

## THE INTERPLAY OF ATTACHMENT STYLES AND DEFENSE MECHANISMS ON EATING DISORDERS RISK: CROSS-SECTIONAL OBSERVATION IN THE COMMUNITY POPULATION

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## Abstract

**Objective:** Eating Disorders (Eds) are considered a broad group of pathological conditions characterized by dysregulated eating-related behaviors and habits. Attachment styles and defense mechanisms appear to be linked to the development of EDs-related unhealthy behaviors; however, these factors have been seldom investigated jointly. This study aimed at exploring the shared association between attachment styles, defense mechanisms, and EDs-related behaviors; additionally, we aimed at investigating whether defense mechanisms might be potential mediators of the association between attachment and Eds behaviors.

**Method:** A community-based sample was recruited (88% females, mean age= 22.33 ± 4.81 years) and underwent a comprehensive evaluation protocol assessing attachment styles, defense mechanisms, and risk of eating disorders.

**Results:** Several shared associations between attachment styles, defense mechanisms, and eating disorders scores were found. Additionally, a maladaptive defense style appeared to be a significant mediator of the association between attachment styles and EDs-related symptoms.

**Conclusions:** The integrated evaluation of attachment and defense mechanisms could generate a more comprehensive framework of the psychological antecedents related to Eating Disorders, and it could be a beneficial factor involved in therapies.

**Key words:** clinical psychology, attachment, defense mechanisms, maladaptive style, psychological maladjustment, eating disorders

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## Introduction

The term “Eating Disorders” (EDs) describes a broad range of pathological conditions characterized by dysregulated eating-related behaviors and habits (American Psychiatric Association, 2013). Since EDs frequently expose individuals to severe psychological and medical negative outcomes (Hricova et al., 2018; Barberis et al., 2018), a better understanding of the potential antecedent factors related to EDs is crucial.

A longstanding line of clinical research showed that interpersonal aspects are a core factor in the onset of EDs symptomatology (Arcelus et al., 2012), and in this regard dimensions such as dysfunctional relational experiences during infancy have been highlighted as a major risk factor (Gonçalves et al., 2019). It is known

that the quality of early family relationships might play a role in the development of children’s affect regulation (Dicé et al., 2017; Freda & Dicé, 2017; Lindblom et al., 2016). In this regard, attachment theory (Bowlby, 1969) provided a relevant contribution to the understanding of the development of intimate relationships. Attachment refers to how individuals form emotional bonds in childhood and how these influence future relationships (Hazan & Shaver, 1987).

It was showed that attachment styles are related to the ability to manage individual emotions (Cooke et al., 2016). Specifically, Tasca (2019) argues that an insecure attachment, since it negatively affects the ability to modulate emotions, can foster the development of different types of psychiatric symptoms, including EDs. A recent meta-analysis (Faber et al., 2017) reported

that attachment insecurity was significantly related to more problematic eating behaviors, whereas higher attachment security was related to lower unhealthy eating behaviors.

Although several cross-sectional (Kuipers, et al., 2016; Troisi et al., 2005) and longitudinal (Ferriter et al., 2010; Dakanalis et al., 2015) studies have consistently highlighted the association between attachment insecurity and unhealthy eating-related symptoms and attitudes, a consensus regarding the presence of potential mediating factors is still inconclusive. Several psychological mediators have been suggested as potential contributors to the onset of EDs symptomatology (Cortès-García et al., 2019). The Authors of a recent meta-analysis including seventy studies (Faber et al., 2018) found an effective association between attachment and EDs; additionally, the Authors highlighted the need to develop further researches focused on investigating potential mediators of the association between attachment and problematic eating behaviors.

Particularly interesting is also the association between attachment styles and defense mechanisms, through which individuals cope with stressful events. Since the newborn generally develops not only the awareness of both him/herself and others, but also the protective mental processes that allow him/her to cope with stressful events in the attachment relationship (Laczkovics et al., 2018), the quality of experienced attachment represents one of those factors that might influence the development of dysfunctional defense mechanisms (Khademi et al., 2019). It is thus reasonable to hypothesize that such defense mechanisms are part of the relationship between attachment and EDs.

Findings from previous studies (Besharat & Khajavi, 2013; Laczkovics et al., 2018) suggested that defense mechanisms might mediate the association between attachment dimensions and psychopathology. Defense styles are commonly categorized in three patterns, namely mature, neurotic and immature (Andrews et al., 1993); furthermore, similarly to attachment, defense styles originate during infancy (Cramer, 1991; Hilsenroth et al., 2003). The mature defense style describes normal and adaptive processes of coping with distressing experiences, whereas the immature and the neurotic styles refer to dysfunctional and maladaptive coping strategies (Besharat & Khajavi, 2013).

In the context of EDs, previous findings have already shown the existing link between defense mechanisms and the development of dysfunctional eating behaviors (Poikolainen et al., 2001; Blaase & Elklit, 2001). Patients with EDs seem usually incline to exhibit peculiar defense styles often characterized by higher levels of sublimation, undoing, and passive aggression compared to controls (Poikolainen et al., 2001); moreover, women with EDs frequently adopt a primitive defense style and perceive themselves as more exposed to stress than healthy women (Blaase & Elklit, 2001). Eventually, it has been recently suggested that women with EDs might benefit from group psychotherapy to improve their defense and adaptation strategies (Hill et al., 2015).

Attachment relationships and defense strategies both appear to be significantly linked to the development of EDs-related unhealthy behaviors. However, these factors have been seldom investigated jointly. Therefore, the main purpose of the present study is to explore the shared association between attachment styles, defense mechanisms and EDs-related symptoms. Additionally, since defense mechanisms are commonly considered automatic protective responses to negative events

(Prout et al., 2019), we aimed at investigating whether defense mechanisms might be a potential mediator of the association between attachment and EDs.

Specifically, this study intended to test a model in which attachment dimensions are associated with defense mechanisms styles, which lead in turn to problematic eating behaviors. In line with the attachment theoretical framework, we hypothesized that dysfunctional dimensions of attachment would be associated with dysfunctional defensive styles. Similarly, functional attachment dimensions would be associated with adaptive defense mechanisms. We also expect problematic eating behaviors to have a direct relationship with attachment dimensions.

## Material and Methods

### *Study design*

The present study was designed as cross-sectional, according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (von Elm et al., 2007).

### *Participants*

Subjects were volunteers and were recruited by soliciting local associations and organisations, psychology students and the researchers' acquaintances. The sample consisted of 284 Caucasian community-dwellers (251 females, 33 males), aged from 18 to 49 years old (mean age:  $22.3 \pm 4.81$ ); the majority of subjects had a high school education (77%), and were students (77%); 17% of subjects were employees, 2% were housewives. Each subject was of Italian nationality and lived in the south of Italy. Participants were excluded from the study if they reported to suffer from any health condition that might independently affect appetite, or might require medication that alters food intake.

### *Measures and procedure*

The Italian version of the *Attachment Style Questionnaire (ASQ)* was used to evaluate attachment relationships (Fossati et al., 2003). The ASQ is a 40-item questionnaire with a response system based on a 6-point Likert-type scale, ranging from 1 (total disagree) to 6 (totally agree).

The questionnaire explores the following five attachment factors: Confidence (e.g. "I feel confident that other people will be there for me when I need them"), Discomfort with Closeness (e.g. "I prefer to depend on myself rather than other people"), Need for Approval (e.g. "I wonder why people would want to be involved with me"), Preoccupation with Relationship (e.g. "I often feel left out or alone"), and Relationship as Secondary (e.g. "To ask for help is to admit that you are a failure"). The ASQ was widely used in several studies (Fossati et al., 2003; Axfors et al., 2017) and has shown good psychometric properties. As shown in **table 1**, the internal consistency of the five factors was adequate.

Defense mechanisms were explored through the Italian version of the *Defense Style Questionnaire (DSQ)* (San Martini et al., 2004). DSQ is a self-report 88-item questionnaire commonly used to evaluate conscious manifestations of defense mechanisms. The response system is based on a 9-point Likert-type scale. The questionnaire investigates the following four

**Table 1.** Descriptive analyses and correlations

	M	SD	Skew	Kurt	$\alpha$	1	2	3	4	5	6	7	8	9
1. Confidence	32.05	6.47	-1.47	5.24	.72									
2. Discomfort with Closeness	36.25	7.9	-1.04	3.48	.69	-.40**								
3. Relationships as Secondary	14.07	5.2	.50	.75	.76	-.20**	.33**							
4. Need for Approval	18.33	6.44	.19	.11	.78	-.28**	.35**	.50**						
5. Preoccupation with Relationships	26.93	7.49	-.49	1.09	.77	-.23**	.37**	.25**	.60**					
6. Maladaptive Style	3.82	.92	.16	.09	.81	-.41**	.38**	.34**	.53**	.53**				
7. Image – distorting Style	4.09	1.14	.21	-.14	.64	-.06	.27**	.25**	.19**	.20**	.51**			
8. Adaptive Style	4.99	1.39	0.33	2.61	.58	.04	-.03	-.02	-.02	-.06	.18**	.17**		
9. General Psychological Maladjustment	52.37	24.67	1.23	2.15	.90	-.48**	.41**	.33**	.49**	.45**	.63**	.27**	-.05	
10. Eating Disorder Risk	26.84	18.37	.85	0.22	.92	-.17**	.18**	.18**	.21**	.25**	.30**	.07	-.06	.53**

Note: \*\*  $p < .01$ .

defense patterns: Maladaptive style, Image-distorting style, Adaptive style and Self-sacrificing style. For the current study, to reduce the potential burden related to the compilation of the entire protocol, only the first three subscales described above have been used. The DSQ in its various versions was widely used in several studies (Ruuttu et al., 2006; Di Giuseppe et al., 2018; Karagiannopoulou et al., 2018), and in the present study internal consistency values are in line with the ones reported in the Italian validation (San Martini et al., 2004). Particularly, as shown in **table 1**, internal consistency for the maladaptive style was satisfactory, which is in line with previous findings that showed that maladaptive style dimension was highly reliable (San Martini et al., 2004; Hyphantis, 2010).

The *Eating Disorder Inventory-3 (EDI-3)* is a self-report 91-item questionnaire and it was used to assess EDs symptoms (Giannini et al., 2008). The questionnaire explores nine psychological domains involved in EDs: low self-esteem (LSE), personal alienation (PA), interpersonal insecurity (II), interpersonal alienation (IA), interceptive deficits (ID), emotional dysregulation (ED), perfectionism (P), asceticism (AS) and maturity fear (MF). For the present study, we only accounted the scores of two subscales of the questionnaire, the Eating Disorder Risk scale (EDR) and the General Psychological Maladjustment scale (GPM). The first describes a global measure of eating concerns, food intake and body evaluation; the latter describes the psychological maladjustment related to EDs-related behaviors (e.g. “I feel extremely guilty after eating too much.”). The EDI-3 was widely used in several studies (Cumella, 2006), and it has shown good psychometric properties. **Table 1** shows excellent Cronbach’s alpha scores for both EDR and GPM.

The study was conducted in accordance with the 1964 Declaration of Helsinki and its later amendments; signed informed consent was collected for each subject. The entire evaluation protocol took about 30 min to be completed, and it was carried out in the presence of trained psychologists. The study was approved by the Research Ethics Committee for Psychological Research of the University of Messina (n. 93120).

## Statistical analyses

The data were analysed using IBM SPSS v.22 and R statistical software. Pearson’s correlation analysis was performed to measure the degree of correlations between variables. Path-analysis was used to examine the relationship between the included variables. In this tested model, GPM and EDR are considered the main outcomes, whereas attachment factors are considered the predictor variables; defense styles are considered as potential mediators. Analysis of the covariance matrices was conducted using R and solutions were generated based on maximum-likelihood estimation. Values of  $p < .05$  and  $p < .01$  were considered statistically significant.

## Results

### Descriptive results and correlations

For each variable, means, standard deviations, skewness and kurtosis are shown in **table 1**. Furthermore, **table 1** illustrates the correlations between the dimensions of the questionnaires.

### Summary of the tested model

Path analysis was conducted to test a model in which attachment dimensions (i.e., Confidence, Discomfort with Closeness, Relationship as Secondary, Need for Approval and Preoccupation with Relationships) were considered as the predictor variables. The model also accounted the defence mechanisms (i.e., Maladaptive Style, Image-distorting style, Self-sacrificing style and Adaptive style) as potential mediators; GPM and EDR were considered as the outcome; age and gender were included in the model as covariates.

### Full regression model including Attachment, Defence Mechanisms, and EDs

The estimation of the full regression model was

initially performed through a saturated model with a perfect fit. Moreover, estimation of the saturated model showed significant paths from Confidence to Maladaptive Style ( $\beta = -.24; p < .05$ ), GPM ( $\beta = -.22; p < .05$ ) and EDR ( $\beta = -.12; p < .05$ ). Significant paths were also found from Relationship as Secondary to Maladaptive Style ( $\beta = .21; p < .05$ ) and Image Distorting Style ( $\beta = .18; p < .05$ ). In addition, a significant path was found from Discomfort with Closeness to Image Distorting Style ( $\beta = .20; p < .05$ ). Finally, a significant path was found from Preoccupation with Relationship to Maladaptive Style ( $\beta = .28; p < .05$ ).

### Mediation models including indirect effects

We used the bootstrap-generated bias-corrected confidence interval approach (Preacher & Hayes, 2004; Shrout & Bolger, 2002) to explore the significance of emerged indirect effects (i.e., drop from the total to direct effect).

Accordingly, Confidence was indirectly associated with GPM ( $\beta = -.10; p < .05$ ) and EDR ( $\beta = -.11; p < .05$ ) through the effect of Maladaptive Style. Moreover, Need for Approval was indirectly associated with GPM ( $\beta = .09; p < .05$ ) and EDR ( $\beta = .10; p < .05$ ) through the effect of Maladaptive Style. Additionally, Preoccupation with Relationships was indirectly associated with GPM ( $\beta = .12; p < .05$ ) and EDR ( $\beta = .14; p < .05$ ) through the effect of Maladaptive Style.

### Mediation models after removing non-significant paths

In line with the common procedure to test the saturated model (Kline, 2011), each non-significant path was removed, and several indices indicated that the data fit the final model:  $\chi^2(19) = 62.12; p = .07$ , SRMR = .05, CFI = .96, RMSEA = .04 (90% CI = .00 – .06) (figure 1).

Similar to the saturated model, the results showed significant paths from Confidence to Maladaptive Style ( $\beta = -.30; p < .05$ ), GPM ( $\beta = -.26; p < .05$ ) and EDR ( $\beta = -.14; p < .05$ ). Moreover, a significant path was found from Discomfort with Closeness to Image Distorting Style ( $\beta = .23; p < .05$ ). Additional significant paths were found from Need for Approval to Maladaptive Style ( $\beta = .26; p < .05$ ), and from Preoccupation with Relationships to Maladaptive Style ( $\beta = .26; p < .05$ ). Further significant paths were found between Maladaptive Style to GPM ( $\beta = .54; p < .05$ ) and EDR ( $\beta = .46; p < .05$ ), and between Adaptive Style to GPM ( $\beta = -.11; p < .05$ ).

The results showed that Confidence was indirectly associated with GPM ( $\beta = -.16; p < .05$ ) and EDR ( $\beta = -.14; p < .05$ ) through the effect of Maladaptive Style. Furthermore, Preoccupation with Relationships was indirectly associated with GPM ( $\beta = .14; p < .05$ ) and EDR ( $\beta = .12; p < .05$ ) through the effect of Maladaptive Style. Eventually, Need for Approval was indirectly associated with GPM ( $\beta = .14; p < .05$ ) and EDR ( $\beta = .12; p < .05$ ) through the effect of Maladaptive Style.

## Discussion

The purpose of this study was to explore the shared associations between attachment styles, defense mechanisms and EDs-related symptoms; additionally, we tested the hypothesis that defense mechanisms might be a potential mediator in the association between

attachment styles and EDs.

EDs represent a relevant clinical condition, which may expose those who suffer from it to a high risk of negative outcomes, such as complications related to the malnutrition, even including mortality (Balbo et al., 2017). The multidimensional nature of the symptoms makes it a difficult condition to manage, also due to the occurring presence of peculiar frontal dysfunctions (Ciberti et al., 2020), and the adoption of a psychopharmacological approach is increasingly encouraged (Martiadis et al., 2007).

In our study, several associations between attachment styles and defense mechanisms have been highlighted, consistently with previous observations showing the presence of maladaptive defense mechanisms in subjects with insecure attachment styles (McMahon et al., 2005; Besharat & Khajavi, 2013; Laczkovics et al., 2018; Lenzo et al., 2020a).

In line with this evidence, an insecure attachment might increase the internalization of dysfunctional interpersonal patterns, which can lead an individual to reinforce a distorted self-image to protect the self (Tasca et al., 2005). For instance, the perception of others as not reliable often worsens distressful situations even in the context of close relationships (Cramer & Kelly, 2010). On the other hand, our study showed that Confidence, which is a key feature of a secure attachment, was negatively associated with EDR. This evidence supports the idea that the longstanding emotional bond between individuals allows for functional strategies to self-regulate emotions (Faber et al., 2018), thus reducing the odds of engaging eating disorders as a way to handle distressing states.

It is broadly known that internal working models of attachment that originate in early childhood may affect adjustment processes during adulthood (O'Shaughnessy & Dallos, 2009; Kuipers & Bekker, 2012; Lenzo et al., 2021). Therefore, insecure attachment styles could make individuals vulnerable to EDs by leading them to use non-adaptive strategies to keep emotions under control (Del Vecchio et al., 2014; Tasca, 2019).

In this regard, EDs symptoms appear linked not only to attachment experience, but also to specific defense strategies, which are strongly connected to attachment styles, and are implemented to manage distressing emotions (Besharat & Khajavi, 2013). Interestingly, our result showed a significant path between Discomfort with Closeness and Image Distorting Style. This evidence suggests that the difficulty in sharing feelings and the consequent reduced social interactions would make individuals more inclined to split the image of themselves and others into good or bad, due to the prolonged sense of social alienation, in order to preserve their inner identity (Bond, 1983), which could lead to the inability to develop mature relationships.

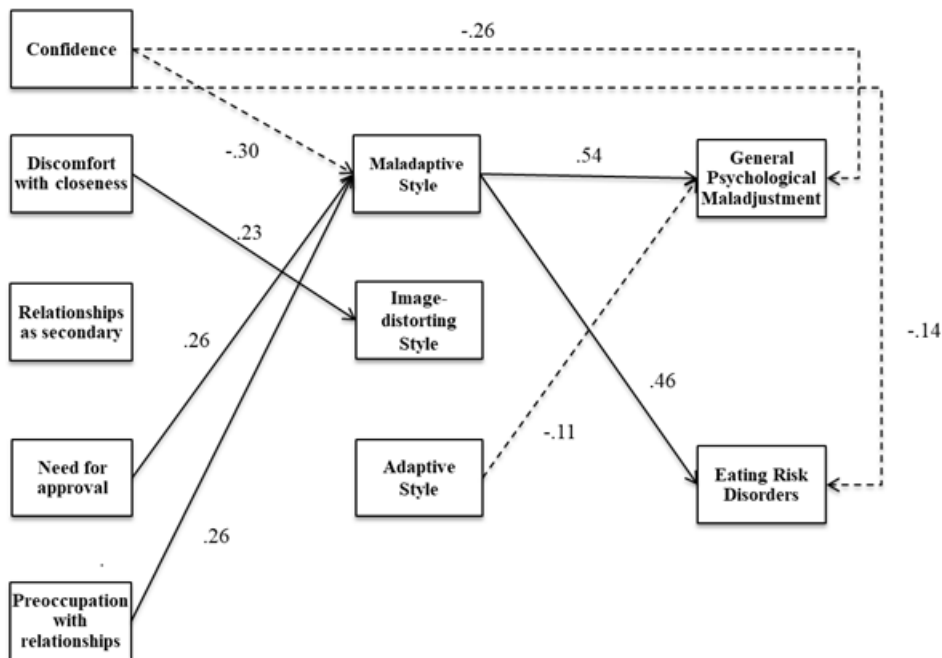
As expected, our study showed a significant role of defense mechanisms in mediating the relationship between attachment styles and EDs-related symptoms. Defense mechanisms appear strongly linked to the processes of emotion regulation and psychological distress (Conversano et al., 2020; Di Pierro et al., 2015); indeed, defense mechanisms can be considered as automatic protective reactions to potentially negative or stressful events; therefore, they can modulate the flexibility of individual responses to the environment (Prout et al., 2019). The clinical relevance of defense mechanisms has been further supported, suggesting that an increased use of immature defensive mechanisms, as well as a reduced use of mature defensive mechanisms, might have a negative impact on the development of personality (Granieri et al., 2017).

**Table 2.** Path estimates, SEs and 95% CIs of the non-saturated model.

	$\beta$	SE	Lower bound (BC) 95% CI	Upper bound (BC) 95% CI
<i>Direct Effect</i>				
Confidence→Maladaptive Style	-.30	.01	-.06	-.03
Need for Approval→Maladaptive Style	.26	.01	.02	.05
Preoccupation with Relationship→Maladaptive Style	.26	.01	.01	.04
Confidence→Image-distorting Style	.03	.01	-.02	.03
Discomfort with Closeness→Image-distorting Style	.23	.01	.02	.05
Maladaptive Style→General Psychological Maladjustment	.54	1.52	11.37	17.34
Adaptive Style→General Psychological Maladjustment	-.11	.71	-3.45	-.59
Confidence→General Psychological Maladjustment	-.26	.23	-1.55	-.65
Maladaptive Style→Eating Disorder Risk	.46	.38	1.90	3.37
Confidence→Eating Disorder Risk	-.14	.06	-.25	-.02
<i>Indirect effect via Maladaptive Style</i>				
Confidence→General Psychological Maladjustment	-.16	.13	-.92	-.41
Need for Approval→General Psychological Maladjustment	.14	.14	.30	.83
Preoccupation with Relationship→General Psychological Maladjustment	.14	.12	.25	.74
Confidence→Eating Disorder Risk	-.14	-.12	-.18	-.07
Need for Approval→Eating Disorder Risk	.12	.03	.05	.16
Preoccupation with Relationship→Eating Disorder Risk	.12	.02	.05	.14

Note: SE = standards errors; BC 95% CI = Bias Corrected-Confidence Interval.

**Figure 1.** Mediation model between attachment, defense mechanism and eating disorders



A further evidence highlighted by our study was the interesting association between Need for Approval and the General Psychological Maladjustment scale, which was mediated by Maladaptive Style; this result suggests that individuals who perceive a greater need for approval likely are more vulnerable, they adopt dysfunctional defense mechanisms and

consequently may exhibit high levels of psychological maladjustment in the context of EDs-related behaviors. The constant seeking for approval decreases individual self-evaluation and may not allow the development of adequate strategies to keep distress under control, leading to reduced social relationships (DeMarco & Newheiser, 2018). The concomitant presence of Need

for Approval and dysfunctional defense mechanisms is also consistent with previous evidence (Prunas et al., 2019), and additionally might suggest a potential pre-morbid pattern involved even in EDs.

Furthermore, Maladaptive Style mediated also the relation between Preoccupation with Relationships and EDs-related-outcomes. The prolonged need for confirmation and relational inclusion by others promotes an increased need for ways to manage attachment relationships (Stein et al., 2002). Consequently, this may be translated into maladaptive strategies to manage unpleasant states and efforts to avoid conflicts, which in turn increases the likelihood of developing difficulties in regulating emotions, thus predisposing individuals to EDs-type issues (Vidovic et al., 2003).

### Limitations and future implications

Despite the challenging topic that was explored, the study presents limitations. Firstly, the relatively small sample size may preclude the generalizability of the results. Moreover, we did not account the different types of EDs, but we focused only on the presence of common EDs-related symptoms in community population. Eventually, the cross-sectional design did not allow drawing causal relationships between the variables. The use of dysfunctional defense mechanisms by people with EDs-related symptoms might represent either the impact of an ongoing disease that influences individual global adjustment, or a potentially premorbid risk factor for the onset of the disease itself (Stein et al., 2003).

However, this study provides potentially significant clinical insights. Previous researches have already pointed out the relevance of personality factors in the onset and maintenance of emotional disorders (Barberis et al., 2020; Lenzo et al., 2020b, 2020c, 2020d; Martino, et al., 2019; Quattropani et al., 2018, 2019). Consistently, our results highlighted that individuals who exhibit EDs-related symptoms also show dysfunctional attachment styles and immature defense mechanisms. Furthermore, since defense processes appear to be a significant mediator of the association between attachment styles and EDs, reinforcing effective and adaptive defense mechanisms could be considered an additional aim of group therapies involving subjects with EDs (Downey, 2014).

Because there is a growing interest for the psychological factors involved in chronic medical (Sardella et al., 2021), the understanding of attachment styles and defense mechanisms and their relationships with Eds could also increase the efficacy of interventions promoting healthy eating-related behaviors (Hill et al., 2015; Tasca et al., 2018). In this regard, future interventions may try to integrate some relevant variables derived from the psychoanalytic tradition that are empirically relevant in the context of attachment, in order to provide more tailored interventions.

### Conclusion

The present study described shared associations between attachment styles, defense mechanisms and EDs. A specific cluster of defense mechanisms, namely Maladaptive Style, appeared to be a significant mediator of the association between attachment styles and EDs-related symptoms.

The integrated evaluation of attachment and defense mechanisms could help provide a more comprehensive framework of the psychological antecedents of EDs. Along with a deeper comprehension of the

psychological antecedents, our findings might also be relevant for increasing the efficacy of psychological interventions for people suffering from Eds.

### References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders; 5th ed.* Authors, Washington, DC.
- Andrews, G., Singh, M., & Bond, M. (1993). The Defense Style Questionnaire. *Journal of Nervous and Mental Disease, 181(4)*, 246-256. Doi: 10.1097/00005053-199304000-00006.
- Arcelus, J., Yates, A., & Whiteley, R. (2012). Romantic relationships, clinical and sub-clinical eating disorders: A review of the literature. *Sexual and Relationship Therapy, 27(2)*, 147-161. Doi: 10.1080/14681994.2012.696095.
- Axfors, C., Sylvén, S., Skalkidou, A., & Ramklint, M. (2017). Psychometric properties of the attachment style questionnaire in Swedish pregnant women: short and full versions. *Journal of Reproductive and Infant Psychology, 35(5)*, 450-461. Doi:10.1080/02646838.2017.1342786.
- Balbo, M., Zaccagnino, M., Cussino, M., & Civilotti, C. (2017). Eye Movement Desensitization and Reprocessing (EMDR) and eating disorders: a systematic review. *Clinical Neuropsychiatry, 14(5)*, 321-329.
- Barberis, N., Costa, S., Cuzzocrea, F., & Quattropani, M. C. (2018). Trait EI in the relationship between needs fulfilment and symptoms and attitudes associated with EDs. *Mental Health & Prevention, 10*, 50-55. Doi: 10.1016/j.mhp.2018.01.003.
- Barberis, N., Verrastro, V., Papa, F., & Quattropani, M. C. (2020). Suicidal ideation and psychological control in emerging adults: The role of trait EI. *Maltrattamento e Abuso all'Infanzia, 2*, 13-28. Doi: 10.3280/MAL2020-002002.
- Besharat, M. A., & Khajavi, Z. (2013). The relationship between attachment styles and alexithymia: Mediating role of defense mechanisms. *Asian Journal of Psychiatry, 6(6)*, 571-576. Doi: 10.1016/j.ajp.2013.09.003.
- Blaase, H., & Elklit, A. (2001). Psychological characteristics of women with eating disorders: Permanent or transient features? *Scandinavian Journal of Psychology, 42(5)*, 467-478. Doi: 10.1111/1467-9450.00260.
- Bond, M. (1983). Empirical Study of Self-rated Defense Styles. *Archives of General Psychiatry, 40(3)*, 333. Doi:10.1001/archpsyc.1983.01790030103013.
- Bowlby, J. (1969). *Attachment and loss, Vol. 1: Attachment.* New York: Basic Books.
- Cooke, J. E., Stuart-Parrigon, K. L., Movahed-Abtahi, M., Koehn, A. J., & Kerns, K. A. (2016). Children's emotion understanding and mother-child attachment: A meta-analysis. *Emotion, 16(8)*, 1102-1106.
- Ciberti, A., Cavalletti, M., Palagini, L., Giorgi Mariani, M., Dell'Osso, L., Mauri, M., ... Miniati, M. (2020). Decision-making, impulsiveness and temperamental traits in eating disorders. *Clinical Neuropsychiatry, 17(4)*, 199-208. Doi. org/10.36131/cnforitieditore20200401.
- Conversano, C., Di Giuseppe, M., Miccoli, M., Ciacchini, R., Di Silvestre, A., Lo Sterzo, R., ... Orrù, G. (2020). Retrospective analyses of psychological distress and defense style among cancer patients. *Clinical Neuropsychiatry, 17(4)*:217-224. Doi: 10.36131/cnforitieditore20200403.
- Cortés-García, L., Takkouche, B., Seoane, G., & Senra, C. (2019). Mediators linking insecure attachment to eating symptoms: A systematic review and meta-analysis. *PLoS one, 14(3)*, e0213099. Doi: 10.1371/journal.pone.0213099.
- Cramer, P. (1991). *The development of defence mechanisms.*

- New York: Springer.
- Cramer, P., & Kelly, F. D. (2010). Attachment Style and Defence Mechanisms in Parents Who Abuse their Children. *The Journal of Nervous and Mental Disease*, 198(9), 619–627. Doi: 10.1097/nmd.0b013e3181ef3ee1.
- Cumella, E. J. (2006). Review of the Eating Disorder Inventory–3. *Journal of Personality Assessment*, 87(1), 116–117. Doi: 10.1207/s15327752jpa8701\_11.
- Dakanalis, A., Clerici, M., & Carrà, G. (2015). Narcissistic Vulnerability and Grandiosity as Mediators Between Insecure Attachment and Future Eating Disordered Behaviors: A Prospective Analysis of Over 2,000 Freshmen. *Journal of Clinical Psychology*, 72(3), 279–292. Doi: 10.1002/jclp.22237.
- Delvecchio, E., Di Riso, D., Salcuni, S., Lis, A., & George, C. (2014). Anorexia and attachment: dysregulated defense and pathological mourning. *Frontiers in psychology*, 5, 1218. Doi: 10.3389/fpsyg.2014.01218.
- DeMarco, T. C., & Newheiser, A. K. (2018). Attachment to groups: Relationships with group esteem, self-esteem, and investment in ingroups. *European Journal of Social Psychology*, 49(1), 63–75. Doi: 10.1002/ejsp.2500.
- Dicé F., Santaniello A., Gerardi F., Menna L. F. & Freda M. F. (2017). Meeting the Emotion! Application of the Federico II Model for Pet Therapy to an experience of Animal Assisted Education (AAE) in a primary school. *Pratiques Psychologiques*, 23:445-63 DOI: 10.1016/j.prps.2017.03.001
- Di Giuseppe, M., Ciacchini, R., Micheloni, T., Bertolucci, I., Marchi, L., & Conversano, C. (2018). Defense mechanisms in cancer patients: a systematic review. *Journal of psychosomatic research*, 115, 76–86. Doi:10.1016/j.jpsychores.2018.10.016.
- Di Pierro, R., Benzi, I. M. A., & Madeddu, F. (2015). Difficulties in emotion regulation among inpatients with substance use disorders: The mediating effect of mature defenses mechanisms. *Clinical Neuropsychiatry*, 12(4), 83–89.
- Downey, J. (2014). Group Therapy for Adolescents Living With an Eating Disorder: A Scoping Review. *SAGE Open*, 4(3). Doi: 10.1177/2158244014550618.
- Faber, A., Dubé, L., & Knäuper, B. (2018). Attachment and eating: A meta-analytic review of the relevance of attachment for unhealthy and healthy eating behaviors in the general population. *Appetite*, 123, 410–438. Doi: 10.1016/j.appet.2017.10.043.
- Ferriter, C., Eberhart, N. K., & Hammen, C. L. (2010). Depressive Symptoms and Social Functioning in Peer Relationships as Predictors of Eating Pathology in the Transition to Adulthood. *Journal of Social and Clinical Psychology*, 29(2), 202–227. Doi:10.1521/jscp.2010.29.2.202.
- Fossati, A., Fenney, J. A., Donati, D., Domini, N., Novella, L., Bagnato, M., Acquarini, E., & Maffei, C. (2003). On the dimensionality of the Attachment Style Questionnaire in Italian clinical and nonclinical participants. *Journal of Social Personal Relationships*, 20(1), 50–79. Doi: 10.1177/02654075030201003.
- Freda, M. F., & Dicé, F. (2017). Una proposta di formazione per promuovere il dialogo in pediatria di base. Lo Scaffolding Psicologico alla Relazione Sanitaria. *Quaderni ACP*, 3, 130-132.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 52(3), 511–524. Doi:10.1037/0022-3514.52.3.511.
- Hill, R., Tasca, G. A., Presniak, M., Francis, K., Palardy, M., Grenon, R., Mcquaid, N., Hayden, G., Gick, M., & Bissada, H. (2015). Changes in Defence Mechanism Functioning During Group Therapy for Binge-Eating Disorder. *Psychiatry*, 78, 75–88. Doi: 10.1037/e649092013-002.
- Hilsenroth, M. J., Callahan, K. L., & Eudell, E. M. (2003). Further Reliability, Convergent and Discriminant Validity of Overall Defensive Functioning. *The Journal of Nervous and Mental Disease*, 191(11), 730–737. Doi:10.1097/01.nmd.0000095125.92493.e8.
- Hyphantis, T. (2010). The Greek version of the Defense Style Questionnaire: psychometric properties in three different samples. *Comprehensive Psychiatry*, 51(6), 618–629. doi:10.1016/j.comppsy.2010.03.005.
- Hricova, L., Orosova, O., & Bacikova-Sleskova, M. (2018). Disordered eating in the context of Self-determination theory. *Current Psychology*, 39, 608–617. Doi: 10.1007/s12144-018-9782-1.
- Giannini, M., Pannocchia, L., Dalle Grave, R., & Muratori, F. (2008). Adattamento italiano dell'EDI-3. *Eating Disorder Inventory-3*. Giunti O.S. Firenze: Organizzazioni Speciali.
- Gonçalves, S., Vieira, A. I., Rodrigues, T., Machado, P. P., Brandão, I., Timóteo, S. ... Machado, B. (2019). Adult attachment in eating disorders mediates the association between perceived invalidating childhood environments and eating psychopathology. *Current Psychology*. Doi: 10.1007/s12144-019-00524-2.
- Granieri, A., La Marca, L., Mannino, G., Giunta, S., Guglielmucci, F., & Schimmenti, A. (2017). The Relationship between Defense Patterns and DSM-5 Maladaptive Personality Domains. *Frontiers in psychology*, 8, 1926. <https://doi.org/10.3389/fpsyg.2017.01926>.
- Karagiannopoulou, E., Milienos, F. S., & Athanasopoulos, V. (2018). Associations Between Defense Styles, Approaches to Learning, and Achievement Among University Students. *Frontiers in Education*, 3. Doi:10.3389/educ.2018.00053.
- Khademi, M., Hajiahmadi, M., & Faramarzi, M. (2019). The role of long-term psychodynamic psychotherapy in improving attachment patterns, defense styles, and alexithymia in patients with depressive/anxiety disorders. *Trends in psychiatry and psychotherapy*, 41(1), 43–50. Doi: 10.1590/2237-6089-2017-0144.
- Kuipers, G. S., & Bekker, M. H. J. (2012). Attachment, mentalization and eating disorders: A review of studies using the Adult Attachment Interview. *Current Psychiatry Reviews*, 8(4), 326-336. Doi: 10.2174/157340012803520478.
- Kuipers, G. S., van Loenhout, Z., van der Ark, L. A., & Bekker, M. H. J. (2016). Attachment insecurity, mentalization and their relation to symptoms in eating disorder patients. *Attachment & Human Development*, 18(3), 250–272. Doi :10.1080/14616734.2015.1136660.
- Laczkovics, C., Fonzo, G., Bendixsen, B., Shpigel, E., Lee, I., Ramskogler, K., Prunas, A., Gross, J., Steiner, H., & Huemer, J. (2018). Defense mechanism is predicted by attachment and mediates the maladaptive influence of insecure attachment on adolescent mental health. *Current Psychology*, 39, 1388–1396. Doi: 10.1007/s12144-018-9839-1.
- Lenzo, V., Barberis, N., Cannavò, M., Filastro, A., Verrastro, V., & Quattropani, M. C. (2020a). The relationship between alexithymia, defense mechanisms, eating disorders, anxiety and depression. *Rivista di Psichiatria*, 55(1), 24-30. Doi: 10.1708/3301.32715.
- Lenzo, V., Sardella, A., Martino, G., & Quattropani, M. C. (2020b). A systematic review of metacognitive beliefs in chronic medical conditions. *Frontiers in Psychology*, 10, 2875. Doi: 10.3389/fpsyg.2019.02875.
- Lenzo, V., Sardella, A., La Foresta, S., Faraone, C., Russo, M., Vita, G. L., ... Quattropani, M. C. (2020c). The role of metacognitive beliefs on anxiety and depression among amyotrophic lateral sclerosis caregivers. *Life Span and Disability*, 23(1), 109-131.

- Lenzo, V., Quattropiani, M. C., Musetti, A., Zenesini, C., Freda, M. F., Lemmo, D., ... Franceschini, C. (2020d). Resilience Contributes to Low Emotional Impact of the COVID-19 Outbreak Among the General Population in Italy. *Frontiers in psychology*, *11*, 576485. Doi: 10.3389/fpsyg.2020.576485.
- Lenzo, V., Sardella, A., Maisano Branca, G., Bordino, V., Aragona, M., Garipoli, C., ... Quattropiani, M. C. (2021). The interplay between burnout risk and attachment styles among palliative care practitioners. *Psychodynamic Practice*. Doi: 10.1080/14753634.2021.1922305
- Lindblom, J., Punamaki, L. R., Flykt, M., Vanska, M., Nummi, T., Sinkkonen, J., Tiitinen, A., & Tulppala, M. (2016). Early Family Relationships Predict Children's Emotion Regulation and Defense Mechanisms. *SAGE Open*, 1–18. Doi: 10.1177/2158244016681393.
- Martiadis, V., Castaldo, E., Monteleone, P., & Maj, M. (2007). The role of psychopharmacotherapy in the treatment of eating disorders. *Clinical Neuropsychiatry*, *4*, 2, 51-60.
- Martino, M. L., Gargiulo, A., Lemmo, D., Dolce, P., Barberio, D., Abate, V., Avino, F., & Tortoriello, R. (2019). Longitudinal effect of emotional processing on psychological symptoms in women under 50 with breast cancer. *Health Psychology Open*, *6*(1), 2055102919844501. Doi: 10.1177/2055102919844501.
- McMahon, C., Barnett, B., Kowalenko, N., & Tennant, C. (2005). Psychological factors associated with persistent postnatal depression: past and current relationships, defense styles and the mediating role of insecure attachment style. *Journal of Affective Disorders*, *84*(1), 15–24. Doi: 10.1016/j.jad.2004.05.005.
- O'Shaughnessy, R., & Dallos, R. (2009). Attachment research and eating disorders: A review of the literature. *Clinical Child Psychology and Psychiatry*, *14*(4), 559-574. Doi: 10.1177/1359104509339082.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731. Doi: 10.3758/bf03206553.
- Poikolainen, K., Kanerva, R., Marttunen, M., & Lönnqvist, J. (2001). Defence styles and other risk factors for eating disorders among female adolescents: A case-control study. *European Eating Disorders Review*, *9*(5), 325-334. Doi: 10.1002/erv.407.
- Prout, T. A., Malone, A., Rice, T., & Hoffman, L. (2019). Resilience, Defence Mechanisms, and Implicit Emotion Regulation in Psychodynamic Child Psychotherapy. *Journal of Contemporary Psychotherapy*, *49*, 235–244. Doi: 10.1007/s10879-019-09423-w.
- Prunas, A., Di Pierro, R., Huemer, J., & Tagini, A. (2019). Defense Mechanisms, Remembered Parental Caregiving, and Adult Attachment Style. *Psychoanalytic Psychology*, *36*(1), 64-72. Doi: 10.1037/pap0000158.
- Quattropiani, M. C., Lenzo, V., Filastro, A., & Fries, W. (2019). Metacognitions and basic emotions in patients with irritable bowel syndrome and inflammatory bowel syndrome. *Psicoterapia Cognitiva e Comportamentale*, *25*(1), 35-51.
- Quattropiani, M. C., La Foresta, S., Russo, M., Faraone, C., Pistorino, G., Lenzo, V., Lizio, A., Marconi, A., Vita, G. L., Sframeli, M., Di Stefano, M. G., Sansone, V., Vita, G., Lunetta, C., & Messina, S. (2018). Emotional burden and coping strategies in amyotrophic lateral sclerosis caregivers: The role of metacognitions. *Minerva Psichiatrica*, *59*, 95–104.
- Ruutu, T., Pelkonen, M., Holli, M., Karlsson, L., Kiviruusu, O., Heilä, H., Tuisku, V., Tuulio-Henriksson, A., & Marttunen, M. (2006). Psychometric properties of the defense style questionnaire (DSQ-40) in adolescents. *The Journal of Nervous and Mental Disease*, *194*(2), 98–105. Doi: 10.1097/01.nmd.0000198141.88926.2e.
- Sardella, A., Lenzo, V., Bonanno, G. A., Martino, G., Basile, G., & Quattropiani, M. C. (2021). Dispositional Optimism and Context Sensitivity: Psychological contributors to frailty status among elderly outpatients. *Frontiers in Psychology*, *11*:621013. Doi: 10.3389/fpsyg.2020.621013.
- San Martini, P., Roma, P., Sarti, S., Lingiardi, V., & Bond, M. (2004). Italian Version of the Defence Style Questionnaire. *Comprehensive Psychiatry*, *45*(6), 483-496. Doi: 10.1016/j.comppsy.2004.07.012.
- Shaver, P. R., & Mikulincer, M. (2008). Adult Attachment and Cognitive and Affective Reactions to Positive and Negative Events. *Social and Personality Psychology Compass*, *2*(5), 1844–1865. Doi: 10.1111/j.1751-9004.2008.00146.x.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*(4), 422–445. Doi: 10.1037/1082-989x.7.4.422.
- Stein, H., Koontz, A. D., Fonagy, P., Allen, J. G., Fultz, J., Brethour, J. R., ... Evans, R. B. (2002). Adult attachment: What are the underlying dimensions? *Psychology and Psychotherapy: Theory, Research and Practice*, *75*(1), 77–91. Doi: 10.1348/147608302169562.
- Stein, D., Bronstein, Y., & Weizman, A. (2003). Defense Mechanisms in a Community-Based Sample of Female Adolescents with Partial Eating Disorders. *The International Journal of Psychiatry in Medicine*, *33*(4), 343–355. Doi: 10.2190/jec0-b7pf-tvnp-ljeu.
- Tasca, G. A. (2019). Attachment and eating disorders: a research update. *Current opinion in Psychology*, *25*, 59–64. Doi: 10.1016/j.copsyc.2018.03.003.
- Tasca G. A., Brugnera, A., Baldwin, D., Carlucci, S., Compare, A., Balfour, L., Proulx, G., Gick, M., Lafontaine, M. F. (2018). Reliability and validity of the experiences in close relationships scale-12: attachment dimensions in a clinical sample with eating disorders. *International Journal of Eating Disorders*, *51*, 18-27. Doi: 10.1016/j.copsyc.2018.03.003.
- Tasca, G. A., Mikail, F. S., & Hewitt, L. P. (2005). Group psychodynamic interpersonal psychotherapy: Summary of a treatment model and outcomes for depressive symptoms. In M. E. Abelian (Ed.), *Focus on psychotherapy research* (pp.159–188). New York, NY: Nova.
- Troisi, A., Massaroni, P., & Cuzzolaro, M. (2005). Early separation anxiety and adult attachment style in women with eating disorders. *British Journal of Clinical Psychology*, *44*(1), 89–97. Doi: 10.1348/014466504x20053.
- Vidovic V., Henigsberg N., & Vesna J. (2003). Anxiety and Defense Styles in Eating Disorders. *Collegium antropologicum*, *27* (1), 125-34.
- von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., Vandenbroucke, J. P., STROBE Initiative. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *PLoS Med*, *4*(10): e296. Doi: 10.1371/journal.pmed.0040296.
- World Medical Association (2013). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*, *310*(20), 2191–2194. Doi: 10.1001/jama.2013.281053