

Dysfunctional Attitude Scale: Evidence of Disconformity Factor Structure

Siavash Talepasand, PhD*
Department of Educational
Sciences & Development of
Handicapped children
Semnan University

Amir Rezaei, PhD
Department of Language & Literacy
University of Malaya

The Dysfunctional Attitude Scale (DAS) was designed to measure patterns of maladaptive thinking held by depressed individuals. Despite its wide use as a research and clinical tool, only a few studies have been carried out to examine its psychometric properties in a high school student population in Iran. The objective of this study was to validate the Iranian version of the Dysfunctional Attitudes Scale Form A in the context of Iranian students. A total of 522 Iranian students (275 females and 225 males) from high schools participated in the study and completed a Persian version of General Health Questionnaire (PGHQ) and a Persian version of Automatic Thought Questionnaire (PATQ). Exploratory factor analyses showed a four-factor model of dysfunctional attitude scale which contains perfectionism, social approval, dependency and autonomy. The fit of the proposed four-factor model was not promising. The internal consistency of the DAS (40 items) was reasonable (Cronbach's $\alpha = 0.72$). The DAS correlated significantly with the PGHQ ($r = 0.28$) and the PATQ ($r = 0.35$). The results of exploratory factor analyses fairly supported the four-factor framework with Iranian students; however, confirmatory factor analysis was not fit with the model. Implications are discussed in detail.

Keywords: dysfunctional attitudes scale, reliability, validity, factor structure

* Email: stalepasand@semnan.ac.ir

Cognitive approaches to emotional disorders are characterized by an emphasis on how individuals with particular difficulties represent and process their experiences. Beck (1987) proposed that dysfunctional attitudes (schemata) are vulnerability factors which play a causal role in the onset of depression. Beck, Rush, Shaw & Emery (1979) posit that individuals who are at risk for developing depression have acquired, as a result of negative childhood experiences, stable negative cognitive styles that include negative self-schemata (manifested as low self-esteem) and rigid, irrational beliefs (referred to as dysfunctional attitudes). Beck et al (1979) believed that negative cognitive styles are formed by initial experiences and create vulnerabilities to depression. These styles can be activated by specific situations. Hammen (1992) showed that this pattern has been investigated among adults and adolescents.

It seems that early adolescence is associated with significant increases in the prevalence of depressive symptomatology (Lewinsohn, Duncan, Stanton and Hautzinger, 1986). Lewinsohn, Rohde, Seeley & Hops (1991) reported that the lifetime prevalence of depressive disorders with 1710 adolescents was 20%. In Iran, Shojaezadeh and Rasafiani (2000) reported that the prevalence of depression with high school students was 43% in Kazeron. Monirpoor, Yazdandoost, Atefvahid, Delavar, and Khosfi (2004) reported prevalence of depression with high school students was 71% in Shahre'Ray. In general, these findings suggest that the rate of depressive symptomatology in high school students is very high. Since schemata are vulnerability factors which play a causal role in the onset of depression; it is necessary to have a valid instrument for augury of depression.

Schemata are most often operationalized as dysfunctional attitudes and are assessed with the Dysfunctional Attitudes Scale (DAS; Weissman, 1979; Weissman & Beck, 1978). The Dysfunctional Attitudes Scale (DAS; Weissman, 1980; Weissman & Beck, 1978) is a self-report instrument designed to assess attitudes that can predispose a person to depression. It was originally a 100-item scale developed using a college student population and has subsequently been refined into two parallel 40-item forms A and B. The DAS Form A (DAS-A) has been widely used in

depression research, particularly in testing the cognitive theory of depression (Whisman, 1993). Items such as 'If others dislike you, you cannot be happy', and 'If I fail partly, it is as bad as being a complete failure' were rated on a seven-point scale, ranging from totally agree (1) to totally disagree (7). Total scores can range from 40 to 280, with higher scores indicating greater endorsement of maladaptive beliefs.

The original English version of this scale was found to have satisfactory reliability coefficients and could discriminate significantly between depressed and non-depressed groups. Additional studies have further supported the adequacy of this scale in terms of internal consistency and validity among college students (Dobson & Breiter, 1983; Weissman, 1980; Weissman & Beck, 1978; Brown, Hamme, Craske, & Wickens, 1995; Cane, Olinger, Gotlib, & Kuiper, 1986; Fresco, Heimberg, Abramowitz and Bertram, 2006; Haefel, Abramson, Voelz, Metalsky, Halberstadt, Dykman, and et al., 2005; Sahin and Sahin, 1992; Hankin, Abramson, Miller and Haefel, 2004). Also, some researchers supported its adequacy in terms of internal consistency and validity among adolescents (Kauth & Zettle, 1990; Roberts & Gamble, 2001). In another study, D'Alessandro & Burton (2006) supported its adequacy among children. Another group of researchers tested and supported its consistency and validity among psychiatric population (Gotlib, 1984; Seligman, Schulman, DeRubeis, Hollon, 1999; Hamilton & Abramson, 1983; Ilardi & Craighead, 1999; Joiner, Metalsky, Lew, & Klocek, 1999 and Chioqueta and Stiles, 2004). In another study De Graaf, Roelofs, and Huibers (2009) supported the adequacy of this scale on general population.

The factor structure of the DAS has been reported with several factors in several studies. The factor structure of the DAS consisting of two factors (Imber, Pilkonis, Sotsky, Elkin, Watkins, Collins, & et al, 1990; Cane et al., 1986; Klocek, Oliver & Ross, 1997; Whisman & Fridman, 1998; and de Graaf, et al., 2009), three factors (Power, Katz, McGuffin, Lam, & Beck, 1994; Beck, Brown, Steer & Weissman, 1991), and four factors (Parker, Bradshaw, & Blinnault, 1984; Sahin & Sahin, 1992) have been reported. Now the question that rises here is that why there are different

results in different researches about the factor structure of DAS! It seems that there is one serious problem in the literature of DAS that is dividing many items of DAS in several factor analyses. For example, Imber et al. (1990) gained a two-factor solution with 26 items, Cane et al. (1986) reported a two-factor solution with 25 items, and Power et al. (1994) showed a three-factor solution with 24 items. Recently, De Graaf, et al. (2009) showed a two-factor solution with 17 items. In addition, the factors gained from several studies do not have mean unity. For example, when the results of De Graaf, et al. (2009) are compared with Imber et al. (1990), there is confusion that what the items 19, 27, 28, 32, 34 and 38 are measuring? Do they measure "Dependency" as claimed by de Graaf et al. (2009) or "need of approval" as claimed by Imber et al. (1990)? In general, it seems there is a problem in interpretation of DAS. No study showed all of the items of DAS to contribute to the validity of DAS. Now, the question that arises here is why no study showed all of the items of DAS to contribute to the validity of DAS? Perhaps, items were insufficient, or the construct was unclear or unrelated.

In Iran, no previous study has been reported examining the psychometric properties of an Iranian version of DAS on high school students. Therefore, the purpose of the present study is to investigate the reliability, validity and the factor structure of DAS in high school students. Since the current study is on the high school students, it is assumed that the structure model would be between two to four factors.

Method

Participants and Procedure

Participants in this study were 522 high school students from the Semnan city (275 females, 225 males). They were from sixth (35%), seventh (34.2%) and eight (30.8%) grades. The stratified sampling method was used to select the sample. At first, sampling proportion was calculated on the bases of different grades and genders. The proportions for grades of six to eight in females were .42, .29, and .29 and for males were .47, .27 and .26, respectively. In this regard, the number of students who were

recruited from grades sixth to eight in females were 113, 81, and 81 and in males 106, 61, and 58 respectively. Trained assistants administered all the instruments. They rechecked each of the questionnaires to make sure that all the items are answered. The scales were administered in groups and the time for the completion of all of the them was 55 minutes on the average.

Instruments

In addition to the DAS, participants completed several additional measures, two of which are relevant to this study: the ATQ-60 and the GHQ-28. The Automatic Thoughts Questionnaire (ATQ-60; Hollon & Kendall, 1980, Ingram & Wisnicki, 1988) is a 60-item self-report instrument that measures the frequency of occurrence of negative and positive automatic thoughts or self-statements. Each item represents a thought and respondents rate the frequency of occurrence of this thought, or a similar thought, within the past weeks. The Persian version of The Automatic Thoughts Questionnaire (PATQ-60) revised and validated by Talepasand (1996) has been used in this study. In the PATQ, occurrence frequency is rated on a 4-point scale¹ ranging from 1 (not at all) to 4 (all the time). Scores range from 60 to 240. Reliability and validity of the PATQ have been examined in numerous studies and are high enough (Talepasand, 1996). In this study, the internal consistency of the PATQ (60 items) was Cronbach's $\alpha = 0.94$.

The General Health Questionnaire 28 (GHQ-28) is a 28-item measure of emotional distress in medical settings, which is divided into four subscales: somatic symptoms (items 1–7); anxiety/insomnia (items 8–14); social dysfunction (items 15–21); and severe depression (items 22–28) (Goldberg, 1978). The total score can be used as a measure of psychological distress. Persian Version of The General Health Questionnaire (PGHQ-28) was used in this study. Taghavi (2001) reported test-retest, split half and Cronbach's alpha coefficients of 0.70, 0.93 and 0.90, respectively. In this study, the internal consistency of the PGHQ was determined for the four subscales:

¹ In the original version, 5-point scale ranging from 1 to 5 has been used.

somatic symptoms, anxiety/insomnia, social dysfunction and severe depression. These coefficients were .69, .70, .64 and .82, respectively. The total score was used as a measure of psychological distress.

The original English version was translated into Persian by the third author and back-translated by an independent translator. The back-translation was similar to the original English form.

Results

The means, standard deviations, and correlations among the various measures for the total sample are shown in Table 1.

Table 1
Means, standard deviations, and correlations among the various measures for the total sample of (n = 522)

variable	M	SD	PATQ	PGHQ	somatic symptoms	Anxiety /insomnia	social dysfunction	severe depression
DAS	156	20.6	0.35	0.28	0.19	0.23	0.20	0.20
PATQ	115.2	25.6		0.64	0.47	0.47	0.47	0.61
PGHQ	52.4	11.9			0.76	0.82	0.73	0.85
somatic symptoms	12.1	3.4				0.55	0.39	0.53
anxiety/insomnia	13.4	3.7					0.47	0.58
social dysfunction	14.3	3.4						0.49
severe depression	12.7	4.6						-

All correlations are significant at the 0.01 level.

Reliability

The analyses of the total sample ($n = 522$) yielded a Cronbach's alpha of 0.72. In general, reliability estimate was acceptable indicating reasonable internal consistency. All corrected item-total correlations ranged between $r = 0.03$ ("Happiness is more a matter of my attitude towards myself than the way other people feel about me" and " Being isolated from others is bound to lead to unhappiness") and $r = 0.49$ ("I cannot be happy unless most

people I know admire me"). These correlations were weak compared to moderate levels.

Convergent Validity

As evidence of the convergent validity, Pearson correlation coefficients were computed with a measure of Persian Version of the Automatic Thoughts Questionnaire (PATQ) and another measure of Persian Version of the General Health Questionnaire (PGHQ) on the total sample. The results are displayed in Table 1. All the correlations were positive and statistically significant.

Exploratory factor analyses

In keeping with the analyses reported in the literature, initially exploratory factor analyses of all the 40 items of DAS-A was conducted. It began with a principle axis factoring to assess the number of the factors in DAS-A. In this analysis 14 factors emerged with eigenvalues greater than 1.0. However, inspection of the scree plot suggested one large initial component (lambda 4.745, percentage of total variance explained 11.86%) followed by a series of smaller components (e.g., component 2 lambda 3.08, 7.7%; component 3 lambda 2.17, 5.4%; component 4 Lambda 1.62, 4.1%, etc.). Half of the DAS-A items loaded positively on the first unrotated principle factor (loaded more than 0.2). On the whole, the scree plot suggested that two-to four-factor solutions were reasonable. Thus, a series of iterative principle axis factor analyses were used to extract two-, three-, and four-factor solutions. Since, in all of the previous studies the Varimax orthogonal rotation has been used, we also used it to simplify the structure prior to the interpretation.

For the two-factor solution, most of the highest loading items on the first factor were from the original perfectionism scale, though only 8 of the 15 items from the perfectionism scale loaded more highly on factor one than factor two. Factor two was comprised eight of the original social approval items and 11 items that were originally on neither scale.

For the three-factor solution, factor one still emerged as a perfectionism factor, five of the original items (4 and 20-23) loaded more on social approval and three items (16, 29 and 36) loaded on perfectionism that did not emerge in prior studies. Factor two was closer to matching social approval in this solution, seven items (12, 18, 20, 21, 23, 25 and 31) loaded on social approval that did not appear in prior studies. Factor three emerged as an autonomy factor. The three highest loading items on this factor were autonomy items (24, 35 and 2).

The four-factor solution is shown in Table 2. In this solution, factor one emerged as perfectionism factor; most items loaded on this factor correctly. Three items (12, 29 and 36) loaded on perfectionism that did not load in prior studies. Factor two was closer to matching social approval in this solution, four of the original items (7, 19, 32 and 38) only loaded more on this factor, six items (5, 18, 31, 21, 20 and 33) loaded on social approval that were not so in prior studies. Factor three emerged as a dependency factor. The three highest loading items on this factor were dependency items (28, 27 and 40); the items 22, 23, 25 and 39 loaded on this factor that related with dependency. Factor four emerged as autonomy (self control) factor. The three highest loading items on this factor were autonomy items (24, 35 and 2) and items 34, 37, 30 and 6 were loaded on this factor. Item 17 loaded on this factor weakly.

To summarize, the exploratory factor analyses indicated that a two-factor, three-factor or four-factor solution would be acceptable. Although the four factor solution explained more variance [21% (four) versus 19% (three) and 15% (two)], neither solution explained much of the total variance in the sample.

Table2
DAS-A four-factor rotated solution with high school students

<i>Factor Loadings</i>				
<i>Item</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Das11	.697	.040	-.006	.040
Das10	.671	.088	.001	.018
Das13	.625	-.003	.025	.132
Das09	.564	.184	.024	.059
Das08	.528	.021	-.099	.106
Das26	.457	.140	-.085	-.170
Das16	.426	.126	.186	.169
Das36	.402	.108	-.255	-.020
Das29	-.394	-.202	.228	.037
Das15	.379	.095	.186	.095
Das14	.334	.162	.134	-.120
Das12	.321	-.267	-.059	.169
Das01	.248	.200	.137	-.070
Das19	-.035	.465	.111	.164
Das07	.343	.456	.162	.140
Das05	.180	.399	-.026	-.018
Das03	.224	.392	-.006	-.030
Das18	-.060	.388	.083	-.073
Das31	.092	.345	.125	.011
Das04	.238	.343	.195	-.103
Das21	.165	.314	.112	-.046
Das38	-.134	.297	.291	.223
Das20	-.081	.289	.281	-.113
Das32	.062	.237	.168	.099
Das33	.093	.209	.034	-.022
Das28	.033	.062	.452	.072
Das27	.066	.092	.436	.003
Das40	-.177	.013	.397	.388
Das23	-.029	.047	.345	-.023
Das22	.080	.161	.342	-.036
Das39	-.262	.119	.317	.079
Das25	-.044	.240	.306	-.012
Das17	-.112	-.090	-.162	.110
Das24	.133	.009	-.123	.568
Das35	-.016	.044	-.147	.492
Das02	-.065	-.050	-.070	.436
Das34	.097	.296	-.048	.333
Das37	.038	-.049	.094	.246
Das30	.022	-.036	.078	.169
Das06	.095	.063	.083	.152

Item analysis of the four- factor solution

We evaluated the internal consistency (coefficient alpha) and corrected item-to-total correlations for the perfectionism, social approval, dependency and autonomy scales as well as a total scores based on the items of these scales. Coefficient alpha for the 13 items on the perfectionism scale was 0.69. All the corrected item-total correlations were acceptable. All corrected item-total correlations ranged between $r = 0.19$ and $r = 0.58$, with the exception of item 29. Coefficient alpha for the 12 items on the social approval scale was 0.64, and all of the items had acceptable corrected item-to-total correlations. Coefficient alpha for the 7 items on the dependency scale was 0.57, and for the 8 items on the autonomy scale was 0.42. For all of the four factors, internal consistency was low. To assess the legitimacy of keeping these scales separate, the structure of the inter-item correlations was modeled using confirmatory factor analyses.

Confirmatory factor analyses

All CFA's were performed using LISREL 8.54 (Joreskog & Sorbom, 1993). Upon consideration of univariate and multivariate kurtosis, maximum likelihood estimation (ML) with adjustments for non-normality was employed. Three fit indices were used to assess model fit: the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the comparative fit index (CFI).

A four factor model was tested for explaining the pattern of correlations among the 40 items that make up the perfectionism, social approval, dependency, and autonomy scales. Both an independent and correlated four-factor model was tested. Finally, based on the results of these and other analyses, the scales were refined by eliminating some problematic items and re-evaluated the structure.

Table 3 presents the fit indices for a four factor model (initial structure).

Table 3
Fit statistics for the various hypothesized four – factor models from sample (N=522)

Model	χ^2	df	CFI	RMSEA	RMSEA 90% confidence interval	SRMR
Initial structure						
One-factor	4573.05	740	0.65	0.100	0.097-0.100	0.095
Two-factor	3324.57	739	0.71	0.082	0.079-0.085	0.089
Three-factor	2995.14	737	0.72	0.077	0.074-0.080	0.091
Four-factor						
Dependent factors	2577.48	696	0.56	0.072	0.069-0.075	0.083
Independent factors	2704.95	702	0.52	0.074	0.071-0.077	0.099
Revised Structure						
Four-factor						
Dependent factors	826.32	371	0.76	0.049	0.044-0.053	0.061
Independent factors	909.65	377	0.73	0.052	0.048-0.056	0.075
Abbreviated 19-item	267.23	149	0.90	0.039	0.031-0.047	0.053

The fit statistics did not suggest close fit. The DAS items were examined in order to diagnose possible reasons for misfit. An examination of the standardized covariance residuals from the four-factor model indicated that items 1, 3, 7, 12, 17, 20, 25, 29, 34, 38 and 40 were the problematic items. Thus, the scales were refined by eliminating problematic items and the structure was re-evaluated (revised structure).

Four correlated factors on the revised set of 29 items

On basis of several criteria, the four correlated factors model on this revised item set provided a significant improvement over the independent model. The chi-square for this independence model was 909.65 with 377 df. The Satorra - Bentler scaled chi-square for the four-correlated factor model was 826.32 with 371 df. The comparative fit index (CFI=0.76) was

not close to be marginally acceptable. The point estimate of RMSEA was below 0.049 and the upper confidence limit was 0.053 suggested by Browne & Cudeck (1993). The P-value for test of close fit was 0.73. The SRMR (0.061) was acceptable. However, the model was not fit; thus some items that were loaded on more than one factor were eliminated. For example, items 36, 16 and 26 from perfectionism; items 4, 21, 32, and 33 from social approval; item 39 from dependency and items 6 and 30 from autonomy were eliminated. The Satorra-Bentler scaled chi-square for the four-correlated factor model was 267.23 with 149 df. The comparative fit index (CFI=0.9) was close to marginally acceptable. The point estimate of RMSEA was below 0.031 and the upper confidence limit was the value 0.047. The P-value for test of close fit was 0.99. The SRMR (0.053) was acceptable. This model with a set of 19 items was not fit.

Figure 1 includes standardized path coefficients in the individual items by the factors for the 19 item DAS-A (see table 3). The findings indicated that the fit of the model was not supported; there were a number of items for which half of their variance was unexplained.

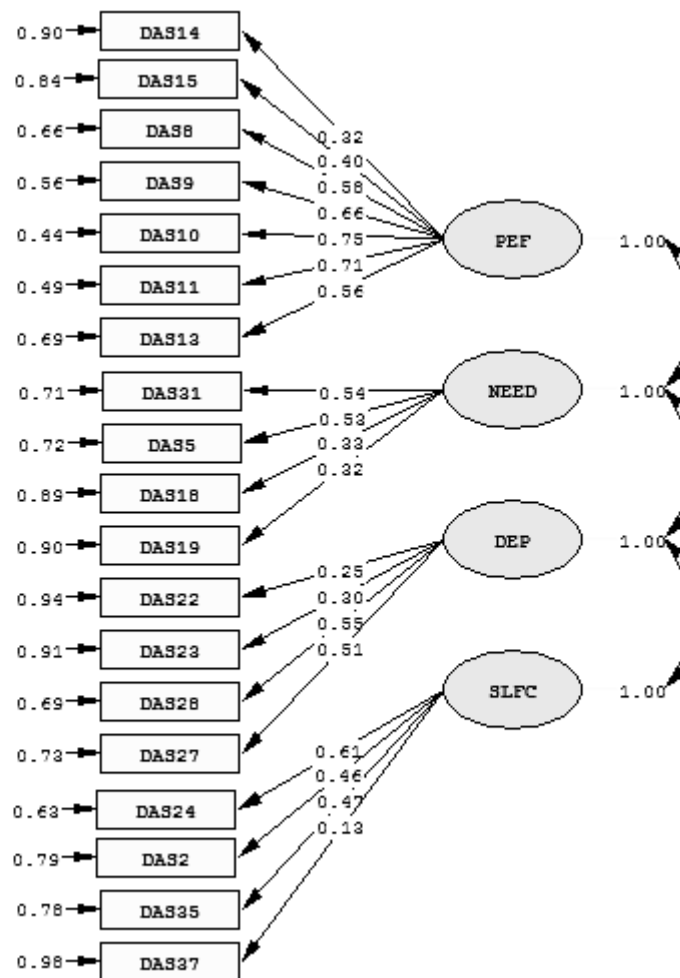


Figure1
Standardized Parameter Estimates DAS-A

Discussion

Overall, the results of this study fairly support the reliability, and convergent validity of the DAS-A. But, they don't support the construct validity of DAS. The DAS-A was fairly acceptable as an internally consistent. Convergent validity analyses indicated that the DAS-A was significantly correlated with both the PGHQ and PATQ. This demonstrates that the DAS-A is indeed measuring a trait that is associated with

automatic thoughts and general health in high school students. Exploratory factor analysis indicated that a four-factor solution is acceptable although two factors didn't show internal consistency. However, the factor structure of the DAS-A appears to be different with high school students. Confirmatory factor analysis showed that the original factors, even with some poor items deleted, do not match the latent structure in this sample. These findings are not consistent with results found by Imber et al, (1990), Cane et al., (1986), Klocke et al, (1997), Whisman & Fridman (1998), de Graaf, Roelofs and Huibers (2009), Power et al, (1994), Beck et al, (1991), Parker et al, (1984), Sahin & Sahin, (1992).

Another difference is the large amount of variance left unexplained by the factors in the sample consisting of high school student. With a sample of younger adults, Cane et al (1986) found that 61% of the variance was explained by a two-factor model, whereas; in our sample of students only 21% of the variance was explained even with a four-factor model. One explanation for this is that the DAS- A items are not tapping the latent variables, or perhaps the construct is unclear.

Another explanation is that there is more diversity amongst high school students than depressed younger adults and that dysfunctional thinking is prominent for only a subset of high school students.

Many items of DAS in previous research were removed. Now, here these questions arise: What is core problem of DAS? Was the construct of dysfunctional attitudes defined appropriately? Were items designed correctly? These are the questions that strike the mind by considering the result of the previous studies and the current results.

It is critical to identify and correctly interpret the meaning of the DAS-A factors in high school students. In order to be considered meaningful, the latent variables should be consistent with the theoretical basis of the instrument. In the case of younger adults, prior research using factor analysis has yielded two constructs (perfectionism and need for social approval) that are theoretically consistent with the experience of depression. Of course it should be noted that many items were deleted in the studies. These two factors also explain the majority of the variance,

suggesting that these are the dominant factors measured by the DAS- A in younger adults. Of course, in the student sample, the factor analyses didn't yield a factor model clearly. This suggests that the latent variables are different from perfectionism and social approval. Taken together, the data suggest that the DAS-A should not be used with high school students.

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