

Assessing Defense Styles: Factor Structure and Psychometric Properties of the New Defense Style Questionnaire 60 (DSQ-60)

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ABSTRACT

The Defense Style Questionnaire (DSQ) has undergone numerous revisions in an effort to improve reliability and validity. More recently, another version, the DSQ-60, was designed to be congruent with the DSM-IV. The present study examined the underlying structure of the DSQ-60 using both exploratory and confirmatory factor analytic procedures. The scale was administered to a group of students attending an English-speaking university (n= 305) and a French-speaking university (n= 212). Three factors (image distorting, affect regulating, and adaptive) accounted for 47.93% of the variance. Confirmatory factor analysis corroborated a three factor model. A new factor reflecting defensive functioning in healthy individuals was found. Cronbach's alpha for the three styles was .64, .72, and .61, respectively. Results are compared with prior research on the DSQ and suggest that the psychometric properties of the scale remain to be improved before broad use is warranted.

Keywords: defense mechanisms, rating scales, coping, DSQ, Defense Style Questionn.

RESUMEN

El Cuestionario de Estilos de Defensa (DSQ) ha experimentado numerosas revisiones y esfuerzos para mejorar su fiabilidad y su validez. Recientemente, se diseñó otra versión, el DSQ-60, para hacerlo congruente con el DSM-IV. El presente estudio examina la estructura subyacente del DSQ-60 mediante procedimientos de análisis factorial exploratorio y confirmatorio. El cuestionario se administró a un grupo de estudiantes universitarios de lengua inglesa (n= 305) y a otro de lengua francesa (n= 212). Tres factores explicaron el 47,93% de varianza (distorsión de la imagen, regulación del afecto y adaptación), modelo de tres factores que fue corroborado por el análisis factorial confirmatorio, aunque se encontró un nuevo factor que refleja el funcionamiento defensivo en individuos sanos. El alfa de Cronbach para los tres estilos fue de .64, .72 y .61, respectivamente. Los resultados se comparan con la investigación previa sobre el DSQ y se sugiere que las propiedades psicométricas de la escala deben ser mejoradas antes de su uso a gran escala.

Palabras clave: mecanismos de defensa, escalas de puntuación, coping, DSQ, Cuestionario de Estilos de Defensa.

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Defense mechanisms have received considerable attention over the past century. Research has shown that defenses can be associated with Axis I and II psychopathology (e.g., Blais *et al.*, 1996; Maffei *et al.*, 1995; Sammallahti & Aalberg, 1995; Watson, 2002) and psychological adjustment and physical health (e.g., Vaillant & Vaillant, 1990). Psychotherapy process and outcome research has further demonstrated that maladaptive defenses are associated with a weakened therapeutic alliance (for an excellent review, see Bond, 2004). The present day importance of defense mechanisms has been affirmed by their inclusion in the Diagnostic and Statistical Manual of Mental Disorders (DSM). In 1994 the Defensive Functioning Scale (DFS) was included in the DSM-IV as an axis for further study. The DFS contains 27 specific defenses and allows for ranking of one of seven levels of defensive functioning (APA, 1994). A number of studies have shown the reliability, validity (including incremental validity in relation to the other axes), and clinical utility of this axis (e.g., Perry *et al.*, 1998; Perry & Hoglend, 1998).

By virtue of the complexity of defenses, the methods developed to assess defense mechanisms have been presented with significant challenges in the domains of reliability and validity (Endler & Parker, 1996). This is particularly true of self-report methods. Self-report formats offer a level of quantification, portability, and affordability yet unattainable in other methods of defense measurement. However, defense mechanisms are largely unconscious processes (Vaillant, 1994), and thus are not obviously amenable to measurement via self-report questionnaires. Nonetheless, people are capable of reporting on defense use because they are aware of their typical behaviours when faced with stress (Bond, 1986) even if they lack insight into the defensive function of that behaviour (Plutchik, Kellerman, & Conte, 1979). Translated and validated in numerous languages (e.g., Chinese, Dutch, Egyptian Arabic, Finnish, French, German, Italian, Norwegian; see Bond, 2000), the Defense Style Questionnaire (DSQ) is without doubt the most widely used self-report instrument for defense measurement (Bond, 2004). Originally developed by Bond and colleagues (Bond, 1983, 1989), it was designed to operationalize and assess conscious derivatives of defenses. In 2000, the method was included in the American Psychiatric Association's Handbook of Psychiatric Measures (APA, 2000).

The DSQ has undergone numerous revisions in an effort to increase reliability and validity (e.g. Andrews *et al.*, 1989, 1993; Bond *et al.*, 1989; Trijsburg *et al.*, 2000). By and large, in the early research on the DSQ (e.g., Andrews *et al.*, 1989; Bond *et al.*, 1983, 1989; Vaillant *et al.*, 1986), methods used to develop the scale were insufficient. Item selection procedures were ambiguous, and defenses tended to be represented by variable numbers of items (e.g., one to nine, Bond *et al.*, 1989). Samples were often inadequate in size to warrant the use of factor analysis and the rationales for retention of items/defenses on factors were typically not reported. Notably, common guidelines for item retention were largely ignored (e.g., omitting defenses which had high sideloadings, choosing factors based on eigenvalues/scree plots, revising scales with poor internal consistency). For example, the statements in the DSQ-81 (Bond *et al.*, 1983) were selected by clinicians and item-to-total correlations to reflect 24 defense mechanisms (each measured by one to six questions). Factor analysis was conducted on a group of 111 non patients and 98 patients. Four defense styles, or groupings of defenses were uncovered: maladaptive action patterns, image distorting, self-sacrificing,

and adaptive. Fourteen (Perry *et al.*, 1998) of the 24 defenses loaded satisfactorily on these styles (range .54-.78), with two to six defenses comprising each style. The reasons the specific defenses were included on the styles are unclear in light of high sideloadings and differential cutoffs for each factor. Variance estimates were not provided.

Outlining inadequacies in the preceding versions of the DSQ (e.g., items which measured symptoms versus defenses, unequal representation of items per defense), Andrews and colleagues (1993) created a 40-item version from the 81 and 88-item scales (Bond *et al.*, 1989). Using a sample of 712 participants, item-to-defense and item-to-factor correlations, face, discriminant, and test-retest validity (amongst a host of other procedures) were examined to select appropriate items. The resultant scale had two items representing each of the 20 defense mechanisms. Factor analysis unveiled three defense styles, with individual items on the mature style loading from .47-.59, .33-.55 on the neurotic, and .32-.60 on the immature. Although this scale showed significant improvements over its predecessors, there remained a number of areas amenable to improvement.

Trijsburg and colleagues (2000) noted the need for enhanced content validation, and improved discriminant validity of the DSQ-40. They suggested a different approach to scale analysis (multidimensional scaling) in addition to a new scoring procedure. To test their assertions, the authors modified the DSQ-40 into the DSQ-42, a Dutch instrument. A large sample ($n=279$) of experts judged the content validity (e.g., defensive maturity, item-defense matching) and the instrument was administered to psychiatric outpatients, medical students, and graduate students enrolled in counselling. Unlike in previous studies, results revealed that a three factor maturity solution could not be derived. The authors suggested that use of the DSQ be limited to calculating an overall defensive functioning score.

The DSQ-60 was created (Trijsburg, Bond, & Drapeau, 2003) to make its defenses and their operationalization congruent with the DSM-IV (APA, 1994). Items from the DSQ-88 (Bond *et al.*, 1989), DSQ-40 (Andrews *et al.*, 1993), and DSQ-42 (Trijsburg *et al.*, 2000) were examined and the authors refined and formulated new items for any DSM-IV defenses which were missing. Face validity was assessed using a sample of Dutch psychoanalysts and psychoanalytically trained therapists ($n=155$) (Trijsburg, Bond, Drapeau, Thygesen *et al.*, 2003). Items were matched with defense titles and adaptiveness ratings were provided. On average, 72% of the items were correctly allocated to the defenses (range 12% to 99%). Items which failed to be allocated adequately were revised and assessed by the authors. Trijsburg and colleagues (2003) also showed that an overall defensive functioning (ODF) score could successfully discriminate psychiatric patients from Undergraduate students. Further, defenses were allocated to the seven DSM-IV defensive functioning levels (APA, 1994), and the mean scores of the levels were significantly dissimilar between the two groups. These results provide preliminary support for the validity of the DSQ-60. However, no study has examined the psychometric properties of the scale. The purpose of the present study was to determine if the newly developed DSQ-60 truly improves upon the important limitations of the previous versions of the scale, using both exploratory and confirmatory factor analytic procedures.

METHOD

Participants

The data were collected from two independent samples. For sample 1, participants ($n= 322$) were recruited from a large English speaking university (ESU) in Montreal, Quebec, Canada between June 2004 and December 2004. Undergraduate students were verbally solicited from classes. Thirty-three percent (33%) were majors in Education, and 13% were majors in Psychology, with the remainder widely dispersed throughout departments. No compensation was provided and participation was completely voluntary and confidential. The informed consent form, the DSQ-60, and a demographics questionnaire were handed out to all class members. There is no data available regarding the number of refusals, or the characteristics of the non-responders due to the anonymous nature of recruitment. Two participants were excluded due to incomplete data. The final sample ($n= 305$) included 247 females (81%) and 58 males (19%). The mean age of participants was 23 years ($SD= 6.57$). Close to 90% of the participants were single.

The second dataset was obtained from a French speaking university (FSU) in Montreal, Quebec. Participants were recruited from an Undergraduate class in the fall of 2003 and winter of 2005. The students were not compensated and their participation was confidential and voluntary. Multiple questionnaires (e.g., the French DSQ-60, measures of alexithymia, coping, etc.) were completed during the participants' free time (e.g., outside of the classroom) and were returned at their convenience. Data regarding non responders is not available. Two hundred and seventeen ($n= 217$) participants completed the French version of the DSQ 60. Five participants were excluded due to incomplete data. The sample used for analysis had 212 individuals, including 135 females (64%), 33 males (16%). Gender was not reported for 44 (21%) individuals. The mean age of participants was 21 years ($SD= 3.69$). No other demographic variables were available from the FSU dataset.

There were no differences in age between the ESU and FSU samples, $t(520)= 1.93$, *n.s.* Gender distribution was equal in both samples, $\chi^2= .02$, *n.s.*

Measures and instruments

The DSQ-60 is derived from previous versions of the instrument (e.g., Andrews *et al.*, 1989; Bond *et al.*, 1983; Trijsburg *et al.*, 2000). The scale is purported to measure the conscious derivatives of 30 defense mechanisms, with two items per defense. The defense mechanisms assessed include: acting-out, affiliation, altruism, anticipation, denial, devaluation of self, devaluation of other, displacement, dissociation, fantasy, help-rejecting complaining, humor, idealization, intellectualization, isolation, omnipotence, passive-aggressive, projection, projective identification, rationalization, reaction formation, repression, self-assertion, self-observation, splitting of self, splitting of other, sublimation, suppression, undoing, and withdrawal. Respondents answer each of the 60 items on a 9 point Likert scale with anchors of one (not at all applicable to me) and nine (completely applicable to me). Scores for each defense are calculated by taking the mean of the two

items representing the defense. Style scores are derived by taking the mean of the items belonging to each factor scale. Preliminary psychometric properties of the scale have been reported elsewhere (e.g., Trijsburg *et al.*, 2003, 2005; Thygesen *et al.*, 2005).

RESULTS

Principal components analysis with Varimax rotation was conducted on the ESU sample ($n = 305$) using the mean scores for each defense. The goal was to see how the 30 individual defenses loaded onto factors, commonly referred to as defense styles in the DSQ literature (Bond, 2000, 2004). Examination of the scree plot, scree elbow curves, and eigenvalues above 2 indicated that a three factor solution was the most parsimonious. The three rotated components accounted for 12.48, 24.49, and 9.96 percent of the variance (total = 47.93%), with Eigen values of 3.74, 3.60, and 2.99 respectively. Table 1 displays the rotated factor loadings and side loadings. As a general rule, loadings

Table 1. Exploratory factor analysis on the ESU sample ($n = 305$).

Defense ($n = 30$)	Factor 1	Factor 2	Factor 3
Displacement	.61	.04	.02
Undoing	.61	.07	.25
Acting out	.60	.19	.08
Passive aggression	.55	.20	-.21
Help rejecting/complaining	.54	.22	-.22
Projective Identification	.53	.07	.12
Splitting other	.50	.27	-.17
Projection	.47	.32	-.18
Splitting self	.45	.33	-.02
Idealization	.40	-.05	.18
Isolation	.07	.74	-.00
Dissociation	.25	.60	.10
Affiliation	.42	-.55	.23
Intellectualization	.22	.51	.11
Suppression	-.35	.48	.33
Devaluation self	.31	.48	-.14
Fantasy	.43	.48	-.25
Devaluation other	.27	.43	.12
Denial	.26	.41	.21
Withdrawal	.04	.40	-.09
Repression	.16	.35	.12
Rationalization	-.04	.01	.61
Humor	-.11	.27	.55
Anticipation	.17	-.08	.54
Self assertion	-.05	-.19	.54
Omnipotence	.07	.37	.54
Sublimation	-.08	.21	.48
Altruism	.15	-.08	.47
Self observation	-.08	-.23	.46
Reaction formation	.01	.16	.42

above .30 and variance estimates above 50% are consequential. Examination of the three factors revealed that some defenses would need to be deleted; some failed to make theoretical sense in their groupings, while others loaded poorly, or had high sideloadings. Confirmatory factor analysis was conducted to further determine the strongest items of the scale and make recommendations for refinement.

Confirmatory factor analysis

The fit statistics for all revisions described below can be found in Table 2. The model derived from the exploratory factor analysis (referred to as model 1 in Table 2) was applied to the FSU sample ($n=212$) to test its robustness and improve its properties. Defenses with factor loadings less than .45 in the exploratory analysis were dropped ($n=7$: idealization, devaluation of other, denial, withdrawal, repression, reaction formation, and affiliation). In refining that model, three defenses (suppression, rationalization, and omnipotence) were dropped due to their standardized regression weights (-.001, .15, and .19, respectively; see Model Two). The defenses of displacement, devaluation of

Table 2. Goodness of Fit Indices for AMOS models in the FSU sample ($n=212$).

Model	χ^2 / df^a	GFI ^b	IFI ^c	CFI ^d
1	2.65	.79	.67	.67
2	2.50	.82	.75	.75
3	2.65	.85	.77	.76
4	2.93	.85	.77	.76
5	2.92	.87	.79	.79
5 ESU ($n=305$)	2.77	.91	.79	.79

^a χ^2 adjusted for degrees of freedom; ^bGoodness-of-fit index;

^cIncremental fit index; ^dComparative fit index.

Table 3. Standardized regression weights in the FSU ($n=212$) and ESU ($n=305$) samples (each column contains standardized regression weights in the FSU and ESU samples respectively).

Defense ($n=14$)	Factor 1		Factor 2		Factor 3	
	Image-distorting		Affect regulating		Adaptive	
Projection	.57	.61				
Splitting self	.51	.49				
Splitting other	.48	.47				
Help rejecting complaining	.48	.50				
Projective identification	.48	.53				
Isolation			.71	.63		
Intellectualization			.70	.55		
Fantasy			.70	.64		
Dissociation			.59	.55		
Self observation					.68	.49
Self assertion					.63	.50
Anticipation					.59	.48
Sublimation					.48	.38
Humor					.43	.40

self, and undoing were dropped from model three for theoretical reasons. Similarly, acting out and passive aggression were omitted in model four based on theory. Altruism was dropped in the fifth model due to its regression weight in model four (.34). Fantasy was retained despite high sideloadings for theoretical reasons, leaving the final model with 14 defenses and 28 items.

We examined the goodness of fit index (GFI), the incremental fit index (IFI), and the comparative fit index (CFI) (see Table 2). The fifth model proved to be the best fitting for a combination of empirical and theoretical reasons: $\chi^2/df = 2.92$; GFI= .87; IFI= .79; CFI= .79. Although the χ^2/df increased from the first to fifth models (2.48 to 2.92), the value was still under three, which is considered acceptable. Further, the values for the CFI, IFI, and GFI were closest to one in this last model, indicating the most robustness. Comparable fit statistics were found in the ESU sample. Table 3 contains the factor loadings for both the FSU and ESU samples. Intercorrelations of the factors are shown in Table 4.

In the final model, the first factor is best described as the *image distorting style* and is comprised of help rejecting complaining, splitting-self/other, projection, and projective identification. Factor two contains the defenses of intellectualization, dissociation, isolation, and was named the *affect regulating style*. The third factor contains defenses generally thought to be healthy (self observation, self assertion, anticipation, sublimation, and humor), and thus was called the *adaptive style*.

Reliability

Internal consistency reliability of the three styles was assessed in the ESU, FSU, and combined sample using Cronbach's coefficient alpha (see Table 5). In the combined ESU and FSU sample ($n = 517$), the alpha for both the image distorting style ($\alpha = .64$) and the adaptive style ($\alpha = .61$) were found to be low in terms of potential clinical significance. The internal consistency of the affect regulating style ($\alpha = .72$) was deemed fair.

Table 4. Correlations of defense styles in the ESU ($n = 305$), FSU ($n = 212$), and combined sample ($n = 517$).

	Image distorting	Affect regulating	Adaptive
Image distorting		.50**, .59**, .54**	-.12**, -.33**, -.20**
Affect regulating	.50**, .59**, .54**		-.02, -.24**, -.12**
Adaptive	-.12*, -.33**, -.20**	-.02, -.24**, -.12**	

** $p < .001$, * $p < .005$

Note: Correlations are displayed from left to right in the ESU, FSU, and combined samples, respectively.

Table 5. Cronbach's coefficient alpha values for the defense styles.

	Combined ESU and FSU samples ($n = 517$)	ESU sample ($n = 305$)	FSU sample ($n = 212$)
Style 1 – Image distorting	.64	.66	.62
Style 2 – Affect regulating	.72	.68	.77
Style 3 – Adaptive	.61	.55	.67

DISCUSSION

This study used both exploratory and confirmatory factor analysis in two linguistically diverse samples. Every effort has been made to make our analytic approach explicit and replicable while detailed reporting has been used to illuminate our rationale for retaining specific defenses on each factor. Empirical and theoretical criteria were used for the factor analyses, and special attention was given to examination of the factor loadings, sideloadings, eigenvalues, and scree plots. In contrast to most previous DSQ studies, internal consistency and intercorrelations for the styles have been reported. The samples used in this study are also generally larger than those used in previous DSQ research.

Exploratory factor analysis revealed a three factor solution. However, not all items loaded satisfactorily. Confirmatory factor analysis was used to find the best empirically and theoretically cogent groupings. The first factor fit well into the conceptualization of Bond and colleagues' (1983) second factor in that the five defenses are primarily of an image distorting nature (help rejecting complaining, splitting of self/other, projection, and projective identification). We employed the same name as it seemed most fitting. However, the styles only had one defense in common (splitting). Two defenses (projection and splitting) were shared between our image distorting style and the immature style of Andrews and colleagues (1993).

The second factor, comprised of intellectualization, dissociation, isolation, and fantasy was reasoned to be an affect regulating style. However, none of these defenses clustered together in the works of Bond or Andrews; as such, our results reveal a unique pattern of defense use. Each defense on this factor appears to have distancing in common. In one form or another, there is a commonality of being out of touch of or distancing oneself from one's affect. These findings may be explained, in part, by the use of non psychiatric samples. It is thus possible that this style reflects processes found in healthier individuals. As such, this factor could potentially be helpful in documenting improvement in patients and in better understanding differences between presumably healthy individuals and patients presenting with specific diagnoses.

The third factor consists of healthy defenses: sublimation, self observation, humor, anticipation, and self assertion. This adaptive style is highly similar to that of Andrews and colleagues (1993), whose mature factor contained sublimation, humor, anticipation and suppression.

Despite theoretical congruency amongst the derived defense styles, many psychometric properties of the scale are questionable. Internal consistency reliabilities are generally poor and the styles are highly correlated, and only 14 of the 30 defenses were retained in our factor analyses. Similarly large numbers of defenses with inadequate loadings and theoretically inconsistent groupings have been reported on previous versions of the DSQ. For example, just 14 of 24 defenses from the DSQ-81 were retained after exploratory factor analysis (Bond et al., 1983). Further, defenses which perform well in factor analysis do not always reliably cluster together within styles; in previous DSQ research, internal consistency was acceptable (.80) only for the immature style of Andrews and colleagues (1989). In general, the most unhealthy styles exhibit greater stability

(e.g., Flannery & Perry, 1990). In this study, the most unhealthy style had poor reliability (.64). Reliability for the affect regulating style found in this study can be considered adequate (.72) for research purposes.

This may in part be the result of limitations of the study. We did not screen for psychiatric symptomatology and must make the assumption that our samples were primarily non clinical. As such, it is unclear how these findings can be generalized to other populations, including non-student populations. It is also possible that despite rigorous back translation procedures, the French and English DSQ-60 versions may have contained different meanings, which may explain, in part, different alpha levels between the groups. In addition, the nine point scale used for answer selection in the DSQ-60 as in previous versions of the scale is known to make discrimination amongst choices difficult (Clark, Watson, & Kazdin, 1998). As previously suggested by Spinhoven and colleagues (1995), a shorter scale and use of the Spearman-Brown test extension formula to determine the adequate number of items per style may have improved reliability.

Despite these limitations, our results suggest that this revised version of the DSQ, while it has the advantage of being theoretically congruent with the DSM-IV (APA, 1994), does not significantly improve on the psychometric properties of previous versions of the DSQ. The results of both the exploratory and confirmatory factor analyses suggest that a number of defense items need to be revised, or that the defenses themselves need to be removed from the scale. Less than half (14) of the 30 defenses loaded appropriately onto the styles, leaving 16 defenses (and 32 items) to be reassessed. An iterative approach should be taken to revise the poorly performing defenses and to conduct pilot testing on new items. It is crucial that all defenses perform well on the scale given the importance of making the DSQ consistent with the DSM-IV.

Others studies will also need to improve ecological validity by using treatment-seeking populations. Defense loadings and styles may vary in a clinical sample given the low base rates of certain defenses. While we had to use the mean score per defense instead of each individual defense item because of sample size, future studies will need to treat the items independently. As the recommended sample size for confirmatory factor analysis was narrowly met in this study, new studies could employ larger, more diverse samples, including equal numbers of men and women. Finally, further work needs to be conducted in the areas of predictive, test-retest reliabilities, and concurrent and discriminant validity, with particular focus on other self-report measures of defenses and the DFS of the DSM-IV.

In a recent study of the Italian version of the DSQ, San Martini and colleagues (2004) concluded that it would be "useful to improve (the) psychometric faults of the shorter scale by finding new suitable items" (p.489). While our results are somewhat consistent with other research on the DSQ, they also suggest that this revised version does not represent a significant improvement of previous versions of the scale. Present day standards and guidelines indicate that the psychometric features of the DSQ-60 must be improved upon before broad use of the scale is warranted.

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