Psychometric Properties of Adolescent Resilience Scale in Gifted Male and Female Iranian Students

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Abstract

Background: Resilience is the process of one's relatively positive adaptation to traumatic experiences. This study aimed to measure the psychometric parameters of the Persian version of the Adolescent Resilience Scale (ARS) among a group of gifted Iranian students.

Methods: In this cross-sectional study, 347 gifted adolescents (148 boys and 199 girls) in the academic year 2019-2020 filled out ARS. Confirmatory factor analysis (CFA) and multi-group confirmatory factor analysis (MGCFA) were employed to examine the factorial validity and the gender-based equivalence of the factorial structure of this scale, respectively. AMOS V24.0 was used to analyze the data.

Results: The results of CFA in AMOS showed that after establishing a covariance between error residuals for some pairs of items, the triple-factor version of ARS (consisting of novelty seeking, emotional regulation, and positive future orientation) was well fitted with the data in both groups of boys and girls (RMSEA=0.060). MGCFA results also revealed the inter-group invariance of the factorial structure, factor loading, error values, and inter-factorial variance and covariance of ARS among the gifted male and female students (P<0.001). The internal consistency coefficient was obtained to be 0.82 for novelty seeking, 0.73 for emotional regulation, and 0.70 for positive future orientation.

Conclusion: The study findings provided new empirical evidence on the factorial structure and measurement invariance of ARS. The Persian version of ARS was a valid and reliable tool to measure psychological resilience.

Keywords: Factor analysis, Statistical, Resilience, Gender characteristics, Students

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1. Introduction

An integral part of the dynamic process of human evolution is to confront bottlenecks, adverse situations, and crises. In today's modern societies, phenomena, such as war and bloodshed, poverty, looting, accidents and crimes, natural disasters, social insecurity, economic problems, and the increasing trend of various forms of social harm are among the most stressful and traumatic events that seriously threaten human beings and their physical and psychological survival in different parts of the world. Nevertheless, thinking about the serious issue of human life, survival, and maturity at different stages of development under these circumstances depends on a constructive confrontation with such negative events at different levels (1).

The interpretive capacities and action coordinates of the concept of psychological resilience in different age groups have been the focus of a large group of researchers in recent years. Resilience generally refers to the process, ability, and result of one's successful adaptation to challenging and threatening situations

(2, 3). In other words, resilience is the process of one's relatively positive adaptation to traumatic experiences. Singh and colleagues (4) stated that the concept of resilience implies the process of dealing with, managing, and adapting to the main sources of stress and trauma. According to Masten and Wright (5), resilience specifically refers to the processes of positive adaptation in the face of fundamental threats to life. The study of human resilience aims to understand individual differences in relation to traumatic experiences (6). Moreover, research efforts regarding the positive developments of adolescence in recent years have focused on enhancing the strengths rather than reducing the risk factors (7). The interpretability of resilience is one of the major conceptual examples of such a turn in the researchers' approach. As one of the most sensitive stages of human life, adolescence is associated with issues, such as learning, exploration, identity consolidation, and relationship development. Since dynamic brain development and the formation of cognitive and emotional models, which will probably continue into adulthood, occur in adolescence, this period of life plays an undeniable role in developing

resilience, consequently ensuring one's well-being and health throughout life (8). Patton other colleagues (9) stated that the benefits of contributing to positive adolescent development can be divided into three parts, including early benefits during adolescence, positive changes in adulthood, and finally benefits for future generations.

Under the same circumstances, some adolescents show relatively high levels of crisis and vulnerability to violence and crime (10). Risks, such as sexual, emotional, and physical violence, substance abuse, the onset of mental disorders, and participation in high-risk sexual behaviors, cause one to face harmful experiences, namely poverty and unemployment, racial and sexist discrimination, and bitter situations through other structural forms (11). Stressful and traumatic events in adolescence basically cause long-term consequences in adulthood. A wide range of empirical evidence suggests that there is a relationship between traumatic experiences during adolescence and various forms of devastating consequences in adulthood, such as mental health problems, suicide, low occupational health, drug abuse, neglect of medical care, antisocial behaviors, and violence against future generations (12, 13). In this regard, negative and destructive life situations, including parental psychological pathology, low socioeconomic status, and childhood abuse are of special importance. Accordingly, positive adaptation also points to the development of better and higher levels of activism following exposure to environmental hazards. It can be hence concluded that the central idea of psychological resilience is how to provide a healthy and safe platform for human development despite difficult circumstances (14).

Empirical evidence demonstrates that the developmental stage of adolescence with sudden changes in it in various areas confronts adolescents with a dense accumulation of developmental tasks and thus can optimally threaten their optimal behavior (15). Based on the available empirical evidence and the functional characteristics of psychological resilience during adolescence and other developmental periods, researchers need a reliable and valid tool to study the buffering effects of this construct for adolescents. Given the importance of resilience and the need to study the functional characteristics of this construct during adolescence, a summary of previous studies on the psychometric analysis of tools for measuring psychological resilience in adolescence is presented here.

The literature review indicates that the systematic analysis of psychometric properties of tools measuring psychological resilience among different age groups, particularly adolescents, has always been the focus of a large group of researchers (16, 17). Rosário Pinheiro and Matos (17) explored the construct validity of two versions of a resilience scale in a sample of Portuguese adolescents. The results of a varimax rotation supported the one-factor solution for each of the two versions of the resilience scale, including 23 and 13 items, respectively. In addition, the similarity coefficient of the two versions of the resilience scale, including 23 and 13 items, was equal to 0.92. Finally, positive correlations between resilience and the scores of the tendency to flourish individual potential and negative correlations between resilience and scores of anxiety and depression symptoms confirmed the concurrent validity of both versions.

Amirsardari and colleagues (18) analyzed the psychometric properties of the International Children and Youth Resilience Measurement (CYRM-28) Scale. The results of confirmatory factor analysis illustrated that the three-factor structure of this scale, including subscales of individual factors, relationship with the primary caregiver, and contextual factors, was well fitted with the data. The internal consistency coefficient for these three subscales was obtained to be 0.78, 0.80, and 0.77, respectively. In a study conducted by Cheraghi and coworkers (19) for psychometric analysis of the adolescent resilience scale, the factorial structure of this scale consisted of the following subscales: self-confidence, emotional awareness, negative cognition, social skills, empathy/tolerance, family relationship, family access, peer communication, peer access, academic supportive environment, academic communication, and communication with the community. The internal consistency confident for these subscales was equal to 0.70, 0.71, 0.71, 0.72, 0.72, 0.73, 0.83, 0.70, 0.70, 0.73, 0.72, and 0.70, respectively. Mu and Hu (20) conducted a study to validate the Chinese version of the Children and Youth. Resilience Measurement (CYRM-28) Scale. The analysis of principal components in the first step showed that the factorial structure of this scale consists of only one factor explaining 54.26% of the variance of the underlying factor. In the second step, Confirmatory factor analysis (CFA) results confirmed the factorial solution of the exploratory structure in the Chinese sample and the results demonstrated that the single-factorial structure was well fitted with the data. Moreover, the results of the gender-based equivalence of the factorial structure empirically supported the

similarity of the factorial structure of this scale in both sexes. Finally, the internal consistency of this scale was obtained to be 0.92. Baltaci and Karatas (21) assessed the validity and reliability of Adolescent Resilience Scale (ARS). The results of exploratory factor analysis (EFA) and CFA empirically supported the four-factor structure of this scale, including individual-centered resilience, family-centered resilience, peer-centered resilience, and school/teacher-centered resilience. In addition, the internal consistency coefficient for these four subscales was respectively obtained to be 0.75, 0.78, 0.72, and 0.73.

Since the moderating role of gender has always been emphasized by researchers interested in processual models containing the antecedents and consequences of psychological resilience in adolescents (3, 6), one of the future research priorities of the authors is to analyze the gender-based equivalence of the factorial structure of ARS. Bar-On and Maree (22) implied that one of the most important conceptual contexts defining the need to develop the emerging idea of emotional/social intelligence refers to the relationship between cognitive abilities of gifted individuals and the psychological quality of resilience. Their results showed that high levels of resilience were associated with a constructive confrontation of gifted learners with difficult situations of life. Ebersöhn and Maree (23) found that talented adolescents deal with threats from some negative realities of life, such as HIV or AIDS, by emphasizing the operational coordinates of some sources of psychological capital, such as enhanced self-regard, independence, stress tolerance, flexibility, and optimism. Although there are numerous sources of information about psychometric analysis of tools measuring psychological resilience in adolescents, there is an undeniable information gap regarding the psychometric analysis of ARS (24). As a result, considering the operational coordinates of resilience during adolescence and its buffering effects on reducing the consequences of exposure to stressful experiences in adolescents, this study aimed to analyze the factorial structure and gender-based equivalence of the adolescent resilience scale.

Methods

This was a cross-sectional study. The statistical population consisted of all the gifted male and female high school students in Ardabil, Iran in the academic year 2019-2020. The study sample included 347 male and female students selected based on the convenience sampling method. According to Kline (25), the sample should include five to 20 participants per the test item

in studies that aim to analyze the factorial structure of measurement tools. Therefore, it was decided to select 16 participants per item of ARS. However, considering a possible attrition rate of 5%, more students were selected to join the study. Weston and Gore (26) emphasized that, except for the level of complexity of the proposed model, increasing the sample size in structural equation modeling and CFA increases the sensitivity to the unit of quantitative measurement of goodness of fit and also increases to determine the fit of the assumed model with the observed data. Consequently, when there is a discrepancy between the number of items in a test and the sample size, the logic of judging the appropriateness of a given model regarding the goodness of fit is based on hyper-conservatism and the transition from open-minded judgments. The scale was filled with the participants' satisfaction and written informed consent was obtained from the participants in this study.

Instruments

Adolescent Resilience Scale (ARS): Oshio and colleagues in 2003 developed ARS to measure the psychological quality of adolescent resilience. This scale consists of 21 items that are scored based on a 7-point Likert scale (from 1: Not true at all to 7: Absolutely true). The three subscales of ARS are novelty seeking, emotional regulation, and positive future orientation (24). In the study conducted by Oshio and coworkers (24), the internal consistency coefficient for these three subscales and the whole scale was obtained to be 0.79, 0.77, 0.81, and 0.85, respectively. The similarity between the distribution patterns of the three subscales of ARS and the whole scale empirically supported the construct validity of ARS. Moreover, the internal consistency coefficient for these three subscales and the whole scale in this study was equal to 0.71, 0.75, 0.91, and 0.86, respectively.

The original version of this scale was translated into Persian. Afterwards, the Persian version was translated into English by another bilingual translator in order to maintain the linguistic and conceptual equivalence. The two translators discussed the semantic differences between the English and Persian version of ARS and tried to reduce the differences through the iterative review process. Finally, three faculty members assessed and confirmed the content validity and cultural relevance of the Persian version of ARS. The content validity index (CVI) and content validity ratio (CVR) of the Persian version of ARS were reported to be 0.84 and 0.87, respectively. To determine the face validity of the Persian version of ARS, this scale was provided to 15 experts and by removing the ambiguities of the

components of this scale, the 21-item form was approved (27). Khodaei and Seyed Ahmadi (28) reported an alpha Cronbach coefficient of 0.80 for the whole scale.

Data Analysis

Herein, data analysis was performed based on classical test theory. Each item was decided to be included in or excluded from the scale based on the results of factor analysis. In this study, the maximum likelihood estimation (MLE) in CFA was employed to estimate the model. In addition, as recommended by Meyers and colleagues (29), chi-square (χ^2) statistic, chi-square index on degree of freedom (χ^2/df), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA) were used to provide a comprehensive assessment of the model's goodness of fit. Consistent with the findings of Oshio and coworkers (24), the measurement model consisting of three subscales was selected and tested as the assumed and preferred model in this work.

Moreover, based on some empirical evidence, CFA was used to examine the measurement equivalence of ARS in the two groups of male and female adolescents. In cases where there is more than one group, it is necessary to perform multi-group confirmatory factor analysis (MGCFA) as a prerequisite to test the factorial structure invariance (24). MGCFA is an extended

form of the single-group factor analysis, in which the invariance of the estimated parameters of two nested models related to each group is tested. MGCFA can help us find an answer to the item of whether or not the components of a scale work the same at the desired operating levels (30). To perform MGCFA, certain parameters are assumed to be constant in the model to expose the model to some restrictions. In the current study, the sequence of restrictions proposed is as follows: invariance of factor loadings, error expressions, and variance-covariance equality between latent factors (31). Researchers usually apply different criteria to test the measurement invariance (32). Several researchers state that factor loadings are sufficient (33) whereas some others emphasize invariant measurement errors and variance-covariance equality between latent factors (34). In the present paper, CFA patterns were examined for covariance matrix, as an input, for both groups using the maximum likelihood method. Moreover, the hierarchal patterns of the equivalence or non-equivalence of factor loadings of the items and the equivalence or non-equivalence of inter-factorial correlation were tested for both groups.

In the present study, before data analysis via CFA, as proposed by Kline (25) and Bar-On and colleagues (22), the assumptions of univariate normality, multivariate normality and outliers, and missing data were tested and confirmed with the values of skewness and kurtosis (Table 1), the Mahalanobis distance, and an expectation-

Table 1: Mean, standard deviation (SD), skewness, and kurtosis of adolescent resilience scale (ARS) items

| Items	Mean±SD	Skewness	Kurtosis
1- I am looking for new challenges.	5.90±1.30	0.28	0.47
2- I like new things.	6.13±1.19	0.69	0.17
3- I think I have a lot of interest and curiosity.	5.89±1.34	0.42	0.91
4- I like to get to know everything.	5.74±1.44	0.14	0.90
5- I think difficulties are part of valuable life experiences.	5.44±0.59	0.98	0.34
6- I do not like to do things with which I am not familiar.	4.09±1.71	-0.08	-0.82
7- I think starting something new is always troublesome.	4.80±1.72	-0.45	-0.66
8- I think I can control my emotions.	5.09±1.61	-0.68	-0.24
9- I can stay calm in difficult situations.	5.32±1.59	-0.91	0.24
10- I try to be always calm and cool.	5.60±1.42	-0.93	0.51
11- I will continue what I start until the end.	5.54±1.44	-0.65	0.70
12- After a bad experience, it is difficult for me not to talk about it all the time.	3.97±1.82	0.11	-0.85
13- I cannot stand the problems and misfortunes.	4.40±1.85	-0.25	-0.93
14- My behaviors vary according to my every day.	3.57±1.79	0.39	-0.65
15- I quickly get bored and lose interest.	4.74±1.77	-0.43	-0.68
16- I have trouble controlling my anger.	4.67±1.94	-0.49	-0.88
17- I am sure that good things will happen in the future.	5.73±1.55	-0.33	0.19
18- I think I will have a bright future.	5.75±1.55	-0.33	0.21
19- I feel good about my future.	5.78±1.51	0.44	0.67
20- I have a clear goal for my future.	5.83±1.57	-0.47	0.59
21- I work hard to reach my goal.	5.64±1.55	-0.26	0.11

maximization (EM) algorithm, respectively. Moreover, the results of common distribution among the observed variables revealed that the assumptions of linearity and multicollinearity were established. Consistent with the findings of Oshio and colleagues (24), Nakaya and coworkers (35), and Oshio and colleagues (36), CFA was then performed to test the goodness of fit of the measurement tool, consisting of three subscales of novelty seeking, emotional regulation, and positive future orientation based on data obtained from a group of gifted adolescents. In other words, the tool for measuring the resilience of gifted adolescents was tested in this study using CFA in AMOS-18. The maximum likelihood method was also employed to estimate the measurement model.

Results

The participants included 148 male students, with a mean±standard deviation age of 14.82±1.24, and 199 female students, with a mean age of 15.11±1.43. Among the participants, 78 (22.5%), 74 (21.3%), 76 (21.9%), 68 (19.6%), and 51 (14.71%) students were from the seventh, eighth, ninth, tenth, and eleventh grades in high schools, respectively. Table 1 presents the mean, standard deviation (SD), skewness, and kurtosis of ARS items in gifted students.

Before exploratory factor analysis (EFA), the Kaiser-Meyer-Olkin measure of sampling adequacy index was calculated and equal to 0.86. Additionally, the results of Bartlett's test of sphericity were χ^2 (210N=347)=2947.28 (P <0.001). Scree plot graph of the EFA of ARS is depicted in Figure 1. These results indicated that the sample and correlation matrix were suitable for this analysis. On account of the correlation of the factors, the Oblimin rotation method was used. In other words, to determine the most suitable factors, by considering the scree plot, eigenvalue, and the proportion of variance explained (R^2) by each factor, the mentioned factors were extracted through principal component analysis (PCA) and Oblimin rotation (Table 2). Table 3 shows the results for factor loadings of the three-factor structure of ARS.

The results related to the goodness of fit indicators of ARS, consisting of the three subscales of novelty seeking, emotional regulation, and positive future orientation, illustrated that χ^2, χ^2/df, CFI, GFI, AGFI, and RMSEA were equal to 638.67, 3.43, 0.88, 0.87, 0.85, and 0.084, respectively (Figure 2). Based on the results, the quantitative unit of the goodness of fit shed light on the unacceptability of the proposed model of adolescent resilience scale with the collected data. Hypothetical models usually are not completely fitted with the data.
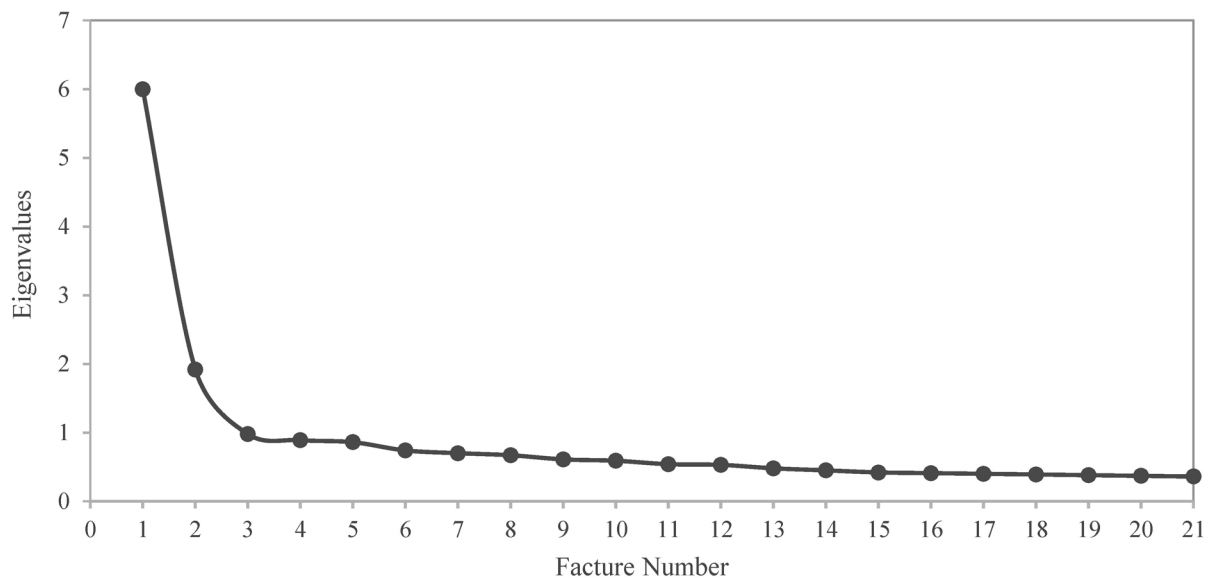

Figure 1: The figure shows the scree plot graph of the exploratory factor analysis of adolescent resilience scale.

Table 2: Statistical characteristics of adolescent resilience scale (ARS) via principal component analysis (PCA) for three-factor structure

Factors	Eigenvalue	Variance (%)	Compression ratio (%)
Emotional regulation	6.30	30.02	19.08
Positive future orientation	2.11	10.08	33.93
Novelty seeking	1.71	8.13	48.23

Table 3: Factor loadings for all the items of adolescent resilience scale (ARS)

Items	Emotional regulation	Positive future orientation	Novelty seeking
1	0.89	0.06	-0.03
2	0.88	0.09	-0.01
3	0.84	0.14	-0.12
4	0.82	0.13	0.04
5	0.66	0.06	0.13
6	0.44	-0.16	0.08
7	0.03	0.72	0.11
8	0.08	0.65	0.06
9	0.13	0.61	0.08
10	0.05	0.59	0.07
11	0.14	0.54	0.06
12	0.06	0.53	0.09
13	-0.03	0.45	0.12
14	0.04	0.43	0.26
15	0.16	0.29	0.80
16	0.12	0.11	0.79
17	0.04	0.08	0.70
18	0.05	0.02	0.58
19	0.09	-0.04	0.46
20	0.07	-0.05	0.42
21	0.08	0.07	0.40
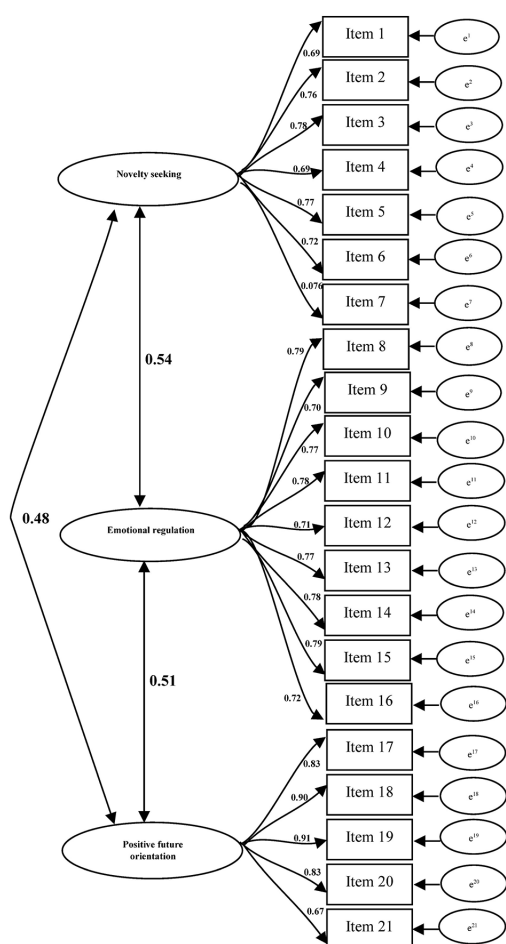
Figure 2: The figure shows the confirmatory analysis of the three-factor structure of the adolescent resilience scale before modification.
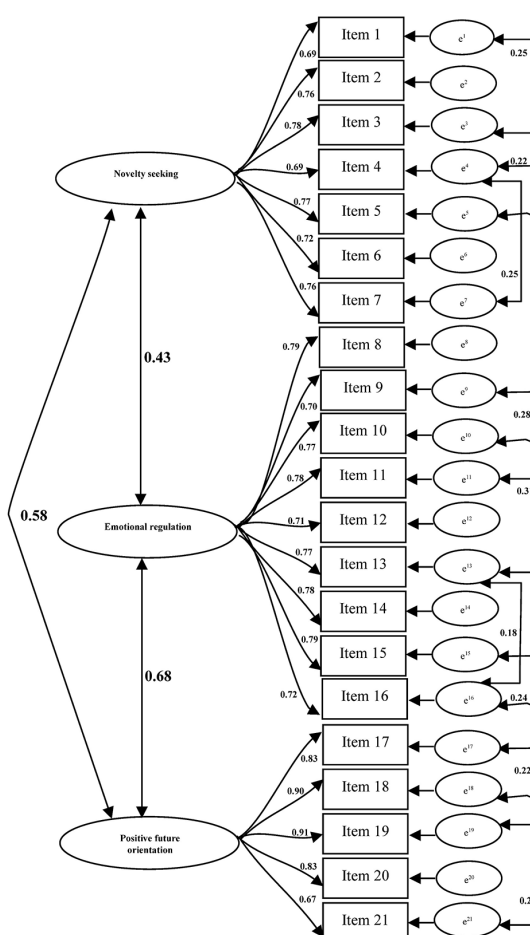
Figure 3: The figure shows the confirmatory analysis of the three-factor structure of the adolescent resilience scale after modification.

Therefore, the model's goodness of fit with the data was improved by correcting the model and creating several covariance paths between the residual errors of some pairs of the items. However, since a model modification step requires theoretical justification, the model proposed herein was corrected by creating covariance paths between the residual errors based on the theoretical considerations justifying the choice of model modification step (Figure 3). The results revealed that the model was corrected by creating covariance between the residual errors for items "1 and 3", "4 and 5", and "4 and 7" of "novelty seeking", items "9 and 10", "11 and 13", "13 and 15", and "15 and 16" of "emotional regulation", and items "17 and 18" and "19 and 21" of "positive future orientation". A total of nine units of reduction in degree of freedom and 202.48 units of reduction in chi-square was applied (Table 4).

Figures 2 and 3 exhibit the results of the regression weights of the three-factor structure of the adolescent resilience scale measurement model for gifted Iranian adolescents before and after modification of the proposed model. The results showed that the sum of regression was statistically significant for the three-factorial structure (P<0.001). As shown in Figure 3, the regression coefficient was obtained to be 0.69-0.78 for novelty seeking, 0.70-0.78 for emotional regulation, and 0.67-0.91 for positive future orientation. The common distribution pattern between the subscales of ARS, novelty seeking, emotional regulation, and positive future orientation, among gifted Iranian adolescents provided evidence supporting the three-factor structure of this scale. In this study, there was a positive and significant correlation between all the pairs of ARS subscales, including novelty seeking and emotional regulation (P<0.001, r=0.43), emotional regulation and positive future orientation (P<0.001, r=0.68), and novelty seeking and positive future

orientation (P<0.001, r=0.72).

Invariance Test

To test the gender-based equivalence of the factorial structure of ARS, the content was generally reported in two sections. The first section consisted of the results of formal invariance, metrics, and error or residual expressions of ARS and the second section included the results of structural invariance. In the first step, comprising a two-group fit, the pattern of factor analysis was estimated without inducing any restrictions to test the formal invariance. In this section, the optimal goodness of fit of the baseline model with data empirically supported the basic obligation or condition of formal invariance ($\chi^2_{(354)}$=669.52, P<0.001, CFI=0.94, GFI=0.94, RMSEA=0.051). In other words, the results showed that the theoretical structure specified for factor loadings was equivalent in both groups. The two groups were then compared in terms of metric invariance. To this end, the two groups were restricted by equalizing all the free factor loadings in one of MGCFA patterns. This pattern of MGCFA was well fitted with the data (Table 5). Table 5 represents the values of $\Delta\chi^2$, calculated to compare the restricted and non-restricted models in terms of χ^2. The results revealed that the factor loadings were the same in the two groups of male and female adolescents ($\Delta\chi^2$ (18) =25.30, P=0.52). Afterwards, the two groups were restricted by equalizing all the free error expressions. This pattern of MGCFA was well fitted with the data (Table 5). Table 5 demonstrates the values of $\Delta\chi^2$, calculated to compare the restricted and non-restricted models in terms of χ^2. The results showed that the error expressions were the same in the two groups of male and female adolescents ($\Delta\chi^2$ (21) =27.16, P=0.26). Lastly, the two groups were restricted by equalizing the factorial variances and covariances to test the structural equivalence of ARS. Based on Table

Table 4: Goodness-of-fit index values for the assessed TEI-ASF

Fit indicators	χ^2	df	(χ^2/df)	Goodness of Fit Index (GFI)	Adjusted Goodness of Fit Index (AGFI)	Comparative Fit Index (CFI)	Root Mean Square Error of Approximation (RMSEA)
Initial model	638.67	186	3.43	0.87	0.85	0.88	0.084
Modified model	436.19	177	2.46	0.94	0.90	0.94	0.060

Table 5: Results of multiple group confirmatory factor analysis (MGCFA) in the two groups of male and female adolescents

Pattern	$\Delta\chi^2$	Δdf	P
Pattern with constraints of factor loadings	25.30	18	0.52
Pattern with constraints of error expressions	27.16	21	0.26
Pattern with constraints of factorial variances/covariance	20.21	22	0.12

5, the factorial variances and covariances were the same in the two groups of male and female adolescents in restricted and non-restricted models ($\Delta\chi^2$ (22) =20.21, P=0.12).

Discussion

The present study aimed to measure the psychometric parameters of the Persian version of the Adolescent Resilience Scale (ARS) among a group of gifted Iranian students. Consistent with the findings of Oshio and colleagues (24), Nakaya and colleagues (35), and Oshio and coworkers (36), CFA results in this study empirically supported the goodness of fit of ARS, consisting of three subscales of novelty seeking, emotional regulation, and future positive orientation, in a sample of gifted male and female Iranian adolescents. The results of MGCFA also empirically supported the equivalence of factorial structure, factor loadings, error expressions, and factorial variances and covariances. It can be hence concluded that conceptualizing the pattern of prominent and non-prominent factor loads, the strength of the relationship between the items of each particular scale and its underlying structure, and the correlations between peer-to-peer factors were equivalent. Finally, the internal consistency coefficients of novelty seeking, emotional regulation, and positive future orientation indicated that ARS was acceptably reliable.

The study results regarding the inter-group validity of ARS among gifted male and female adolescents implied that the main underlying structure and theoretical causal mechanisms explain the model of managing emotional experiences, taking a stand against future events and innovative tendencies and based on the pursuit of novel experiences followed the same general principles in both groups. In other words, the study results indicated that the proposed model was structurally capable of describing and explaining the capacity and pattern of responding to peripheral stimuli in the context of coping with these experiences or the pattern of resistance to stress and even post-traumatic growth in both groups of male and female adolescents. However, despite the structural similarity in the qualitative model of capacity and response to challenging experiences, in line with the findings of studies by Zhang and coworkers (6), Connor and Davidson, (37), Namy and coworkers (3), Gartland and colleagues (38), and Stratta and other coworkers (39), it seems effective to conduct studies to make comparisons based on psychological resilience structure and its scales among different groups of adolescents with emphasis on the difference in the use of this psychological quality as a process, capacity, and outcome among gifted male and female adolescents.

Limitations

The study findings should be interpreted and generalized considering the research limitations. Primarily, self-reporting tools were used in this study instead of studying real behavior. It may encourage participants (especially adolescents) to apply methods based on gaining social approval and avoiding the notoriety of personal incompetence in answering items. In other words, behavioral observation and clinical indicators were not employed to confirm self-reporting scales. Second, since the study sample consisted of gifted girls and boys, the inter-group validity test of the adolescent resilience scale among gifted and non-gifted adolescents is recommended. Third, since this study was conducted based on a single measurement, it was not possible to test the stability of the scores of the Persian version of ARS. Fourth, in this work, the technical characteristics of the Persian version of ARS were tested based on the factorial validity of this scale. Therefore, the technical characteristics of the Persian version of ARS are recommended to be measured with an emphasis on other methods, such as predictive validity, divergent validity, and incremental validity.

Conclusions

The findings provided new empirical evidence on the factorial structure and measurement invariance of ARS. In other words, by emphasizing the invariance of the factorial structure of ARS among gifted male and female adolescents, the study results showed that the structural pattern of process, ability, and outcome of coping with challenging experiences in the two groups was qualitatively the same. This research can complete and expand the findings of the existing studies that examine the equivalence or non-equivalence of the structural pattern of process, ability, and outcome of coping with challenging experiences or the dynamic process of positive adaptation to bitter and unpleasant experiences among gifted female and male adolescents. Recent findings provided new empirical evidence on the factorial validity and psychometric characteristics of the Persian version of ARS among male and female gifted adolescents. Therefore, the study findings suggested that the Persian version of ARS is a valid and reliable multidimensional self-reporting tool in the field of psychology to measure the psychological resilience of male and female gifted adolescents.

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Ethical Approval

The study was approved by the Ethics Committee of Payame Noor University with the code of IR.PNU. REC. 63736. Written informed consent was obtained from the participants in this study.

Conflict of interest: None declared.

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