

**RESILIENCE IN INFERTILE COUPLES
CONSTRUCTION AND VALIDATION OF THE RESILIENCE ASSESSMENT
QUESTIONNAIRE—A CONFIRMATORY ANALYSIS**

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Abstract: Over the last decades, the construct of resilience has attracted an increasing attention in both the medical and behavioral sciences. This construct has been defined in a variety of ways, including the ability of a person to bounce back or recover from a period of stress, to not become ill despite significant adversities, and to function „above the norm” in spite of stress or adversities. To capture the key factors that are associated with resilience, we designed a standardized measure: the Resilience Assessment Questionnaire in Infertile Couples/RAQIC. In its working version, RAQIC contains 12 sentences that were intended to operationalize four factors. Data reported in this paper are based on responses obtained from a sample of 66 infertile couples who asked for specialized help by attending a medical clinic from Iași. The present study provides information on internal (construct) validity and reliability (internal consistency) of RAQIC. Models based on the confirmatory factor analysis (CFA) represent a particular application of the structural equation modeling (SEM). The main objective of CFA is to test whether the observed data fit a hypothesized measurement model for a well-delimited construct. These factors were established based on literature and items were formulated based on previous measures of resilience.

Keywords: *questionnaire, resilience, infertility, confirmatory factor analysis, construct validity.*

Theoretical Background

Resilience is described in terms of a desirable personality profile, with cognitive features as regarding resistance to stress; Garmezy proposes a dynamic conceptual model of resilience perceived as a process, a result of a very good adjustment despite menacing circumstances (Masten et al., 2005, pp. 74-88), providing us with a new theoretical framework for the development of research.

Resilience has been used in literature in order to describe three types of situations: a. persons who experienced traumatic events but who managed to recover very well; b. persons who belong to risk groups and who had much more success than it was expected from them; c. persons who succeed in adjusting and positively reacting despite negative aspects in their life. Researchers have been interested in the way adjustment works in children and adults who lived major traumas, but who succeeded in getting over them. Historical surveys took into account children who survived Holocaust and who became successful adults (Richardson, G. 2002).

Researchers were also preoccupied with children with schizophrenic parents who blossomed as future adults despite their deplorable life conditions, having become immune to stress surrounding them. The same author specifies that the invulnerability concept is surrounded by a mythical halo, considering that the child's adjustment has to be seen in the context of a certain threat which needs an examination of the resilience the child displays within his coping mode and development of resources facing challenges.

One of the most productive research is to be found in Garmezy et al.'s survey (1991), who undertook a research for more than 20 years at Minnesota University, related to positive

adjustment of children belonging to a risk group or who dealt with a lot of stressors during their life. This study also comprised children coming from groups with normal life conditions. Therefore, researchers studied relation between life stressors and competencies, resources. Researchers identified the fact that certain resources acted as moderator factors protecting these children, observing that resilience, the same with adjustment, was influenced by the constellation of protective or risk factors which are present within one's family or in society, making the living environment a challenging one (Masten et al., 1991).

Protective factors included the child's dispositional attributes, the family's characteristics and external supportive factors Garmezy (1991), Werner (1995), making a difference between the individual, family and community protective factors.

As regards the direct correlation between resilience and infertility, surveys indicate that resilience represents an unspecific protective factor against infertility distress, with an influence on quality of life. When couples benefit from counseling, it is necessary to especially focus on getting aware of resilience as a couple's resource method or as a generic coping way (Herrmann et al., 2011). Moreover, resilience was negatively associated to infertility distress and to general distress. Involvement in coping methods based on action was positively correlated to resilience (Werner, E., & Smith, R. (1992).

Objective

The current study aims to confirm correspondence of measurements accomplished in the previous survey by means of exploratory factorial analysis and to improve this model by performing a confirmatory factorial analysis within an extended sample (130 couples).

Methods

When creating the questionnaire (Dumitru, Turliuc, 2014), we started from mutual research results regarding internal factors such as coping, internal locus of control, self-efficacy, hardiness (Garmezy, 1985; Kumpfer, 1999; Luthans, Vogelgesang & Lester, 2006; Tedeschi & Kilmer, 2005), as well as external factors such as family and social support (Friborg et al., 2006; Hardy et al., 2004; Luthar et al., 2000; Werner & Smith, 1992).

The internal locus of control concept was launched by Julian Roter in 1954, explaining that persons with high internal locus of control are convinced that their choices will lead them whether to success, or to failure, having the ability to self-control and even to influence external world by trusting their own abilities, which determines them to look for information that will help them to influence people and situations. Thus, they tend to be specific, generalize less and approach each circumstance as being unique. Internal locus of control is an important component in infertility diagnosis, which is accompanied by a series of losses related to lifestyle and autonomy of one's own body.

As for social support and coping, Luthar, S., and Cicchetti, (2000). discovered that the social support's role in coping with stressing events varies according to individual evaluation of the degree of controlling the stressor. As for the individuals that perceive stress factor as being manageable, social support was proved to have an influence over coping strategies, with effects on psychological adjustment. However, as for persons who perceive stress factor

as being unmanageable, social support was demonstrated to directly influence psychological adjustment, without the mediator role of the coping strategies.

The first component, self-efficacy, involves an individual's belief in his or her ability to mobilize the motivation, cognitive resources and action to exert control over a given event (Bandura, 1997). Rutter (1987) described resilient individuals as possessing self-esteem and a belief in their own self-efficacy. When faced with adverse events, efficacious individuals tend to persist in a given task until success is achieved. Thus, unless individuals believe that they can achieve desired goals through their actions, they will have very little incentive to persevere in the face of adversity (Benetti & Kambouropoulos, 2006; Friborg et al., 2006; Wagnild & Young, 1993).

Over the last decades, the construct of resilience has attracted an increasing attention in both the medical and behavioral sciences. This construct has been defined in a variety of ways, including the ability of a person to bounce back or recover from a period of stress, to not become ill despite significant adversities, and to function „above the norm” in spite of stress or adversities (Werner, E., & Smith, R. (1992).. It has been emphasized that this ability plays a key role in relation to adjustment to the physical illnesses or chronic stressful circumstances. Through its psychological and social implications, infertility is experienced as one of the most negative and frustrating life events. Therefore, studying the role that resilience plays in how infertile women and their partners cope with this adversity and identifying factors associated with resilient functioning will help researchers and practitioners to better understand the psychological dimension of infertility and to designed effective ways to assists couples which face with this problem.

To capture the key factors that are associated with resilience, we designed a standardized measure: the *Resilience Assesment Questionnaire in Infertile Couples/RAQIC*. In its working version (for items, see Table 1), RAQIC contains 12 sentences that were intended to operationalize four factors, i.e. internal locus of control (e.g., „Depends on me to solve the problem of infertility”), coping focused on problem-solving (e.g., „I think rather how can I solve the problem of infertility than how it affects me”), perceived social support (e.g., „I talk with friends about the problem of infertility”) and self-efficacy (e.g., „I believe that I am a strong person and that I will succeed to overcome this difficult time”). Three items were designed *per* each factor. These factors were established based on literature and items were formulated based on previous measures of resilience. A respondent is asked to rate how frequent each infertility-related sentence is true for his or her own person.

Data reported in this paper are based on responses obtained from a sample of 66 infertile couples who asked for specialized help by attending a medical clinic from Iași. The present study provides information on internal (construct) validity and reliability (internal consistency) of RAQIC. Models based on the confirmatory factor analysis (CFA) represent a particular application of the structural equation modeling (SEM). The main objective of CFA is to test whether the observed data fit a hypothesized measurement model for a well-delimited construct (Byrne, 2010). The measurement model is based on theoretical approaches and/or previous analytic research. Using CFA, two hypothetical measurement models were investigated and compared with each other: a) a one-latent factor model (Figure 1) in which scores on the RAQIC were hypothesized to indicate a single construct (i.e.,

factors associated with resilience) and b) a model with four-latent factors (i.e., internal locus of control, problem-focused coping, perceived social support, and self-efficacy) which were allowed to freely covariate (Figure 2).

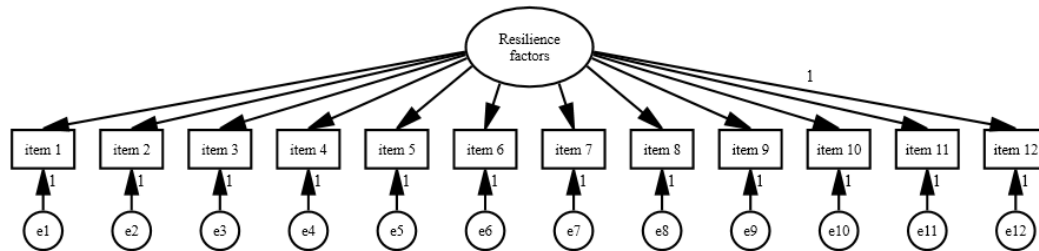


Figure 1. One-latent factor hypothetical measurement model for RFQ

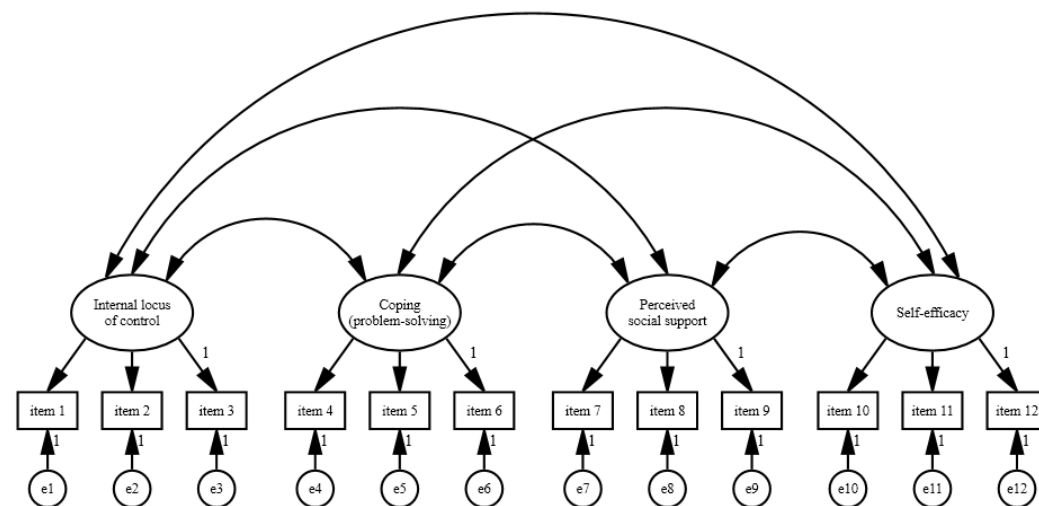


Figure 2. Four-latent factors measurement model for RFQ

Method

Sample

All marital or non-marital couples who attended a medical clinic specialized in reproductive medicine were recruited in the current sample ($N = 132$). Range for age of partners was 25-45 years. There was no significant association between gender and age ($\chi^2 = 6.70$; $df = 3$; $p = 0.082$). However, 42.4% of male partners and 59.1% of female partners were between 25 and 35 years old. The length of relationship ranged between one year and 15 years. Types of diagnostic were as follows: female infertility (34 couples), male infertility (8 couples), mix infertility (6 couples), and unknown causes (18 couples).

Measure

Participants completed the *Resilience Assessment Questionnaire for Infertile Couples* (RAQIC) as a part of meeting with psychologist. Responses were not anonymous. Responses were given in a Likert-type format with six points: 0 – *not at all true*, 1 – *rarely true*, 2 – *sometime true*, 3 – *often true*, 4 – *almost always true* and 5 – *always true*. For each item, the score ranged from 0 to 5. Two negatively formulated items (i.e., 2 and 12) were reversely

scored. For each scale, the score was given by the sum of the corresponding items (possible range: 0-15). In the present sample ($N = 132$), Cronbach's α coefficients were 0.60 (internal locus of control), 0.67 (problem-focused coping), 0.75 (perceived social support) and 0.71 (self-efficacy).

Data analyses

Data was analyzed using SPSS 21.0 and AMOS 20.0. Parameters of the hypothetical measurement models were estimated based on maximum likelihood (ML) procedure (Byrne, 2010). The SEM with ML procedure assumes that all observed variables have normal distributions (Bowen & Guo, 2012; Byrne, 2010). Therefore, for each observed variable (i.e., item score) the distribution was checked for normality by examining the skewness and kurtosis values. The SPSS package uses zero as reference value for skewness and kurtosis to decide if a distribution is normal or not. There is no clear cutoff to indicate an acceptable level of skewness and kurtosis. In a conservative approach, the researcher might conclude that a skewness value greater than 1 or less than -1 is problematic (Bowen & Guo, 2012). More problematic than skewness is kurtosis which severely impacts tests of variances and covariances. If kurtosis is greater than 1 or less than -1 , one might conclude that the distribution could be problematic. However, several simulations (Muthén & Kaplan, 1985; West, Finch, & Curran 1995) have found significant problems in the ML procedures arising with univariate skewness at least equal to 2 and kurtosis to 4 (in software packages using zero as reference value for a normal distribution). The multivariate kurtosis was estimated based on Mardia's coefficient which is reported in AMOS output. A non-significant value of CR (critical ratio for difference from zero) associated with this coefficient is desirable.

The goodness-of-fit of measurement models that we tested was estimated based on several indicators (Byrne, 2010): χ^2 (Fisher's chi-square exact test), degree of freedom (df) and significance level, χ^2/df , SRMR (standardized root mean square residual), GFI (goodness-of-fit index), AGFI (adjusted goodness-of-fit index), NFI (normed fit index), CFI (comparative fit index), and RMSEA (root mean square error of approximation). Since the value of RMSEA is sensitive to misspecifications of the relationship among variables and it is accompanied by a confidence interval which provides an indication of the precision of estimation, its use in applied research is strongly encouraged. According to Byrne (2010), an excellent model fit is based on a non-significant value for χ^2 and a value of ratio χ^2/df as small as possible, along to values as close as possible to 1 for GFI and AGFI, values higher than 0.95 for NFI and CFI, a value as close as possible to zero for SRMR and a value lower than 0.05 for RMSEA. Following the suggestions from literature, we considered a value of $2 < \chi^2/df \leq 3$ and a value of $0.05 < RMSEA \leq 0.08$ as indicating an acceptable fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). At the same time, values of SRMR lower than 0.08 and values of GFI and CFI ranging between 0.90 and 0.95 may indicate an acceptable fit (Bentler, 1990; Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003). As a supplementary criterion for model selection, Akaike's Information Criterion (AIC) was applied. The AIC is used in the comparison of two or more SEM models, with smaller values representing a better fit of the hypothesized model (Byrne, 2010).

Results

Preliminary analyses

In the initial dataset, absolute values of skewness ranged from 0.07 to 3.28 ($M = 1.56$; median = 1.62), while kurtosis ranged from 0.30 to 13.33 ($M = 3.51$; median = 1.89). Only items 1 and 10 were problematic when values of skewness and kurtosis were screened. Moreover, the Mardia's multivariate kurtosis coefficient (equal to 92.20) was significantly different from 0 ($CR = 28.89$; $p < 0.001$), indicating that the observed data were not multivariate normal. Therefore, based on Mahalanobis distance or d -squared (Byrne, 2010) four cases were removed from initial dataset, in order to improve the multivariate kurtosis. This resulted in a final sample of 128 cases on which all subsequent analyses were performed.

As input data, the covariance matrix among the RAQIC items was used, since AMOS does not allow for use of the correlation matrix. Absolute values of covariances among items from RAQIC ranged from 0.01 to 3.89 ($M = 0.54$; median = 0.28).

Confirmatory factor analysis of the RAQIC

The model with one-latent factor showed a poor statistical fit to the observed data: $\chi^2 = 260.64$, $df = 54$, $p < 0.001$, $\chi^2/df = 4.45 (> 3)$, SRMR = 0.13, GFI = 0.78, AGFI = 0.69, NFI = 0.45, CFI = 0.50, RMSEA = 0.165 (C.I. 90%: 0.144-0.187). Values of standardized estimates (i.e., unique latent factor loadings) ranged from 0.03 to 0.73 ($M = 0.40$; median = 0.42), but for items 7, 8 and 9 the loadings were not statistically significant. The second model which included four latent-factors proved an acceptable fit: $\chi^2 = 93.98$, $df = 48$, $p < 0.001$, $\chi^2/df = 1.95$, SRMR = 0.08, GFI = 0.91, AGFI = 0.86, NFI = 0.86, CFI = 0.89, RMSEA = 0.085 (C.I. 90%: 0.060-0.113). In addition, all factor loadings (with standardized values ranging from 0.21 to 0.92; $M = 0.55$; median = 0.51) were statistically significant (for more details, see Table 1). Values of squared multiple correlation (R^2) were comprised between 0.045 and 0.853 ($M = 0.358$; median = 0.267). On average, the four latent-factors accounted for 35.8% of the variance in the items. Covariations among the four latent factors were as follows: 0.72 ($p < 0.001$) – internal locus of control with coping focused on problem-solving, 0.16 ($p > 0.05$) – internal locus of control with perceived social support, 0.35 ($p < 0.01$) – internal locus of control with self-efficacy, 0.006 ($p > 0.05$) – coping focused on problem-solving with perceived social support, 0.29 ($p < 0.01$) – coping focused on problem-solving with self-efficacy, and 0.009 ($p > 0.05$) – perceived social support with self-efficacy.

Table 1. Confirmatory factor analysis of RAQIC (final model with four-latent correlated factors) *****

| Number of item/observed variable | Hypothetical latent factor | Latent factor loadings (estimates) | | | |
|--|----------------------------|------------------------------------|------|------|---------|
| | | Unst. | SE | St. | CR |
| 1. I do my best I can in order to become a parent. | Internal locus of control | 0.52 | 0.11 | 0.51 | 4.59*** |
| 2. I consider that I can't do anything to | Internal locus of control | 0.6 | 0.19 | 0.29 | 3.09 |

***** Note: $N = 128$; Unst. = unstandardized, SE = standard error, St. = standardized, CR = critical ratio for differences from zero; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

| | | | | | |
|---|---------------------------|----------|------|------|-------------|
| solve my infertility problem. | | 1 | | | ** |
| 3. It depends on me to solve my infertility problem. | Internal locus of control | 1.0 0 | - | 0.46 | |
| 4. I rather think how to solve my fertility problem than how it affects me. | Coping (problem-solving) | 0.6 9 | 0.14 | 0.51 | 4.86 *** |
| 5 I'm looking for a positive meaning of my infertility problem. | Coping (problem-solving) | 0.3 5 | 0.16 | 0.21 | 2.13 * |
| 6. I can focus on solving my infertility problem in some way. | Coping (problem-solving) | 1.0 0 | - | 0.64 | |
| 7. I have friends that give me support related to my infertility problem. | Perceived social support | 1.0 9 | 0.16 | 0.92 | 6.64 *** |
| 8. I think that my family understand my problem and give me support. | Perceived social support | 0.3 6 | 0.07 | 0.43 | 4.82 *** |
| 9. I talk to my friends about the infertility issue. | Perceived social support | 1.0 0 | - | 0.84 | |
| 10. I believe that I am a strong person and that I will succeed in overcoming these difficult times. | Self-efficacy | 0.9 6 | 0.27 | 0.71 | 3.48 *** |
| 11. I believe that I succeed in accomplishing everything that I aim at, including my fertility problem. | Self-efficacy | 1.3 8 | 0.39 | 0.78 | 3.52 *** |
| 12. I am not convinced that I will become a parent as a result of all my efforts. | Self-efficacy | 1.0 0 | - | 0.35 | |

For the two measurement models which were tested, values of AIC were 288.64 (model with one-latent factor) and 153.98 (model with four-latent factors). This result suggests that model with four-latent factors would best describe the factor structure of RFQ.

Conclusions

Using data based on CFA technique, the present paper offers psychometric evidence for the factor structure of a short self-report questionnaire which was designed to capture four key factors associated with resilient individual functioning. Factor analysis revealed a well-differentiated four-factor model. Latent factors were confirmed as internal locus of control, problem-focused coping, perceived social support, and self-efficacy. The internal consistencies for all these dimensions were satisfactory. The RAQIC could be useful for researchers who aim to measure many variables in a short time.

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