

## Research Reports

# Can the Factor Structure of Defense Style Questionnaire (DSQ-40) Contribute to Our Understanding of Parental Acceptance/Rejection, Bullying, Victimization and Perceived Well-Being in Greek Early Adolescents?

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## Abstract

Defense Style Questionnaire (DSQ) is a self-report instrument designed to measure defense mechanisms. Although commonly used, the DSQ-40 has not been validated in early adolescent populations. The present study sought to determine the factor validity of the DSQ-40 in a sample of Greek primary school students (N = 265). Further, it aimed to investigate the relationship between defense mechanisms and perceived parental acceptance/rejection, the participation in bullying (either as bully or victim) as well as self-reported well being. Participants completed the Greek version of DSQ-40, adapted for use by this particular age group as well as measures in order to examine its convergent and discriminant validity. The findings support a four-factor solution as the most adequate for our data. Further, it was found that defense mechanisms are related to perceived parental acceptance and rejection. Finally, the results showed that the DSQ-40 can effectively discriminate participants with high/low bullying/victimization and perceived well-being. Our results indicate that the DSQ-40 is appropriate for use in late childhood. Implications for clinical practice and future studies that would confirm the appropriateness of the scale's use in younger populations are also discussed.

**Keywords:** Defense Style Questionnaire (DSQ-40), parental acceptance/rejection, bullying, well-being, factor structure

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Anna Freud (1966, p. 5) defined defense mechanisms as “the ways and means by which the ego wards off unpleasure and anxiety, and exercises control over impulsive behavior, affect and instinctive urges”. The concept of defense mechanisms is a useful heuristic in both clinical and research contexts (Andrews, Singh, & Bond, 1993). Up to date, the concept dominates mainly in psychopathology and psychiatric research on adults.

The exploration of the psychometric properties of the relevant scales in young age samples is limited and mainly reported in the discrimination between clinical and non-clinical samples. In spite of Cramer's comprehensive studies (Cramer, 2007), only recently there is an increasing interest in the influence of defense mechanisms on children and adolescents' psychological adjustment.

The origins of the quantitative measurement of defense styles dates back to Vaillant's (1971, 1976) seminal studies, who used a hierarchy of defenses and reported that mature defenses were positively correlated and immature defenses negatively correlated with an objective measure of life success. Bond, Gardner, Christian, and Sigal (1983) taking into account Vaillant's hierarchical model, suggested an immaturity-maturity continuum and developed a self-report measure, the 67-item Defense Style Questionnaire (DSQ-67); the principal aim was the assessment of possible conscious aspects of defense mechanisms, with the underlying intention "to elicit manifestations of a subject's characteristic style of dealing with conflict, either conscious or unconscious, based on the assumption that persons can accurately comment on their behaviour from a distance" (Bond et al., 1983, p. 334). The DSQ-67 discriminated between psychiatric patients and normal subjects, with patients reporting more immature defense mechanisms. The self-report methodology and the construct validity of the instrument was supported by a study in which scores of the DSQ were correlated with clinical assessments (Vaillant, Bond, & Vaillant, 1986). The 67-item DSQ ended up to a revised 88-item version developed by Bond and Vaillant (1986). The latest version was modified by Andrews, Pollock, and Stewart (1989) according to DSM-III-R; they suggested a 72-item version which included 20 defenses loading on three factors, labeled Mature, Neurotic and Immature. This version was further modified to a short 40-item questionnaire corresponding to 20 defense mechanisms which were organized into three second order factors: Mature, Neurotic, Immature.

The 40-item DSQ has proved to be a valid and reliable instrument with moderate to high Cronbach  $\alpha$  values, split-half reliability, test-retest reliability and item-scale correlations and has been used in a range of studies (Carvalho et al., 2013). The factor structure of the instrument in adults suggests a four-factor solution although the findings are inconsistent (Andrews, Pollock, & Stewart, 1989).

Cramer (2015) suggests that: (a) different defense mechanisms predominate at different points in the development and (b) each defense mechanism has its own developmental history, and that each defense has its own time of emerging predominance, which is followed by the decline of that defense at subsequent developmental periods. She identified significant differences in denial, projection and identification between age 11 and age 18. Although this work has indicated that defense mechanisms protect children from psychological distress, most of the studies have focused on late adolescents-emerging adults. Indeed, a great number of recent studies focus either on University students (e.g. Saint-Martin, Valls, Rousseau, Callahan, & Chabrol, 2013) or late adolescents (Lewis & White, 2009).

Studies in adolescent populations employ the DSQ-40 because of its practical use and theoretical underpinnings (Pour, Nezhad, Sabooni, & Mir Ahmadi, 2011; Ruuttu et al., 2006). Research has indicated that defense styles measured by the DSQ-40 are associated with psychological adjustment and psychopathology (Pour et al., 2011) with positive associations between immature defenses and maladjustment to dominate in adolescent samples (Lewis & White, 2009).

Studies exploring the factor structure of DSQ present altered versions revealing, three (Muris et al., 2003), four (Ruuttu et al., 2006) or five (Saint-Martin et al., 2013) factors. However, none of these versions has been used widely. Bond suggests (personal communication) the use of the DSQ-40 in late childhood and adolescence simply pointing out the need for some items to be appropriately reworded. The psychometric properties of the DSQ-40 have not been widely explored in younger populations, apart from a fine-grained study carried out by Ruuttu and colleagues (2006). In a sample of 211 adolescent psychiatric outpatients aged 13-19years and 199

age-matched and gender-matched controls they yielded four factors corresponding to four defense styles: mature, neurotic, image-distorting and immature, and suggested the DSQ-40 as a reliable and valid instrument for this age group.

Given that previous research has confirmed that defense mechanisms are associated with individual characteristics and psychological adjustment, perceived parenting as well as experiences with bullying and victimization and perceived psychological well being, these constructs have also been used in the present study to investigate the convergent and divergent validity of the DSQ. Research has suggested that perceived parental rejection and indifference is associated with the use of more immature defense mechanisms (Dubois-Comtois & Moss, 2008). Fonagy (2008) links defensive patterns of behavior with bullying, making links to attachment theory and Youell (2006) fits bullying into the psychological account of splitting and projection. Further, it has been shown that bullies often use projection in an attempt to escape from their own 'painful' experienced emotions (White, 2004), whereas victimized children seem to employ more defense mechanisms such as isolation, autistic fantasy (Cilliers, 2012). Lastly, studies have linked immature defense mechanisms with the development of various psychological difficulties such as anxiety and depression (Blaya et al., 2007) as well as impaired self-esteem (Zeigler-Hill, Chadha, & Osterman, 2008).

The shortage of studies using the DSQ-40 in early adolescents indicate the need for further exploration of the appropriateness of the use of DSQ-40 for this age group (Cramer, 2007). Furthermore, a range of Greek studies have explored the psychometric properties of the DSQ-88 and its associations with health/treatment dimensions in adults with particular medical illnesses (Hyphantis, 2010). However, no study has explored the psychometric properties of the DSQ-40 in younger populations (i.e. early adolescents).

The aim of the present study is to explore (a) the factorial structure of DSQ-40 (b) to identify the internal consistency of the factors (sub-scales) emerged from the exploration of the factor structure of the questionnaire, as well as its convergent validity and (c) to test whether the defensive styles emerged from the factor analysis could differentiate individuals according to their gender and age as well as to the extent they get involved in bullying and victimization and the level of their self-reported well-being.

## Method

### Participants

Two hundred and sixty-five children and early adolescents took part in this study, of which 133 (50.2%) were boys and 132 (49.8%) were girls. The sample includes 105 (39.5%) fifth grade students, and 161 (61.5%) sixth grade students ( $M_{age} = 11.19$ ,  $SD = .66$ ). The students come from different schools of Athens, Crete and Ioannina, Greece.

### Measures

The *Defense Style Questionnaire* (DSQ; Andrews et al., 1993) is a self-report inventory that measures specific defense mechanisms in terms of DSM-IV concepts. DSQ comprises of 40 items in a 9-point Likert format that derive scores for 20 defense mechanisms, two items for each. These mechanisms are organized in four sub-factors (Immature, Mature, Image-distorting and Neurotic), often referred to as defense styles. Scores for

defense mechanisms and defense styles are formed by averaging the ratings for relevant items. All DSQ items were translated in Greek, and blindly back-translated by native English speakers.

Perceived parental acceptance and rejection was measured with the *Parental Acceptance-Rejection Questionnaire– child version* (PARQ\_child, Rohner, 2005). Participants responded to two versions of the child PARQ, assessing their perceptions of maternal (PARQ\_Mother) and paternal (PARQ\_Father) acceptance-rejection, respectively. Both versions of the PARQ are translated and adapted into Greek (Papadaki & Giovazolias, 2015; Tsaousis, Giovazolias, & Mascha, 2012). Higher scores in these scales indicate higher perceived parental acceptance. Both scales (paternal, maternal) had high reliability with  $\alpha = .93$  and  $\alpha = .92$ , respectively.

The participants also completed the *Peer Experiences Questionnaire* (PEQ; Vernberg, Jacobs, & Hershberger, 1999), translated and adapted by Giovazolias, Kourkoutas, Mitsopoulou, and Georgiadi (2010) including two 9-items subscales: Victimization of Self (VS) (e.g., “another student bothered me in a mean way”; 9 items) and Victimization of Others (VO). In the present study internal consistency estimates for individual subscales were: VS = .84 and VO = .86.

We measured psychological adjustment with the *Psychological Well-being scale* (Diener & Biswas-Diener, 2008). The Psychological Well-Being scale (PWB) consists of eight items describing important aspects of human functioning ranging from positive relationships, to feelings of competence, to having meaning and purpose in life. High scores signify that respondents view themselves in very positive terms in diverse areas of functioning. The reliability for this study was high ( $\alpha = .84$ ).

## Procedure

The administration of the questionnaires took place in participants’ classrooms, during ordinary class sessions and lasted approximately twenty minutes. Issues of anonymity and confidentiality were particularly highlighted, along with the voluntary participation in the study. Permission to conduct the research was granted by the Greek Ministry of Education. There was no payment or other incentive to participate in the study. After the completion of the questionnaires, children were debriefed and thanked for their participation. The data were collected during the 2013 spring semester. Eventually, they were encoded, transferred, and analyzed with SPSS 21, at the University of Crete.

## Data Analyses

Exploratory Factor Analyses (EFA) was utilized instead of Principal Components Analysis (PCA). Previous studies used PCA to reduce correlated observed variables to a smaller set of independent composite variables (Park, Dailey, & Lemus, 2002), however we chose EFA for the following reasons:

- a. We wanted to test a previous theoretical model of latent factors underlying the variables observed
- b. We presumed correlated latent factors. Therefore, a geomin (oblique) instead of a quartimax (orthogonal) rotation criterion was chosen
- c. EFA is conceptually more realistic in identifying common factors.

Regarding the examination of other psychometric characteristics, we used correlations coefficient to test the DSQ internal consistency. We also used Pearson’s correlations to examine both the construct validity (i.e.

correlation coefficients between each of the four DSQ-40 defense styles) and the convergent validity of the measure with other constructs (i.e. parental acceptance-rejection, psychological well-being and bullying/victimization). We also examined the measure's discriminant validity by testing gender and age differences (independent samples t-test) in the use of defenses. Moreover, we investigated the ability of DSQ to distinguish different groups of individuals, using logistic regression in order to predict participants' self-reported well-being as well as their participation in bullying acts, either as bullies or victims. The allocation of participants in the high/low groups was made using median split analysis (high group = +1SD, low group = -1SD, respectively).

## Results

### Exploratory Factor Analysis (EFA)

The DSQ-40 items were submitted to EFA, to determine factor structure using the mean scores for each defense. Geomin oblique rotation was employed. We used the Mean-and Variance-adjusted Weighted Least Square (WLSMV) estimator in Mplus 6 because both the univariate and multivariate normality of the data were not met (Muthén & Muthén, 2007). The goal was to see how the 20 individual defenses loaded onto factors, commonly referred to as defense styles. To determine the number of factors, we examined the goodness of fit for each proposed model based on criteria of goodness of fit, interpretability of the solution, and strength of parameter estimators.

First, we examined the goodness of fit (root mean square of approximation-RMSEA; root mean squared residual-SRMR; comparative fit index-CFI), for each proposed model (one- to four-factor models). The findings supported a four-factor solution as most adequate for our data (Table 1).

Table 1

Summary of Goodness of Fit Statistics for EFA Contrasting Alternative Models of DSQ-40

Model	$\chi^2$ (df)	RMSEA	CFI	TLI	SRMR
Model 1: 1 Factor – 20 defenses	426(170)***	.076	.685	.648	.079
Model 2: 2 Factor – 20 defenses	276(151)***	.057	.846	.806	.054
Model 3: 3 Factor – 20 defenses	175(133)***	.035	.947	.925	.039
Model 4: 4 Factor – 20 defenses	136(116)***	.026	.974	.958	.033

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

\*\*\* $p < .001$ .

Second, we examined the eigenvalues. The Kaiser (1960) criterion, which recommends that the number of factors be equivalent to the number of eigenvalues greater than 1, suggested five factors. Eigenvalues were 4.20 for the first and 1.12 for the fifth factor.

Next, we examined the scree plot as proposed by Cattell (1966) as a graphical method for determining the number of factors. Cattell recommended retaining all eigenvalues in the sharp descent before the point at which the plot begins to level off. The plot suggested that a model with four factor solution was most appropriate for consideration.

Lastly, we considered the interpretability of the results by examining the factor pattern loadings (Table 2).

Table 2

Exploratory Factor Analysis Pattern Coefficient Matrix (4-Factor Model)

Defense Style	Mature	Immature	Image-distorting	Neurotic
Suppression	.18		(.22)	
Sublimation		(.18)		(.19)
Humor	<b>.46</b>			
Rationalization			(.34)	
Anticipation	<b>.53</b>			(.37)
Projection		<b>.33</b>		
Passive Aggression		<b>.53</b>		
Autistic Fantasy		.10	(.41)	
Somatization		<b>.52</b>		
Displacement		<b>.45</b>		
Acting Out		<b>.61</b>		
Reaction formation				<b>.30</b>
Undoing				<b>.50</b>
Idealization				<b>.54</b>
Pseudo-altruism				<b>.65</b>
Denial			<b>.75</b>	
Dissociation			<b>.60</b>	
Devaluation			<b>.42</b>	
Isolation			<b>.34</b>	
Splitting		<b>.66</b>		

Note. In parentheses we present the cross-loadings and in italics are the retained loadings on Factors 1 and 2. In bold we present meaningful factor loadings (i.e. >.20).

With regard to item selection for the four factors, factor loadings >.20 were considered meaningful. Some defenses appeared to have double loadings on one or two factors (i.e., loadings of greater than .20) and were not interpretable on its factor and were excluded. On the basis of those criteria, two defenses were excluded; sublimation (mature factor), and realization (mature factor) had loadings on different factors than the original and it was difficult to interpret them. However, we retained two defenses: Suppression (mature), and autistic-fantasy (immature). The first had a double loading on two factors (with loadings of .18 and .22 on Factors 1 and 3 respectively), but the first loading was sensible because of the defense’s nature. The second defense style had also a cross-loading more than .20, but an acceptable correlation with Factor 2 (.40) and it was more interpretable to use it on this factor (immature).

### Internal Consistency

DSQ-40 psychometric characteristics (Cronbach’s alpha values and defenses correlations are presented in Table 3) suggested satisfactory reliability for the four DSQ defense styles.

Table 3

*Internal Consistency Indices for the Four Subscales of the Greek-Adapted Version of DSQ-40 (N = 265)*

Factor	Number of items	Cronbach's $\alpha$	Item-total correlations (range)
1. Mature	3	.58	.31-.33
2. Immature	7	.75	.42-.55
3. Image-distorting	4	.61	.30-.49
4. Neurotic	4	.60	.29-.43

## Construct Validity

Table 4 presents the correlation coefficients between each of the four DSQ-40 defense styles. The inter-correlations range from .20 (between Image-distorting and Neurotic style) to .62 (between Immature and Image-distorting style).

Table 4

*Means, Standard Deviations and Inter-Correlations Among Study Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. PARQ_f	83.53	11.09								
2. PARQ_m	86.12	11.18	.62**							
3. Mature	55.65	11.98	.08	.19**						
4. Immature	44.40	17.15	-.29**	-.18**	.29**					
5. Neurotic	44.37	11.10	.14*	.18**	.37**	.25**				
6. Image-distorting	41.63	13.51	-.27**	-.18**	.35**	.62**	.20**			
7. Bullying	11.76	4.34	-.32**	-.34**	-.08	.21**	-.04	.18**		
8. Victimization	14.62	6.00	-.31**	-.24**	-.13*	.28**	.05	.18**	.55**	
9. Well-being	46.94	7.42	.47**	.50**	.20**	-.22**	.17**	-.07	-.31**	-.30**

Note. PARQ\_f = Paternal acceptance. PARQ\_m = Maternal acceptance.

\* $p < .05$ . \*\* $p < .01$ .

## Convergent Validity

The results in Table 4 show that the Mature factor was positively associated with Psychological Well-being whereas the Neurotic factor was positively associated with paternal acceptance and Psychological Well-being. Finally, the Immature factor was negatively associated with both paternal and maternal acceptance and with Psychological well being.

## Discriminant Validity

We also compared use of defenses between genders; girls reported less use of mature and image-distorting styles than did boys. On the individual defenses, girls reported more use of reaction formation, but less anticipation, denial, and dissociation.

Further, we compared the use of defenses between participants of the 5<sup>th</sup> and the 6<sup>th</sup> grade. We found that 5<sup>th</sup> graders scored higher in the Neurotic factor and less use in the Immature factor. With regards to specific defenses, it was found that 5<sup>th</sup> graders scored higher in anticipation, pseudoaltruism and idealization, whereas 6<sup>th</sup> graders scored higher in passive aggression, displacement, dissociation, splitting and rationalization.

As discriminant validity indicates also the ability of a scale to distinguish different groups of individuals, we performed three separate logistic regression analyses (see Table 5) to investigate whether individual scores in the four Defense Styles (Immature, Mature, Image-distorting and Neurotic) could predict: a) the levels of self-reported psychological well-being, b) the participation in bullying behaviours and c) the experience of victimization.

Table 5

*Logistic Regressions for the Prediction of Psychological Well-Being (PWB), Bullying and Victimization From DSQ-40 Sub-Scales*

Predicting Variable	Predictor	B	SE	Odds ratio	95% CI	Wald statistic
PWB	Immature	-.055	.02	.95	0.92-0.98	11.16***
	Mature	.055	.02	1.06	1.02-1.10	7.06**
	Image-distorting	-.002	.02	1.00	0.96-1.04	-.001
	Neurotic	.043	.02	1.05	1.00-1.09	3.98*
Bullying	Immature	.040	.01	1.04	1.01-1.06	10.11***
	Mature	-.009	.01	.99	0.96-1.02	-.364
	Image-distorting	.024	.02	1.02	0.99-1.06	2.23
	Neurotic	-.037	.02	.96	0.93-0.99	5.37**
Victimization	Immature	.070	.02	1.07	1.03-1.12	11.70***
	Mature	-.081	.02	.09	0.88-0.97	10.89***
	Image-distorting	.009	.02	1.01	0.96-1.06	-.150
	Neurotic	.018	.02	1.02	0.97-1.07	-.589

Note. PWB = Psychological Well-Being.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

In the first analysis, it was found that Immature, Mature, Image-distorting and Neurotic factors were entered as predictor variables and Psychological Well-being as predicting variable. A test of the full model with the four predictors was statistically reliable, [ $\chi^2(4) = 26.20, p < .001$ ], indicating that, as a set, the predictors reliably distinguished between high-level (HL) and low-level (LL) individuals in perceived psychological well-being. The variance in the HL status accounted for was large, with Nagelkerke  $R^2 = .39$ . Prediction was good, with 62.1% of HL individuals and 78.3% of LL individuals correctly being predicted, for an overall success rate of 71.1%, while predictive values positive (sensitivity) and negative (specificity) were 73% and 69%, respectively. Table 5 shows the regression coefficient, Wald statistic, and odds ratio for each of the three predictors. According to the Wald criterion, the Immature, the Mature and the Neurotic scores predicted HL status. This finding implies that the odds ratios of these predictors (.95, 1.06 and 1.04, respectively) show a great change in the likelihood of the individual demonstrating high levels of well-being on the basis of one unit change in these variables (i.e., Immature, Mature and Neurotic factors).

In the second analysis, we entered again the Immature, Mature, Image-distorting and Neurotic factors as predictor variables and Bullying as predicting variable. A test of the full model with the four predictors was statistically reliable,  $\chi^2(4) = 32.19, p < .001$ , indicating that, as a set, the predictors reliably distinguished between HL and LL individuals in participation in bullying behaviours. The variance in the HL status accounted for was moderate, with Nagelkerke  $R^2 = .25$ . Prediction was good, with 82.3% of HL individuals and 66.8% of LL individuals correctly being predicted, for an overall success rate of 75.4%, while predictive values positive

(sensitivity) and negative (specificity) were 75% and 77%, respectively. According to the Wald criterion, the Immature, and the Neurotic scores predicted HL status. This finding implies that the odds ratios of these predictors (1.04, and .96, respectively) show a great change in the likelihood of the individual demonstrating high levels of bullying behaviours on the basis of one unit change in these variables (i.e., Immature and Neurotic factors).

Lastly, in the third analysis, we entered again the four DSQ factors as predictor variables and Victimization as predicting variable. A test of the full model with the four predictors was statistically reliable,  $\chi^2(4) = 34.57$ ,  $p < .001$ , indicating that, as a set, the predictors reliably distinguished between HL and LL individuals in victimization. The variance in the HL status accounted for was large, with Nagelkerke  $R^2 = .38$ . Prediction was good, with 80.9% of high-level individuals and 75.6% of low-level individuals correctly being predicted, for an overall success rate of 73.3%, while predictive values positive (sensitivity) and negative (specificity) were 78% and 79%, respectively. According to the Wald criterion, the Immature, and the Mature scores predicted HL status. This finding implies that the odds ratios of these predictors (1.07, and .92, respectively) show a great change in the likelihood of the individual demonstrating high levels of victimization on the basis of one unit change in these variables (i.e., Immature and Mature factors).

## Discussion

The study suggests that the DSQ-40 is a valid and reliable instrument for use in late childhood/early adolescence. This instrument which was initially developed for adults seems, with minor phrasing changes, to be able to provide researchers and clinicians with valid information about children emotional maturity-immaturity styles, shedding light on their psychological adjustment. This suggestion is supported by appropriate scores found in different aspects of validity, tested in a non-clinical sample of Greek children/early adolescents: construct validity, convergent validity and discriminant validity.

To our knowledge, this is the first study exploring the psychometric properties of the DSQ-40 in an early-aged sample. The present study failed to support the three factor solution suggested in the original study (Andrews et al., 1993) with adults. The four factor structure comes out well, in spite of cross-loadings. Cross-loadings also appear in studies with both adults (Hyphantis, 2010) and adolescents (Hayashi, Miyake, & Minakawa, 2004).

The *first* factor consisted of three mature defenses: suppression, humor, anticipation often employed to reduce anxiety and distress. Two defenses, sublimation and rationalization, failed to contribute to this factor. Not having reached abstract thinking at this particular age possibly restricts the development of complex defense mechanisms.

The *second* factor consists of immature defenses: projection, passive aggression, autistic fantasy, somatisation, displacement, and acting out. This factor involves maladaptive defense mechanisms, reported also by Ruutu et al. (2006), which very often appear in object relationships and dominate in clinical work, especially in psychoanalytic psychotherapy (e.g. Youell, 2006). Moreover, in consistency with previous studies (e.g. Andrews et al., 1993; Hyphantis, 2010; Steiner et al., 2001), splitting gives a remarkable loading on this factor, although it is conceptually consistent with the third factor (image distorting). This factor differentiates from the third one, image-distorting, although they both depict immature personality patterns, in terms of action-orientation and image-orientation, respectively. The *third* factor, also in line with Ruutu et al. (2006), depicts an

image-distorting defense style. It comprises denial, dissociation, devaluation, isolation and splitting. The image distorting defenses, associated with borderline and narcissistic defenses (Conte & Plutchik, 1995) indicate coping that aims to distort self and object images to conform totally with a particular meaning or emotional state. The *fourth* factor comprises neurotic defenses indicating an intermediate defense style that appears more private comparing to immature (action-oriented) and image-distorting (image oriented) defenses. Possibly, this is the reason of no cross-loadings (except the reaction formation) in this factor. The defense mechanisms loading on this factor are: reaction formation, undoing, idealization, pseudo-altruism. These are in line with those reported in the original study (Andrews et al., 1993), and also in a range of studies in adolescents from different nationalities (Hayashi et al., 2004). The four factors described above and the correlations amongst them support Vaillant's (1971) continuum from maturity to immaturity.

Concerning the internal consistency coefficients of the scale, the study supports previous findings reporting relatively low reliability coefficients for the mature defense style in both adults and adolescents but sufficient to high for the neurotic, immature and the image-distorting defense styles (Karagiannopoulou, Athanasopoulou, & Hyphantis, 2015). Perhaps, the lower alpha coefficients are affected by the fewer items comprising these two styles (Zeigler-Hill et al., 2008). Nevertheless, all Cronbach alphas were greater than 0.5, justifying the factorial structure of the four styles.

Overall, although our sample consists of children in late latency/early adolescence, our findings about the factor structure are consistent with the adult frontline studies (Andrews et al., 1993; Bond et al., 1983) and also with later studies in both adolescents and adults (e.g. Sammallahti, Holi, Komulainen, & Aalberg, 1996). Our suggestion for two immature components corresponding to (immature/action-oriented and image-distortion/image-oriented) possibly depicts the complexity of the states of mind associated with the latter part of latency (ten or eleven years) and those associated with the early part of puberty (twelve or thirteen years) (Waddell, 2002). To our knowledge, the only recent study focusing on the factor structure of the DSQ-40 (Saint-Martin et al., 2013) suggests a five factor structure depicting discrepancies with defense theory. The consistency of our findings with the only, comprehensive study on the exploration of the factor structure of the DSQ-40 in adolescents (Ruutu et al., 2006), lends support to the appropriateness of this instrument for early adolescents.

Our study supports previous findings indicating links between defense mechanisms and adjustment problems, anxiety (e.g. Blaya et al., 2007) parental acceptance/rejection (Dubois-Comtois & Moss, 2008) and forms of children's interaction with their parents (von der Lippe, 2000). Greater maturity of defense styles was associated with lower scores in bullying behaviours and with higher scores of psychological well-being and parental acceptance. These findings indicate meaningful strong associations mainly for the immature factor that was negatively related with parental and maternal acceptance and also with psychological well-being. It is suggested that mature defenses protect against bullying behaviours supported by a positive perception of psychological well-being and parental acceptance (Fonagy, 2008). Strength to this suggestion is lent by the negative relationship between immature defenses with well-being and parental acceptance.

The study supports previous findings concerning gender differences in defense use. Boys appear to use more mature and image-distorting defense mechanisms than girls. However, when focusing on particular defenses this was the case only for anticipation (previous studies indicate a higher score in suppression) while for two image-distorting defense mechanisms, namely denial and dissociation. Possibly, boys fail to acknowledge some aspects of external reality (denial, dissociation) while girls seem to reside to less pathological defense

mechanisms. This is possibly indicating either lower levels of stress for females of this age-range or a feminine defense in terms of changing the inner affect (Cramer, 2007).

Interestingly, age differences were significant for defense styles, although the age range in the current sample was very small. Latency (5<sup>th</sup> graders) implies a “quite” period without new upheavals but early adolescence-puberty (6<sup>th</sup> graders) seems to involve regression in the direction of infancy (Waddell, 2002); internal conflicts and anxieties challenge internal structures and are met by a range of immature defense strategies. In particular, the 5<sup>th</sup> graders’ scored higher in two neurotic defenses: pseud altruism and idealization to sustain the self and on one mature defense: anticipation, indicating tolerance to future discomfort. Moreover, the 6<sup>th</sup> grade students, in a possible attempt to bypass the complex and painful task of working through depressive anxieties (Waddell, 2002), scored higher in three immature and one image-distorting defense, namely, passive aggression, displacement, splitting and dissociation, respectively. Perhaps, intense anxieties and impulses stir in an intense need to displace and reside with passive aggression and splitting possibly strongly reinforced by the underlying Oedipal fears (Waddell, 2002); 6<sup>th</sup> graders avoid the recognition of some aspects of external reality to protect themselves from excessive anxieties, using dissociation.

Moreover, the study supports clinical findings suggesting emotional immaturity to be considered as a factor underlying both patterns of behavior; children’s involvement in high levels of both bullying behaviours and victimization was associated with the use of more immature defense mechanisms. Also, mature defenses were associated with lower risk of victimization and neurotic defenses with lower risk of bullying possibly indicating that victims might be considered more emotionally mature than (Fonagy, 2008). The study also supports associations between emotional maturity and psychological adjustment (Benson & Elder, 2011); children with higher levels of psychological well-being used more mature and less immature defense mechanisms.

### Limitations – Future Directions

In the present study, valid and widely used instruments provide evidence for the appropriateness of the adult version of the DSQ-40 for use in late childhood-early adolescents. Overall, this study supports the appropriateness of the use of the DSQ-40 in early adolescence and provides important evidence to support the link of defense mechanisms with parental acceptance, psychological adjustment issues (both in the form of involvement in bullying behaviours and impaired well-being) as well as gender and age differences in the use of specific mechanisms.

However, the study has some limitations. The study used a convenient sample, there was no comparison between clinical and non-clinical groups and the age range was small not allowing for direct comparisons with previous findings. Also, our setting did not permit test-retest examination which would have provided a complete picture of the reliability of the DSQ-40. The failure of sublimation and rationalization to contribute to the factor structure raises the need for future cross-sectional as well as longitudinal studies to test the contribution of these defenses in different age samples and also in clinical and non-clinical groups to further support the structure and the discriminant validity of the DSQ-40 in late childhood. Further, as we focused only on a Greek sample, it would be interesting to extend this research to other cultural groups and compare how traditional ideas and cultural values among populations from various backgrounds can influence the use of defense styles in relation to the constructs explored in this study.

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## Author Contributions

The first two authors have contributed equally to the paper.

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## Appendix: DSQ-40\_Greek

Item no.	Original Item	Greek Item
1	I get satisfaction from helping others and if this were taken away from me I would get depressed.	Με ευχαριστεί να βοηθάω τους άλλους και θα με λυπούσε πολύ αν μου το στερούσαν.
2	I'm able to keep a problem out of my mind until I have time to deal with it.	Μπορώ να βγάλω ένα πρόβλημα από το νου μου ώσπου να βρω χρόνο να ασχοληθώ με αυτό.
3	I work out my anxiety through doing something constructive and creative like painting or woodwork.	Εκτονώνω το άγχος μου κάνοντας κάτι εποικοδομητικό και δημιουργικό, όπως το να αθλούμαι, να παίζω μουσική ή να τακτοποιώ τα πράγματά μου κτλ.
4	I am able to find good reasons for everything I do.	Καταφέρνω να δικαιολογώ κάθε πράξη μου .
5	I'm able to laugh at myself pretty easily.	Μπορώ πολύ εύκολα να διασκεδάζω με τα λάθη μου (να σκέφτομαι τα λάθη μου και να γελώ).
6	People tend to mistreat me.	Νιώθω ότι οι άνθρωποι (έχουν την τάση να) μου φέρονται άσχημα.
7	If someone mugged me and stole my money, I'd rather he be helped than punished.	Αν κάποιος με λήστευε στο δρόμο, θα προτιμούσα να γίνουν προσπάθειες να βοηθηθεί παρά να τιμωρηθεί.
8	People say I tend to ignore unpleasant facts as if they didn't exist.	Οι άλλοι λένε πως έχω την τάση να αγνοώ (παραβλέπω) τα δυσάρεστα γεγονότα, σαν να μην έγιναν ποτέ.
9	I ignore danger as if I was Superman.	Αψηφώ τον κίνδυνο σαν να ήμουν ο σούπερμαν.
10	I pride myself on my ability to cut people down to size.	Είμαι περήφανος/η για την ικανότητά μου να δείχνω στους ανθρώπους ότι δεν είναι τόσο σπουδαίοι όσο φαντάζονται.
11	I often act impulsively when something is bothering me.	Συχνά αντιδρώ παρορμητικά όταν κάτι με ενοχλεί.
12	I get physically ill when things aren't going well for me.	Μπορεί να αρρωστήσω όταν τα πράγματα δεν μου πηγαίνουν καλά.
13	I'm a very inhibited person.	Είμαι ένα πολύ συνεσταλμένο άτομο.
14	I get more satisfaction from my fantasies than from my real life.	Παίρνω περισσότερη ικανοποίηση από τις φαντασιώσεις μου απ' ό,τι από την πραγματική μου ζωή.
15	I've special talents that allow me to go through life with no problems.	Έχω κάποιες ιδιαίτερες ικανότητες που μου επιτρέπουν να ζω χωρίς προβλήματα.
16	There are always good reasons when things don't work out for me.	Πάντα κάτι φταίει όταν τα πράγματα δεν μου πάνε καλά.
17	I live more of my life in my dreams than in real life [instead of: I work more things out in my daydreams than in my real life].	Ζω περισσότερα πράγματα ονειροπολώντας παρά στην πραγματική ζωή μου.
18	I fear nothing.	Δεν φοβάμαι τίποτα.
19	Sometimes I think I'm an angel and other times I think I'm a devil.	Μερικές φορές νοιώθω ότι είμαι ένας άγγελος και άλλες ότι είμαι ένας διάβολος.

Item no.	Original Item	Greek Item
20	I get openly aggressive when I feel hurt.	Γίνομαι άμεσα επιθετικός όταν πληγώνομαι.
21	I always feel that someone I know is like a guardian angel.	Πάντα νοιώθω πως κάποιος άνθρωπος που γνωρίζω είναι κάτι σαν φύλακας άγγελος για μένα.
22	As far as I'm concerned, people are either good or bad.	Για μένα, οι άνθρωποι είναι ή καλοί ή κακοί.
23	If my boss bugged me, I might make a mistake in my work or work more slowly so as to get back at him.	Αν ο δάσκαλός μου μου έκανε τη ζωή δύσκολη, μπορεί με τη σειρά μου να συμπεριφερόμουν με τρόπο που θα έκανε τη δική του ζωή δύσκολη.
24	There is someone I know who can do anything and who is absolutely just and fair.	Γνωρίζω κάποιο άτομο που μπορεί να κάνει τα πάντα και είναι απολύτως έντιμος/η και δίκαιος/η.
25	I can keep the lid on my feelings if letting them out would interfere with what I'm doing.	Μπορώ να καταπιέζω τα συναισθήματά μου, αν νοιώθω ότι παρεμποδίζουν ό,τι κάνω.
26	I'm usually able to see the funny side of an otherwise painful predicament.	Συνήθως, μπορώ να δω την αστεία πλευρά μιας κατά τα άλλα δυσάρεστης κατάστασης.
27	I get a headache when I have to do something I don't like.	Με πιάνει πονοκέφαλος όταν έχω να κάνω κάτι που δεν μου αρέσει.
28	I often find myself being very nice to people who by all rights I should be angry at.	Συχνά πιάνω τον εαυτό μου να είμαι πολύ καλός με ανθρώπους που θα είχα κάθε λόγο να είμαι θυμωμένος μαζί τους.
29	I am sure I get a raw deal from life.	Σίγουρα η ζωή μου φέρεται σκληρά.
30	When I have to face a difficult situation, I try to imagine what it will be like and plan ways to cope with it.	Όταν ξέρω ότι θα πρέπει να αντιμετωπίσω μια δύσκολη κατάσταση, προσπαθώ να φανταστώ πώς θα είναι και σχεδιάζω έναν τρόπο να τα βγάλω πέρα.
31	Doctors never really understand what is wrong with me.	Όταν πάω στο γιατρό, νιώθω ότι δεν καταλαβαίνει τι μου συμβαίνει (τι δεν πάει καλά σε μένα).
32	After I fight for my rights, I tend to apologize for my assertiveness.	Αφού αγωνιστώ για τα δικαιώματά μου, μετά έχω την τάση να απολογούμαι για τον ευθύ και έντονο τρόπο μου.
33	When I'm depressed or anxious, eating makes me feel better.	Όταν είμαι αγχωμένος ή στενοχωρημένος, το να τρώω με κάνει να νοιώθω καλύτερα.
34	I'm often told that I don't show my feelings.	Συχνά μου λένε ότι δεν δείχνω τα συναισθήματά μου.
35	If I can predict that I'm going to be sad ahead of time, I can cope better.	Όταν μπορώ να προβλέψω ότι θα στενοχωρηθώ, μπορώ να το αντιμετωπίσω καλύτερα.
36	No matter how much I complain, I never get a satisfactory response.	Όσο κι αν παραπονούμαι, δεν βρίσκω ποτέ την ανταπόκριση που με ικανοποιεί.
37	Often I find that I don't feel anything when the situation would seem to warrant strong emotions.	Συχνά ανακαλύπτω ότι δεν νοιώθω τίποτα σε καταστάσεις που θα δικαιολογούσαν έντονα συναισθήματα.
38	Sticking to the task at hand keeps me from feeling depressed or anxious.	Το να ασχολούμαι με προσηλωση με μια συγκεκριμένη εργασία, με προστατεύει από το άγχος και τη στενοχώρια.

Item no.	Original Item	Greek Item
39	If I were in a crisis, I would seek out another person who had the same problem.	Αν αντιμετωπίζα μια κρίση, θα αναζητούσα κάποιο άλλο πρόσωπο που θα είχε το ίδιο πρόβλημα με μένα.
40	If I have an aggressive thought, I feel the need to do something to compensate for it.	Αν κάνω κάποια επιθετική σκέψη, νοιώθω την ανάγκη να κάνω κάτι για να εξιλεωθώ.

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