

Marta Mrozowicz-Wrońska

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A psychometric analysis of the Polish version of the Defense Style Questionnaire (DSQ-40) in a nonclinical sample of young adults

Analiza psychometryczna polskiej wersji Defense Style Questionnaire (DSQ-40) w nieklinicznej grupie młodych dorosłych

Institute of Psychology, Jagiellonian University, Krakow, Poland

Correspondence: Marta Mrozowicz-Wrońska, Department of Health Psychology, Institute of Psychology, Jagiellonian University, Ingardena 6, 30-060 Kraków, Poland,

tel.: +48 693 967 543, e-mail: m.mrozowicz@uj.edu.pl

Marta Mrozowicz-Wrońska, Zakład Psychologii Zdrowia, Instytut Psychologii, Uniwersytet Jagielloński, ul. Ingardena 6, 30-060 Kraków, tel.: +48 693 967 543, e-mail: m.mrozowicz@uj.edu.pl

Abstract

Aim of the study: The Polish version of the Defense Style Questionnaire (DSQ-40) is one of the tools used by Polish researchers for measuring the maturity of defense mechanisms. Its psychometric characteristics were assessed in the study. **Materials and methods:** An analysis of reliability and a principal components analysis were performed for the results of the Polish version of DSQ-40 in a nonclinical sample ($n = 341$) of young adults. **Results:** The Cronbach's alpha was slightly lower compared to the alpha for the original DSQ-40 questionnaire and exceeded 0.70 only for the immature factor. Calculating the alpha coefficient for each scale separately yielded diverse results: from alpha exceeding 0.80 for Autistic fantasy to a negative value for Devaluation. Very similar results were obtained by calculating the Spearman–Brown coefficient. Between items correlations for most of the scales were statistically significant but lower than $r = 0.50$. The correlation was high ($r = 0.70$) only for Autistic fantasy. The correlations for Devaluation, Denial and Splitting were statistically insignificant. Only for four out of 40 items, the item-factor correlation was higher than $r = 0.40$ while it did not exceed $r = 0.10$ in the case of five other items. The principal components analysis revealed a five-factor structure which explained 51.19% of the total variance. **Conclusions:** The Polish version of DSQ-40 offers an easy, practical way of measuring maturity of defense mechanisms, however, its reliability is problematic.

Keywords: DSQ-40, psychometrics, defense mechanisms

Streszczenie

Cel: Polska wersja kwestionariusza Defense Style Questionnaire (DSQ-40) jest stosowana jako narzędzie pomiaru dojrzałości mechanizmów obronnych w polskiej praktyce badawczej. Celem prezentowanych badań była analiza psychometryczna tego narzędzia, a przede wszystkim jego rzetelności. **Materiał i metoda:** Przeprowadzono analizę rzetelności i analizę czynnikową kwestionariusza DSQ-40 w nieklinicznej próbie młodych dorosłych ($n = 341$). **Wyniki:** Współczynnik alfa Cronbacha dla wszystkich trzech czynników był nieco niższy niż ten uzyskany w badaniach z użyciem oryginalnej wersji kwestionariusza i tylko w przypadku czynnika niedojrzałego jego wartość przekroczyła 0,70. Analiza rzetelności każdej skali z osobna ujawniła duże zróżnicowanie współczynnika alfa – od alfa większego niż 0,80 w przypadku Autystycznego fantazjowania do nawet negatywnych wartości dla Dewaluacji. Bardzo podobne rezultaty otrzymano, analizując współczynnik rzetelności Spearmana–Brown. Korelacje między pozycjami kwestionariusza w danej skali dla większości skal były niskie, tylko w przypadku Autystycznego fantazjowania korelacja była duża ($r = 0,70$); w przypadku Dewaluacji, Zaprzeczenia i Rozszczepienia korelacje były nieistotne statystycznie. Tylko cztery pozycje kwestionariusza korelowały z ogólnym wynikiem danego czynnika silniej niż $r = 0,40$, a dla pięciu pozycji korelacja była mniejsza niż $r = 0,10$. Analiza głównych składowych ujawniła pięcioczynnikową strukturę. Pięcioczynnikowy model wyjaśniał 51,19% wariancji. **Wnioski:** Polska wersja kwestionariusza DSQ-40 oferuje możliwość łatwego i szybkiego pomiaru dojrzałości mechanizmów obronnych, jednak jej rzetelność jest problematyczna.

Słowa kluczowe: DSQ-40, psychometria, mechanizmy obronne

INTRODUCTION

The identification of defense mechanisms is an important element of understanding human behavior, especially in clinical psychology and psychotherapy. Defense mechanisms are believed to protect us from excessive anxiety or self-esteem damage (see e.g.: Cramer, 2006; Vaillant, 1995). The 40-item Defense Style Questionnaire constructed by Andrews, Singh and Bond (1993) is one of commonly used self-report measures of defense mechanisms. DSQ-40 is based on the Defense Style Questionnaire created by Bond and collaborators in 1983 and consisting of 81 items (Bond et al., 1983), which was then revised into an 88-item version (Bond and Vaillant, 1986), modified into a 72-item variant (Andrews et al., 1989), and finally reduced to the current 40-item questionnaire. It is based on Vaillant's differentiation between mature, neurotic and immature

defense mechanisms (Vaillant, 1992, 1971). It consists of 40 questions to be answered using a 9-point scale. The items are attributed to 20 different defenses (2 items per each), clustered in three subscales. The defenses measured are: anticipation, humor, sublimation and suppression (mature factor); pseudo-altruism, idealization, reaction formation and undoing (neurotic factor); acting out, denial, devaluation, displacement, dissociation, autistic fantasy, isolation, passive aggression, projection, rationalization, somatization and splitting (immature factor).

In the Polish research, the version provided by a team led by A. Kokoszka (see Bogutyn et al., 1999) is often used and proves to be a useful tool. For example, Mirucka (2013) found a link between the results in the Polish version of DSQ-40 and the degree of disturbance in the body self in women with bulimia nervosa. Potoczek (2011) showed that the severity of panic and depressive symptoms in the

DSQ-40	Mean	SD	Mean in Andrews' et al. (1993) control sample (n = 388)	Coefficient alpha Polish version in the current studies (n = 341 young adults)	Coefficient alpha in Andrews et al. (1993) for Normal Subjects and Patients (n = 712)	Coefficient alpha in Ruuttu et al. (2006) for Normal Subjects and Patients (n = 410 adolescents)	Coefficient alpha in Bogutyn et al. (1999) (n = 387)
Mature Factor	5.44	1.15	5.76*	0.57	0.68	0.57	0.39
Sublimation	4.76	1.85	5.45*	0.29	0.42		
Humor	6.31	1.85	6.44	0.66	0.59		
Anticipation	5.68	1.63	5.72	0.25	0.32		
Suppression	5.01	1.87	5.50*	0.22	0.39		
Neurotic Factor	4.24	1.24	4.32	0.57	0.58	0.60	0.56
Undoing	3.88	2.03	4.26*	0.51	0.37		
Pseudo-altruism	5.24	1.70	5.14	0.24	0.19		
Idealization	4.03	2.13	3.64*	0.31	0.52		
Reaction formation	3.83	1.87	4.17*	0.30	0.32		
Immature Factor	4.35	0.86	3.54*	0.72	0.80	0.75	0.73
Projection	3.32	1.76	2.34*	0.52	0.64		
Passive aggression	3.56	1.70	3.20*	0.19	0.38		
Acting out	5.24	1.98	4.70*	0.61	0.49		
Isolation	4.74	2.32	4.08*	0.59	0.56		
Devaluation	3.84	1.54	3.06*	-0.11	-0.01		
Autistic fantasy	4.68	2.40	3.63*	0.83	0.89		
Denial	3.35	1.60	2.88*	0.10	0.10		
Displacement	4.23	1.95	3.48*	0.19	0.17		
Dissociation	3.96	1.75	2.85*	0.41	0.44		
Splitting	3.95	1.85	3.78	0.16	0.19		
Rationalization	6.14	1.42	5.57*	0.25	0.73		
Somatization	5.17	1.96	3.05*	0.56	0.56		

* Difference between the samples is significant at $p < 0.01$.

14 Tab. 1. Normative data, reliability coefficients for the DSQ-40 scales

difficult asthma group was related with a decrease in mature and increased neurotic and immature defenses. A correlation between the duration of experiencing symptoms of panic disorder, their severity and the tendency to use neurotic and immature instead of mature defenses was also found (Potoczek, 2010). The DSQ-40 seems to be a suitable tool to assess therapeutic change. Kokoszka et al. (2003) found a relationship between reduced neurotic symptoms and increased use of mature and decreased use of immature defenses after intensive psychodynamic group therapy. This version of the DSQ-40 is used to measure the maturity of defense mechanisms in Polish research. However, there are some reservations concerning its reliability. The authors of the original questionnaire (Andrews et al., 1993) reported moderate to high Cronbach's alpha coefficient for all three factors (mature factor $\alpha = 0.68$; neurotic factor $\alpha = 0.58$), but only the immature factor exceeded the 0.70 cut-off point ($\alpha = 0.80$). Still, some objections to using 0.70 as a proper cut-off point have been raised (e.g. Cortina, 1993; Lance et al., 2006). The authors of the Polish version of DSQ-40 (Bogutyn et al., 1999) report even lower Cronbach's alpha levels for the immature and mature factors ($\alpha = 0.73$ and $\alpha = 0.56$, respectively), and the Cronbach's alpha for the neurotic factor in their studies was below expectations ($\alpha = 0.39$). The three-factor structure of DSQ-40 was questioned as well. Ruuttu et al. (2006) found that a four-factor solution was better supported by the data obtained in a group of adolescents (psychiatric outpatients and a control, nonclinical sample). The aim of the current analysis of data collected in a non-clinical sample of young adults is to assess the psychometric properties of the Polish version of the DSQ-40. The data was obtained during a larger experiment on the cognitive basis of defense mechanisms.

MATERIAL AND METHODS

The Polish version of DSQ-40 was used as a part of a larger study. A total of 358 students of various disciplines (psychology excluded) participated in two experiments. They participated voluntarily (which they confirmed in writing) and were paid a small amount of money for their effort. The DSQ-40 was used at the beginning of the experimental procedure along with some other questionnaires. Seventeen participants were excluded from analysis as they failed to complete all the procedures in the experiment. The final sample consisted of 341 participants [204 females and 137 males with the mean age of 21.83 ($SD = 1.79$); two participants failed to provide information about their age]. The data was analyzed with SPSS 21.

RESULTS

First, normative data was calculated for each defense and factor and compared with the data obtained by Andrews et al. (1993) using one-sample *t*-test. There was a statistically significant difference in the immature and mature factors and in most of

Defense subscale	Item	Item-factor correlation	Correlation between items in the subscale	Spearman-Brown coefficient
Mature Factor				
Sublimation	3	0.18	0.17*	0.30
	38	0.16		
Humor	5	0.36	0.49*	0.66
	26	0.44		
Anticipation	30	0.30	0.15**	0.26
	35	0.25		
Suppression	2	0.23	0.12**	0.22
	25	0.31		
Neurotic Factor				
Undoing	32	0.29	0.34*	0.51
	40	0.45		
Pseudo-altruism	1	0.30	0.14**	0.25
	39	0.18		
Idealization	21	0.36	0.19*	0.31
	24	0.15		
Reaction formation	7	0.33	0.18*	0.30
	28	0.19		
Immature Factor				
Projection	6	0.35	0.36*	0.53
	29	0.36		
Passive aggression	23	0.22	0.11***	0.19
	36	0.48		
Acting out	11	0.19	0.44*	0.61
	20	0.28		
Isolation	34	0.32	0.42*	0.59
	37	0.32		
Devaluation	10	0.31	-0.05	-0.11
	13	0.21		
Autistic fantasy	14	0.51	0.70*	0.83
	17	0.39		
Denial	8	0.21	0.05	0.10
	18	0.04		
Displacement	31	0.35	0.11**	0.20
	33	0.18		
Dissociation	9	0.22	0.26*	0.41
	15	0.07		
Splitting	19	0.25	0.09	0.17
	22	0.09		
Rationalization	4	<0.01	0.15**	0.25
	16	0.10		
Somatization	12	0.38	0.39*	0.56
	27	0.34		

* $p < 0.01$. ** $p < 0.05$. *** $p = 0.052$.

Tab. 2. Item-factor correlation, between items correlation and the Spearman-Brown coefficient ($n = 341$ young adults)

the scales. The differences were statistically insignificant for the neurotic factor, as well as Humor, Anticipation, Pseudo-altruism and Splitting. The results are presented in Tab. 1.

The next step was to calculate the Cronbach's alpha coefficient for all three factors and each defense mechanism separately. The alpha coefficient for the mature factor was equal to that reported by Ruuttu et al. (2006), lower than in studies by Andrews et al. (1993) but higher than the one reported by Bogutyn et al. (1999) ($\alpha = 0.57$, $\alpha = 0.57$, $\alpha = 0.68$, $\alpha = 0.39$, respectively). The reliability in most of the scales was similar in the current study and in the study by Andrews; however, for Sublimation, Suppression, Idealization and Passive aggression the alpha coefficient was considerably lower ($\alpha = 0.29$ vs. $\alpha = 0.42$; $\alpha = 0.22$ vs.

$\alpha = 0.39$; $\alpha = 0.31$ vs. $\alpha = 0.52$; $\alpha = 0.19$ vs. $\alpha = 0.38$, respectively). The greatest difference between the current and Andrews' studies was noticed for Rationalization ($\alpha = 0.25$ vs. $\alpha = 0.73$). It is worth mentioning that in both studies the alpha coefficient for Devaluation was negative. The results along with those obtained by Andrews, Ruuttu and Bogutyn are presented in Tab. 1.

Since the alpha coefficient for a number of scales was below expectations, additional analyses were conducted. First, the item-factor and between items correlation for each defense were calculated. The highest item-factor correlation was observed for items 40 (Undoing), 36 (Passive aggression) and 14 (Autistic fantasy) ($r = 0.45$; $r = 0.48$; $r = 0.51$, respectively). Item-factor correlations for items: 18 (Denial), 15 (Dissociation), 22 (Splitting), 4 and 16 (Rationalization) were particularly low ($r = 0.04$; $r = 0.07$; $r = 0.09$; $r < 0.01$; $r = 0.10$, respectively). The correlations between items in each scale were lower than expected. The only scale with high correlation between items was Autistic fantasy ($r = 0.70$). In all other cases, the correlation was lower than $r = 0.50$. Insignificant correlations were found for Devaluation, Denial and Splitting. The most appropriate method for calculating the reliability for two-item scales is a matter of discussion. Eisinga et al. (2013) recommend the Spearman-Brown formula for estimating reliability in two-item measures. The Spearman-Brown coefficient had almost the same value as Cronbach's alpha and exceeded $p = 0.50$ only for seven out of twenty scales: Humor, Undoing, Projection, Acting out, Isolation, Autistic fantasy and Somatization ($p = 0.66$; $p = 0.51$; $p = 0.53$; $p = 0.61$; $p = 0.59$; $p = 0.83$; $p = 0.56$, respectively). The coefficients were below 0.20 for Passive aggression, Denial and Splitting ($p = 0.19$; $p = 0.10$; $p = 0.17$) and negative for Devaluation ($p = -0.11$). The results of calculating the item-factor correlation, between items correlation and the Spearman-Brown coefficient are presented in Tab. 2.

As Ruuttu et al. (2006) found, the three-factor model may not be best suited for DSQ-40. Two principal components analyses (PCA) were conducted. First, the varimax rotated PCA using three factors was performed in order to verify whether the model proposed by Andrews et al. (1993) fits the data. A three-factor model explained 37.53% of the total variance. The loadings in this solution arrange defenses differently than suggested by the authors of the original DSQ-40. The results are presented in Tab. 3.

In order to establish the best model for the obtained data the quartimax rotated PCA was performed and revealed a five-factor solution explaining 51.19% of total variance. The factors received working titles relating to the questionnaire items comprising them. The first factor – "Immature Defense Style" – consists of 6 defenses: Autistic fantasy, Isolation, Passive aggression, Devaluation, Projection, Displacement. "Defense Style Motivated by Social Approval" consists of Undoing, Reaction formation, Sublimation, Pseudo-altruism, Idealization. The third factor was termed "Reality Distorting Defense Style" and consists of Denial and Dissociation. Acting out, Splitting and Somatization are included in the

DSQ-40	Loadings		
	1	2	3
Mature Factor			
Sublimation	0.30	0.35	0.38
Humor		0.67	
Anticipation	0.37	0.42	0.24
Suppression	-0.16	0.66	-0.10
Neurotic Factor			
Undoing	0.58		0.33
Pseudo-altruism	0.34		0.51
Idealization	0.31	0.21	0.47
Reaction formation	0.32	0.24	0.29
Immature Factor			
Projection	0.62	-0.33	-0.15
Passive aggression	0.53		-0.45
Acting out	0.33	-0.26	
Isolation	0.38	0.16	-0.55
Devaluation	0.49		-0.40
Autistic fantasy	0.63	-0.13	-0.20
Denial		0.56	-0.36
Displacement	0.63		0.10
Dissociation	0.11	0.66	-0.18
Splitting	0.35		
Rationalization		0.42	
Somatization	0.50	-0.12	
% of variance explained	17.81	11.26	10.17
Cumulative %	17.81	28.50	37.53
* Loadings with absolute value lower than 0.10 were omitted.			

Tab. 3. Three-component solution of the varimax rotated PCA (n = 341 young adults)*

“Unreflective Defense Style.” The last strategy, which consists of Rationalization, Anticipation, Humor and Suppression, was named “Mature-Intellectual Defense Style.” The loadings of the five-factor solution are presented in Tab. 4, while Tab. 5 presents Cronbach’s alpha coefficients.

DISCUSSION

Unfortunately, the study confirmed that the reliability of the Polish version of DSQ-40 is questionable. At this point it is difficult to determine whether it is a matter of translation or inadequacy of the Polish version or a general problem with this tool. For the mature factor, the alpha coefficient was lower than in the study by Andrews et al. (1993) but equal to the alpha in the study by Ruuttu et al. (2006).

The differences in the alpha between the factors observed in all of the mentioned studies may be due to the unequal number of items comprising them. As Cortina (1993) notices, the fact that Cronbach’s alpha coefficient is a function of the number of items in a scale is often forgotten when interpreting its results. In the current study and the study by Andrews and Ruuttu, the highest alpha was found for the immature factor which consists of the highest number of items (24 items) compared to neurotic and mature factors (8 items each); therefore it seemed essential to pay more attention to the alpha coefficient for each scale separately. Such an analysis revealed that the reliability of the 20 scales is very diverse. For example, both the present study and Andrews et al. showed that the reliability of Autistic fantasy was higher than 0.80, while the alpha for Devaluation had a negative value. Very similar reliability levels were obtained in the current studies for the Spearman–Brown coefficient. These results suggest that the problem of reliability may be more substantial than just the unequal number of items in each factor. According to Andrews et al. (1993), each scale should measure a homogenous concept of one particular defense. However, the additional analysis in the present study revealed that between item correlations in a considerable number of scales were more than slightly below expectations. The item-factor correlations were low as well. It ought to be a matter of very careful deliberation how to interpret results of the questionnaire with scales which have insignificant negative between item correlations or items that correlate with the factor below $r = 0.10$.

The authors of the original DSQ-40 claim that the defenses measured in this questionnaire should be clustered into three factors (Andrews et al., 1993). The principal components analysis in the current sample of young adults did not support the assumption of a three-component structure. Instead, a five-component solution seemed to better fit the data and grouped the scales in a logical way. One of the isolated factors partially corresponds with the mature style from the original questionnaire, but contains rationalization, which was included in the immature factors by the authors of DSQ-40. All defenses in that factor need some intellectual effort. The second factor consists of defenses from

	Loadings				
	1	2	3	4	5
Immature Defense Style					
Autistic fantasy	0.68	0.18	−0.18		
Isolation	0.65		0.25	−0.23	
Passive aggression	0.65		0.14	0.24	
Devaluation	0.63		0.16		
Projection	0.59	0.17	−0.15	0.26	−0.24
Displacement	0.46	0.45	−0.12	0.10	
Defense Style Motivated by Social Approval					
Undoing	0.27	0.64			
Reaction formation	0.13	0.63	0.11	−0.35	
Sublimation		0.58	0.18		0.13
Pseudo-altruism		0.56	−0.26		0.17
Idealization	−0.16	0.54	0.18	0.39	
Reality Distorting Defense Style					
Denial	0.11		0.82		
Dissociation			0.70		0.26
Unreflective Defense Style					
Acting Out	0.13		−0.12	0.74	
Splitting		0.18	0.24	0.64	
Somatization	0.42		−0.20	0.44	0.24
Mature-Intellectual Defense Style					
Rationalization				0.15	0.70
Anticipation	0.17	0.37			0.62
Humor			0.35	−0.17	0.60
Suppression			0.41	−0.28	0.48
% of variance explained	16.22	12.28	9.02	7.65	6.01
Cumulative %	16.22	28.50	37.53	45.18	51.19
* Loadings with absolute value lower than 0.10 were omitted.					

Tab. 4. Five-component solution of the quartimax rotated PCA of the DSQ-40 (n = 341 young adults)*

	Number of items	Coefficient alpha
Immature Defense Style	12	0.74
Defense Style Motivated by Social Approval	10	0.62
Reality Distorting Defense Style	4	0.55
Unreflective Defense Style	6	0.58
Mature-Intellectual Defense Style	8	0.61

Tab. 5. Cronbach coefficient alpha for five factors extracted in the varimax rotated PCA of the DSQ-40 (n = 341 young adults)

the original neurotic style, but with sublimation added. It seems that what links these defenses is the need for social approval. The defenses from the original immature factor (apart from rationalization) were divided into three factors. One of them consists of denial and dissociation, which may be considered as reality distorting. Acting out, splitting and somatization, which cluster to form another factor, may be described as unreflective. The last factor is composed of six immature defense mechanisms. At this point, it is difficult to determine whether the five-component structure should be credited to the Polish version.

CONCLUSIONS

A quick, practical, self-reported measurement of the defense style is ambitious and invaluable for psychological research. The DSQ-40 proved its usefulness in measuring how people deal with stressful situations. However, there are reasonable reservations considering the psychometric features of DSQ-40 and the current study shows that they also apply to the Polish version.

Conflict of interest

The author declare no potential conflict of interest with respect to the research, authorship or publication of this article.

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