelbladt, Hansson, Stefansson, Borgquist and Nordström, 1993). The scale has also proven highly reliable in Norwegian samples (α = 0.91) (Lavik, Laake, Hauff and Solberg, 1998; Moum, 1998).

Marlowe-Crowne Social Desirability Scale (MCSDS)

The MCSDS was applied to identify biased answers, looking for the effects of social desirability and acquiescence. Social desirability is a conscious choice to present oneself in an overly positive manner. Acquiescence bias is an unconscious tendency to agree or disagree independent of the content in the items. The Norwegian short-version of the MCSDS (α = 0.65) contains 10 items, of which five are reversed (Rudmin, 1999). The social desirability index was computed by reversing half of the items before calculating the mean. The acquiescence bias index was computed by calculating the mean of the 10 items without reversing any scores.

Removal of participants

To ensure the data quality, participants who met the following criteria were deleted from the data pool:

- more than 10% missing data;
- non-serious responses;
- obvious misunderstanding of the questionnaires;
- a *z*-score > 2 on the social desirability index, a *z*-score > 2 on the acquiescence index or a *z*-score < 2 on the nay-saying-bias index.

In sum, 35 participants were deleted (six patients and 29 controls). This yielded a patient sample of 59 participants and a control sample of 276 participants. Four months later, the control sample consisted of 230 participants.

Results

Replicative findings

Before subjecting the resilience items to factor analyses, we examined whether they correlated highly with indices for social desirability, acquiescence or nay-saying bias. Such correlations were small (range 0.11 to 0.27).

It was decided that each dimension of the factor structure should contain at least five items. An exploratory principal components analysis with a varimax rotation, instead of a confirmatory analysis, was preferred to further reduce the number of items. The factor analysis was based on the control sample only (N = 276), as it would be theoretically contradictory to include subjects with current psychological problems for the selection of items. Factors with Eigenvalues less than 1 were excluded. This procedure generated 13 dimensions explaining 63% of the variance. However, the component solution was not acceptable as only two or three items loaded on the

sixth factor and beyond. The scree-plot was then examined for a clear bend in the curve, which emerged at the fifth component. Inspecting the items in each dimension, the five-component solution was the same as in the previous study (Hjemdal, Friborg, Martinussen and Rosenvinge, 2001). This accounted for 41 percent of the variance, and excluded 33 items. Six items with high side loadings (<0.30) on other dimensions were also removed. One item from the fifth factor with a high side loading was, however, retained to keep five items in the dimension. The factor solution and the factor loadings consisted of 37 items (Table 2). The five dimensions were labelled 'personal competence', 'social competence', 'family coherence', 'social support' and 'personal structure'. Intercorrelations between the factors were low to moderate ($r = 0.22$ to 0.46, $p < 0.01$), except for a non-significant correlation between 'social support' and 'personal structure'.

Reliability estimates (internal consistency and test-retest)
The internal consistency (Chronbach's α) of all the contrast scales (SOC, HSCL, MCSDS) was satisfactory high (Table 3), indicating adequate psychometric properties. The internal consistency of the subscales of the RSA was satisfactory, ranging from 0.67 to 0.90. The test-retest correlations were all satisfactory for the subscales of RSA, ranging from 0.69 to 0.84 ($p < 0.01$).

Item-total correlations were calculated for every subscale. The item-total correlations belonging to 'personal competence' ranged from 0.51 to 0.75, 'social competence' from 0.48 to 0.74, 'family coherence' from 0.56 to 0.74, 'social support' from 0.43 to 0.70, and 'personal structure' from 0.37 to 0.48.

Gender and age effects
All the subscales of the RSA were examined for gender and age differences (Table 4). Analyses were only done on the control sample to reduce the number of subjects with psychiatric symptoms in the group. The significance-level was set to <0.01 to reduce type I error. A t-test indicated that women reported significantly higher levels of 'social support' than men ($t(273) = 4.27$, $p < 0.001$), whereas men reported sub-significantly higher levels of 'prsonal competence than women ($t(273) = -2.21$, $p = 0.03$). Correlational analyses on age differences, found 'personal structure' to be positively correlated with age ($r = 0.17$, $p < 0.01$).

Relationship with other tests
A widely used and accepted method for assessing construct validity (Streiner and Norman, 1995) is to examine associations with a convergent/similar scale (such as SOC) and a discriminant/dissimilar scale (such as HSCL). The correlations between the subscales of the RSA and the SOC were all positive (Table 5), ranging from 0.29 to 0.75 (all $p < 0.01$). As expected, the 'personal competence' subscale correlated highest ($r = 0.75$, $p < 0.01$) with SOC, while the other four subscales correlated less positively with the SOC, ranging from $r = 0.29$ to $r = .45$ ($p < 0.01$). A similar pattern was found between the subscales of the RSA and the HSCL, with the highest negative correlation between 'personal competence' and HSCL ($r = -0.61$, $p < 0.01$). The other subscales correlated less negatively with HSCL, ranging from –0.19 to –0.37 (all $p < 0.01$). The correlation between the SOC and the HSCL was thus negative ($r = -0.75$, $p < 0.01$).

The RSA's construct was further examined against three demographic variables expected to be associated with higher resilience:

- number of years of education;
- employment; and
- number of years in work.

Using alpha-level <0.01 to reduce type I error, years of education were not associated with any of the RSA subscales. Concerning employment status (0 = not employed, 1 = employed), three of the subscales, 'personal competence', 'social competence' and 'family coherence', were positively and significantly correlated with holding a job ($r = 0.18$, 0.22 and 0.17, respectively, all $p < 0.01$).

Number of years in work was positively and significantly correlated with 'family coherence' and 'personal structure' ($r = 0.17$ and 0.17, respectively, $p < 0.01$).

Differences between the patient and the control sample
The study was examined whether the patient sample reported lower degrees of resiliency than the control sample. Again, alpha level was set to $p < 0.01$. All the subscales of the RSA differentiated between the samples (Table 6), finding higher degrees of resilience in the normal control sample, except from 'social support' that reached a sub-significant level ($p < 0.04$). To ensure that the patient sample was compared to a

Table 2. The factor solution for the non-clinical sample showing the distribution and loading of items in the five dimensions; 1 = personal competence, 2 = social competence, 3 = family coherence, 4 = social support, and 5 = personal structure (N = 276)

	Dimensions:				
Translated items from Norwegian	1	2	3	4	5
I believe in my own abilities	0.77				
Believing in myself helps me to overcome difficult times	0.69				
I know that I succeed if I carry on	0.65				
I know how to reach my goals	0.64				
No matter what happens I always find a solution	0.61				
[a] I am comfortable together with other persons	0.60	0.52			
My future feels promising	0.58				
I know that I can solve my personal problems	0.58				
I am pleased with myself	0.55				
I have realistic plans for the future	0.54				
I completely trust my judgements and decisions	0.47				
a At hard times I know that better times will come	0.44			0.37	
I am good at getting in touch with new people		0.87			
I easily establish new friendships		0.75			
It is easy for me to think of good conversational topics		0.66			
[a] I easily adjust to new social milieus	0.30	0.65			
It is easy for me to make other people laugh		0.64			
I enjoy being with other people		0.59			
a I know how to start a conversation	0.36	0.55			
I easily laugh		0.54			
It is important for me to be flexible in social circumstances		0.51			
[a] I experience good relations with both women and men		0.39		0.34	
There are strong bonds in my family			0.82		
I enjoy being with my family			0.78		
In our family we are loyal towards each other			0.72		
In my family we enjoy finding common activities			0.66		
Even at difficult times my family keeps a positive outlook on the future			0.65		
In my family we have a common understanding of what's important in life			0.64		
There are few conflicts in my family			0.61		
I have some close friends/family members who really care about me				0.82	
I have some friends/family members who back me up				0.76	
I always have someone who can help me when needed				0.67	
I have some close friends/family members who are good at encouraging me				0.63	
I am quickly notified if some family members get into a crisis				0.59	
I can discuss personal matters with friends/family members				0.53	
I have some close friends/family members who value my abilities				0.47	
[a] I regularly keep in touch with my family			0.46	0.46	
There are strong bonds between my friends				0.39	
Rules and regular routines make my daily life easier					0.69
I keep up my daily routines even at difficult times					0.67
I prefer to plan my actions					0.64
I work best when I reach for a goal					0.58
I am good at organizing my time	0.34				0.46
Variance explained (%)	21	7	5	4	4

Note: Total variance explained (41%). Factor-loadings < 0.30 are omitted. The table shows a crude English translation of the Norwegian original version.
[a] Items were removed due to side loading.

Table 3. The reliability estimates for all scales (the RSA, SOC and HSCL) based on the control sample (N = 217)

Dimensions	Internal consistency	Test-retest (four months)
	Cronbach's α	*r*
1 Personal competence	0.90**	0.79**
2 Social competence	0.83**	0.84**
3 Family coherence	0.87**	0.77**
4 Social support	0.83**	0.69**
5 Personal structure	0.67**	0.74**
Total SOC	0.94**	0.86**
Total HSCL	0.92**	0.77**
MCSDS	0.67**	0.47**

Note. ** p < 0.01 (two-tailed).

Table 4. The differences in mean and standard deviations between women and men on resilience subscale scores, based on the control sample (N = 273); the effect sizes indicate the magnitude of the differences.

Dimensions	No. items	Women (N = 153)		Men (N = 120)		*t*	Hedge's *d*
		M	SD	M	SD		
1 Personal competence	10	5.28	0.96	5.51	0.77	–2.21*	–0.29
2 Social competence	7	5.19	1.02	5.14	1.01	0.47	0.05
3 Family coherence	7	5.13	1.26	5.13	0.98	0.05	0.00
4 Social support	8	5.91	0.88	5.45	0.86	4.27***	0.53
5 Personal structure	5	5.11	0.97	5.10	0.91	0.09	0.01

Note. * p < 0.05 (two-tailed), *** p < 0.001 (two-tailed).

Table 5. The correlations between the subscales of the RSA, the SOC and the HSCL Scales (N = 335)

Scales	SOC	HSCL
1 Personal competence	0.75**	–0.61**
2 Social competence	0.44**	–0.32**
3 Family coherence	0.45**	–0.37**
4 Social support	0.29**	–0.19**
5 Personal structure	0.33**	–0.21**

Note. ** p < 0.01 (two-tailed).

psychological healthy sample, all control subjects with symptom-scores above 1.55 were removed. New comparisons between the patient and the healthy sample confirmed the results by indicating somewhat greater differences. The effect size of the differences between the samples was greatest for 'personal competence' (Hedge's d = 1.59) and 'family coherence' (Hedge's d = 1.06).

Control subjects also reported significantly higher degrees of sense of coherence (SOC) and less symptoms of psychiatric problems (HSCL). The mean symptom-score in the patient sample (2.24) was far above the cut-off value (>1.75), which indicates a probable treatment need (Nettelbladt et al., 1993). In contrast, the symptom score in the control sample (1.42) was lower than the cut-off value (<1.55) indicating a probable psychiatric problem (Nettelbladt et al., 1993).

Finally, the proportion of subjects in the control sample who reported experiencing critical life events at the second data collection, was calculated. Out of

Table 6. The differences in mean and standard deviations between the patient (n = 59) and the control sample (N = 276), the patient and the psychological healthy sample (n = 199); the effect sizes indicate the magnitude of the differences

Scales	Patient sample (N = 59)		Control sample (N = 276)			Healthy Sample[1] (N = 199)		
	M	SD	M	SD	*t*, Hedge's *d*	M	SD	*t*, Hedge's *d*
Personal competence	4.11	1.30	5.39	0.88	7.08***, 1.33	5.56	0.76	8.07***, 1.59
Social competence	4.67	1.07	5.17	1.01	3.30**, 0.49	5.25	1.00	4.02***, 0.57
Family coherence	4.22	1.42	5.13	1.14	4.45***, 0.76	5.37	0.97	5.64***, 1.06
Social support	5.41	1.02	5.71	0.90	2.12*, 0.33	5.80	0.83	2.79**, 0.44
Personal structure	4.58	0.99	5.10	0.95	3.38***, 0.54	5.14	0.93	3.84***, 0.59
SOC	3.82	0.86	4.85	0.75	8.56***, 1.34	5.10	0.63	10.50***, 1.86
HSCL	2.25	0.57	1.42	0.37	-10.55***, 2.01	1.24	0.14	-13.32***, 3.37

Note. * p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed).
[1] The psychologically healthy sample was derived by removing control subjects with a mean symptom-score (HSCL) above 1.55.

230 subjects, 32 (13.9%) confirmed that they had been experiencing stressors that considerably influenced the ability to cope with everyday demands.

Discussion

The factor structure and the reliability from the original RSA-study (Hjemdal, Friborg, Martinussen and Rosenvinge, 2001) were successfully replicated. Due to the low-to-moderate intercorrelations between the subscales of the RSA, the dimensions should be regarded as subscales measuring different, but all various and positive aspects of the concept of resilience. This supports the theoretical understanding of resilience as a multidimensional phenomenon (Cicchetti and Garmezy, 1993; Garmezy, 1993; Luthar, Doernberger and Zigler, 1993). Along with the satisfactory test-retest reliability, the RSA seems to be satisfactorily operationalized. In contrast to the existing resilience scales (Wagnhild and Young, 1990, 1993; Jew, Green and Kroger, 1999), the RSA covers all three of the main categories of resilience.

The first category of 'dispositional attributes' was comprised by the three dimensions 'personal competence', 'social competence' and 'personal structure'. 'Personal competence' measured level of self-esteem, self-efficacy, self-liking, hope, determination and a realistic orientation to life. 'Social competence' measured extraversion, social adeptness, cheerful mood, an ability to initiate activities, good communication skills and flexibility in social matters. 'Personal structure' measured the ability to uphold daily routines, to plan and organize.

The second category, 'family cohesion/warmth', was comprised by the dimension 'family coherence' that measured amount of family conflict, cooperation, support, loyalty and stability.

The third and last category 'external support systems' was comprised of the dimension 'social support' that measured access to external support from friends and relatives, intimacy, and the individual's ability to provide support.

In summary, the five-dimensional scale corresponds well with the overall categorization of resilience, recapitulated as characterized by (i) personal/dispositional attributes, (ii) family support and (iii) external support systems (Werner, 1989; Rutter, 1990; Werner, 1993; Garmezy, 1993).

Reliability and validity

The internal consistency of the RSA subscales was high, although the last dimension was in the lower part of the recommended range (Streiner and Norman, 1995). Although the reliability was satisfactory, it was somewhat lower than the original study (Hjemdal, Friborg, Martinussen and Rosenvinge, 2001). This may be explained by the lower number of items in the present RSA-scale, as compared to the previous version, which generally reduce the Cronbach's alphas (Cronbach, 1990). The item-total correlations for all subscale were moderate to high, further indicating adequate reliability, except for the last factor, 'personal structure', in which one item total correlation dropped below 0.40.

All three explorations of the construct validity were strongly supported. First, all the RSA subscales were

positively related to the SOC and negatively related to the HSCL. Discriminant validity between the RSA and the SOC was also established by finding differing correlation coefficients between the RSA subscales and the SOC. A high sense of coherence indicates how confident an individual feels that the outcome of a stressful situation will be favourable (Antonovsky, 1998). This is promoted by the ability to comprehend, manage and find meaning in life challenges (Antonovsky, 1993). Such an ability is more indicative of a personal competence than of, for example, social support. As expected, 'personal competence' correlated highest with the SOC, whereas the other subscales correlated poorly to moderately with SOC. As a stronger sense of coherence also foster stronger feelings of coherence in family and social matters (for example, that other people's behaviour is understandable), the moderate correlations with 'social competence' and 'family coherence' indicate tentative convergent validity for these subscales as well. Still, the study did not include other established scales to confirm the convergent validity of the social and family subscale, and consequently, further validation studies are needed.

Secondly, like previously developed scales (Wagnhild and Young, 1990, 1993; Jew, Green and Kroger, 1999), the RSA differentiated between a patient and randomly chosen sample from the normal population of Tromsø. Patients reported less access to protective factors within all five resilience dimensions. It has been a consisted finding in earlier studies (Werner, 2001) that individuals with psychological troubles have fewer personal, social and external resources available to protect them from stress than more resilient individuals have. 'Social support' was the only subscale that reached a sub-significant level. The lower effect size for this subscale may be explained by the high number of women in the patient sample (76.3%), and thereby elevating the 'social support' scores. Third, current employment status (holding a job) was moderately and positively associated with higher levels of self-reported 'Personal competence', 'social competence' and 'family coherence'. 'Years of work experience', on the other hand, were positively associated with 'family coherence' and 'personal structure'. These findings are in line with previous results from longitudinal findings (Werner, 1993). Surprisingly, though, 'years of education' was not associated with higher degrees of resilience, although this have been found essential for successful adaptation (Werner, 2001).

Gender and age differences

Women reported significantly more access to social support than men, whereas men reported more personal competence than women. Although the last difference was much weaker, it was still not negligible. In scale development such gender differences are generally unwanted. However, these results match Werner's longitudinal results (Werner, 1989), indicating that men feel personally more competent than women and that women generally are more skilled in using social support. Similar findings come from a meta-analysis that found higher self-esteem and assertiveness among men, than among women. Women, on the other hand, reported more extraversion, trust, gregariousness and nurturance (Feingold, 1994). In another overview (Cross, Marcus, 1993), women were more socially sensitive and showed greater signs of stress than men when intimate persons experienced straining life situations. As these differences are common findings in the literature, these items were retained in the RSA.

The only subscale to be positively associated with age, was 'personal structure'. The ability to organize, plan and maintain important structures and routines to succeed with career and educational goals, along with a careful planning choice of spouse, is one central characteristic of resilient individuals (Werner, 2001). The present results support the importance of organizing and planning for adult resilience, and that these characteristics may take more time to develop.

Sample limitations

As it was difficult to reach a sample consisting of individuals that had successfully adapted and dealt with long-term stress and difficulties, a random sample from the population of Tromsø was contacted instead. This may raise doubts about the external validity of the scale. The control sample may, however, resemble a resilient group as the majority of the population generally overcomes several stressors, like loss of family members, disease, troubled relatives or financial problems, without developing difficulties. Indeed 32 of the 230 subjects in the control sample reported experiencing taxing stressors during the four-month period, such as serious somatic diseases, loss of significant persons (death, separation, conflicts) and children in

trouble with the law. People in the normal population are resilient in the sense that most individuals hold positive views of themselves (positivity bias), display optimism for the future and an illusion of control (Taylor and Brown, 1988). To increase the probability of comparing the patient sample against a psychologically healthy and thus more resilient sample, subjects in the control sample with elevated symptom scores were removed. New comparison between these samples confirmed the results by finding somewhat greater effect size differences. The probability of reaching individuals with resilient characteristics in this sample was therefore considered acceptable. In future studies the probability of reaching a truly resilient sample (those who have experienced taxing stressors but still managed to cope) may be increased by including life-event scales together with resilience and coping scales to identify the subgroup of people that have experienced adversities but still managed to cope effectively.

For both samples, the mean age was representative for an adult population (25 and 50 years). The response rate was low, but still comparable with that of previous survey studies (Green and Boser, 1998), particularly when using repeated measures. Although the response rate was within the expected range, a low response rate threatens the external validity if the sample is systematically biased. This was not the case for the patient sample in terms of age and psychiatric diagnoses, with the last being the most important indicator. The proportions of psychiatric diagnoses in the patient sample were not significantly different from the patients who were invited to participate, and all patients in treatment during the year 2000. The patient sample may thus be regarded as representative of the patients that seek psychiatric services at this particular clinic.

In sum, then, the age distribution, response rate, the small differences in the dropout characteristics, as well as a successful replication of the factor structure, indicate acceptable generalizability of the scale.

Further validation

In upcoming studies on construct validity of the RSA, the scale will be compared with other establishment instruments, such as an inventory for:

- personality (Costa and McCrae, 1985), to examine how resilience is related to, for example, neuroticism, which is a significant parameter for predicting long-term psychological functioning;
- dispositional optimism (Scheier and Carver, 1985), which is a central aspect of resilience, to see how these co-vary and interact in the prediction of mental health;
- health locus of control (Levenson, 1973) to investigate how resilience is associated with causal attributions/beliefs about what influence good health;
- social intelligence (Silvera, Matinussen and Dahl, 2001) to test if self-reported social competence in the RSA co-variates with self reported social skills;
- coping styles (Lazurus, 1993) to see if resilient people cope more actively (for example, solve problems and seek information), rather than passively (for example, avoidance or wishful thinking) with life problems;
- life events, to examine how strongly the RSA predicts individual differences in adaptational and coping capacity when adversities/life problems occur.

Clinical use and implications

General resilient characteristics are presumed to be more stable over time, than, for example, psychiatric symptoms. They might therefore be more prognostic of psychological growth during psychotherapy, as well as providing better predictions of relapse rate and patients' ability to cope with present and coming difficulties. This contention comes from several studies on developmental psychopathology, claiming that underlying developmental level on social/emotional and cognitive indices (pre-morbid functioning) is a considerable predictor of good prognostic outcome (for an overview, see Glick, 1997). In these studies, pre-morbid social functioning has been found to be the most potent predictor of clinical outcome variables. As the RSA scale not only measures social competence but also other important protective resources, one would expect similar, or perhaps better, predictive ability.

In clinical and health psychology, it may be used as an assessment tool of protective factors important to prevent maladjustment and psychological disorders. For the practitioner it points out key areas of psychological and psychosocial interventions to help patients building strength, by fostering protective resources known to strengthen patients' adaptability and self-reliance.

Acknowledgement

We are grateful for the financial aid that the Psychiatric Research Center for the Counties of Finnmark and Tromsø provided to support the project.

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