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## **Emotion regulation and empathic abilities in young adults: The role of attachment styles**

Sébastien Henschel PhD<sup>1</sup>, Jean-Louis Nandrino

Prof<sup>1,2</sup>, Karyn Doba PhD<sup>1,2</sup>

1. Univ. Lille, CNRS, UMR 9193 –SCALAb, Sciences  
Cognitives et Sciences Affectives, F-59000 Lille,  
France
2. Fondation Santé des Etudiants de France, Clinique  
médico-psychologique, F-59653 Villeneuve d’Ascq,  
France

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Correspondence concerning this article should be addressed to Karyn Doba, University of Lille North of France, Laboratory SCALAB UMR CNRS 9193, Department of Psychology, B.P. 60149, FRANCE. Email: [karyn.doba@univ-lille.fr](mailto:karyn.doba@univ-lille.fr); phone number: +33663429485.

Other authors addresses:

Sébastien Henschel: University of Lille North of France, Laboratory SCALAB UMR CNRS 9193, Department of Psychology, B.P. 60149, FRANCE; E-mail:

sebastien.henschel@univ-lille3.fr

Jean-Louis Nandrino: University of Lille North of France,

Laboratory SCALAB UMR CNRS 9193, Department of

Psychology, B.P. 60149, FRANCE; E-mail: jean-

louis.nandrino@univ-lille.fr

**Abstract**

Much research has shown strong relationships between attachment security and the development of emotion regulation (ER) and empathic abilities in childhood. However, less is known about how attachment styles influence ER and empathy in adulthood. The aim of this study was to examine how differences in attachment styles influence the relationships between ER and affective and cognitive empathy in adults. From a total sample of 870 participants, 168 individuals were selected according to their specific attachment style and completed self-reports of attachment styles, ER difficulties, and affective and cognitive empathy. Concerning empathic dimensions, anxious individuals reported higher personal distress and fantasy than secure and avoidant individuals. The results also revealed that individuals with anxious attachment had higher ER difficulties than secure and avoidant individuals. Furthermore, partial least square modeling highlighted that the mediating role of ER in the relationship between attachment and empathy varied according to the attachment styles and the dimensions of empathy. This study emphasizes the role of attachment profiles and ER competences in developing cognitive and affective empathic abilities in adults.

*Keywords:* Attachment styles, emotion regulation difficulties, affective empathy, cognitive empathy.

## **1. Introduction**

### ***1.1. Attachment and empathy***

Despite the well-reported relationships between attachment security and the development of emotion regulation (ER) and empathy in childhood, less is known about how attachment styles affect ER competences and empathy in adults. A fundamental concept of attachment theory suggests that individuals' emotional experiences with primary caregivers lead to the development of secure, avoidant or anxious attachment styles in adult relationships (Ainsworth, Blehar, & Waters, 1978; Bowlby, 1988). Adults with a secure attachment style are willing to rely on others for support, comfortable with intimacy, and confident that they are valued by others (Fraley & Shaver, 2000). The anxious style is defined by insecurity concerning the responses of others together with a strong desire for intimacy and a high fear of rejection (Fraley & Shaver, 1997; Shaver & Mikulincer, 2002). The avoidant style is characterized by insecurity concerning the intentions of others, a rejection of assistance, and reduced expressions of affection and intimacy (Edelstein & Shaver, 2004; Fraley & Shaver, 1997). These different attachment styles correspond to underlying differences in the internal working models of self (such as being worthy or unworthy of support and love) and others (such as responsive or unresponsive) originating from interactions with main caregivers (Bretherton & Munholland, 2008; Cassidy, Jones, & Shaver, 2013). Child-caregiver interactions underlie the development and emergence of internal "working models" consisting of beliefs and expectations about whether the caregiver is caring and sensitive, and whether the self is worthy of attention and care (Ainsworth et al., 1978; Bowlby, 1973; Main, Kaplan, & Cassidy, 1985).

Over time, sensitive caregivers shape the empathic responses of their children. In turn, this behavioral pattern is likely to be integrated into the internal working models of secure children as a script of how to react to the distress of others (Hojat, 2007; Troyer & Greitemeyer, 2018). Empathy corresponds to the ability to understand the minds of others, to feel their

emotions outside our own, and to respond with kindness, concern and care to their emotions. It is a multidimensional construct (Davis, 1983; Decety, 2015; Decety & Meyer, 2008) encompassing an affective component (i.e. tendencies to feel compassion and concern for others) and a cognitive component (i.e. an ability to understand the reasons for another person's emotions and to imagine different viewpoints beyond one's own).

### ***1.2. Attachment, emotion regulation and empathy***

Attachment theory also suggests that the co-regulation of distress between an infant and caregivers enables the development of the self-regulation of distress, such as the ability to identify, accept, and cope effectively with negative emotions oneself (Bowlby, 1980; Stern & Cassidy, 2017). ER refers to an individual's ability to monitor, evaluate, and modulate emotional experiences according to the demands of a specific context or set of goals (Gratz & Roemer, 2004; Gross, 1998). It also includes a set of adaptive ER strategies (e.g. positive reappraisal, acceptance and planning) to modify the magnitude and/or the type of the emotional experience (Aldao, Nolen-Hoeksema, & Schweitzer, 2010; Garnefski & Kraaij, 2006). Studies have shown that individuals with ER difficulties have problems in monitoring, evaluating, and modulating emotional experiences or use maladaptive ER strategies (e.g. self-blame, other-blame, rumination, catastrophizing)(Gross, 1998; Koole, 2009). Substantial research suggests that ER abilities such as high levels of emotion recognition and understanding are central to empathic responding, enabling individuals to see, interpret, and feel the emotions of others without becoming overly distressed themselves (Eisenberg, 2000; Stern & Cassidy, 2017).

In this way, ER is thought to play a key role in understanding the link between attachment and empathy (Shaver, Mikulincer, Gross, Stern, & Cassidy, 2016; Stern & Cassidy, 2017). Recent studies have demonstrated that ER mediates the relationship between attachment security and empathy in childhood (Kim & Kochanska, 2017; Murphy, Laible, Augustine, &

Robeson, 2015; Panfile & Laible, 2012). A higher level of attachment security is associated with fewer ER difficulties, which in turn lead to increased levels of affective and cognitive empathy (Ştefan & Avram, 2018). Such an association has been shown in toddlers (Murphy & Laible, 2013), children (Ştefan & Avram, 2018), and adolescents (Murphy et al., 2015), but research in adulthood is scarce.

Early attachment security fosters the development of emotion understanding and empathy capacities in children and contributes to promoting these capacities in adulthood. It is likely that the influence exerted by attachment on empathy is indirect, operating through multiple mediating mechanisms, such as ER. Studies have shown that a secure working model in adults may provide a behavioral script for how to recognize others' needs for help and how to respond empathically (Groh & Roisman, 2009; Laible, Carlo, & Raffaelli, 2000; Troyer & Greitemeyer, 2018). In adults, Troyer & Greitemeyer (2017) found that adaptive ER strategies of reappraisal but not suppression mediated the relationship between attachment security and cognitive empathy. Unlike secure individuals, anxious adults are more likely to engage in distress with exacerbating mental rumination (Caldwell & Shaver, 2012; Garrison, Kahn, Miller, & Sauer, 2014; Reynolds, Searight, & Ratwik, 2014). In addition, anxious individuals tend to seek others' proximity and have a hypersensitivity towards others' emotions (Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006). In reaction to others' emotions, anxious individuals tend to focus on their own unregulated emotions, and to project their emotions on others rather than focusing on others' independent emotional states (Joireman, Needham, & Cummings, 2001; Mikulincer & Shaver, 2003; Westmaas & Silver, 2001). Anxious individuals develop a high level of personal distress and a low level of perspective-taking when exposed to others' distress (Joireman, Needham, & Cummings, 2002). Avoidant individuals use strategies to increase their distance from others in stressful situations, which make it difficult for them to empathize with others (Burnette, Davis, Green, Worthington, & Bradfield, 2009; Holmberg,

Lomore, Takacs, & Price, 2011). Indeed, avoidance attachment is associated with low levels of perspective-taking and empathic concern towards people in distress (Britton & Fuendeling, 2005; Izhaki-Costi & Schul, 2011). Although these studies revealed that attachment might influence the development of empathic abilities, they did not consider the different types of attachment insecurity and ER difficulties in adulthood (Murphy et al., 2015; Ştefan & Avram, 2018; Troyer & Greitemeyer, 2018).

Consequently, the purpose of the present study was to examine how differences in attachment styles influence ER and the cognitive and affective dimensions of empathy in adults. The first aim of this study was to compare secure, avoidant and anxious individuals regarding different dimensions of ER and empathy. Unlike individuals with a secure attachment style, we hypothesized that avoidant individuals would show ER difficulties and lower levels of affective and cognitive empathy. For anxious individuals, we also hypothesized that they would show higher levels of ER difficulties and affective empathy associated with a lower level of cognitive empathy. The second aim was to investigate whether the relationships between attachment and empathic abilities (i.e. cognitive or affective) are differently impacted by adaptive ER strategies and ER difficulties, including maladaptive ER strategies, in secure, anxious and avoidant individuals.

## **2. Method**

### ***2.1. Participants***

This study was approved by an independent ethics committee (edited out for blind review) and adhered to the tenets of the Declaration of Helsinki. A sample of 870 participants was recruited from a population of college students in different universities. Participants individually completed a questionnaire assessing attachment styles in the presence of the experimenter (Relationship Scales Questionnaire; Griffin & Bartholomew, 1994; Guédénay,

Fermanian, & Bifulco, 2010). To obtain the most sensitive and reliable assessment of attachment style, we created continuous indexes of attachment style by averaging z-transformed data (Ognibene & Collins, 1998). To recruit participants who reported one specific attachment style (e.g. exclusively secure), we selected and assigned participants according to their highest attachment category (Ognibene & Collins, 1998). Therefore, 168 of the 870 students from 18 to 26 years old (109 women;  $M = 19.96$ ;  $SD = 2.22$ ) were selected according to their highest category score on the attachment questionnaire, and who reported the most use of one attachment strategy (Ognibene & Collins, 1998). For example, secure participants reported the highest scores in the secure dimension (more than one standard deviation above the sample mean in the secure dimension) and the lowest scores in the anxiety and avoidance dimensions (less than one standard deviation below the sample mean in the anxiety and avoidance dimensions). Three groups were created, namely those with secure ( $n = 54$ ; 29 women;  $M_{age} = 20.09$  years;  $SD = 1.98$ ), anxious ( $n = 51$ ; 38 women;  $M_{age} = 20.48$  years;  $SD = 2.43$ ), or avoidant ( $n = 63$ ; 42 women;  $M_{age} = 19.8$  years;  $SD = 1.86$ ) styles. The three attachment groups were significantly different in RSQ scores ( $p < .05$ ). For example, the anxious group reported significantly higher scores in the anxious dimensions than participants of the secure and avoidant groups ( $p < .001$ ). Table 1 summarizes the attachment scores and statistics.

-----Insert Table 1 about here-----

## **2.2. Procedure**

All participants were individually invited to take part in research concerning emotions and empathy in interpersonal relationships. They were informed that their responses to the questionnaires would be anonymous and confidential. There was no compensation for participation. After each participant received an information note of the study and provided written and informed consent to participate, four self-reported questionnaires were administered in an individual room.

### 2.3. Measures

*Relationship Scales Questionnaire* (RSQ; Griffin & Bartholomew, 1994; Guédénéy et al., 2010). This scale includes 30 items that describe “feelings about close relationships” on a 5-point Likert scale ranging from 1 (not at all like me) to 5 (very much like me). Participants were asked to rate the extent to which each statement best described their characteristic style in close relationships. RSQ examines three dimensions of attachment relationships: secure, anxious and avoidant. Higher scores reflect a higher correspondence of the participant with the attachment style: (1) secure (Cronbach’s  $\alpha = .60$ ), (2) anxious ( $\alpha = .69$ ), and (3) avoidant ( $\alpha = .66$ ). Each participant reported a score in each attachment category.

*Difficulties in Emotion Regulation Scale* (DERS; Dan-Glauser & Scherer, 2013; Gratz & Roemer, 2004) is a 36-item self-report measure to assess ER difficulties with responses ranging from 1 (almost never) to 5 (almost always). The DERS contains six subscales assessing ER difficulties in: (1) acceptance of emotional response ( $\alpha = .87$ ), (2) adopting goal-directed behaviors ( $\alpha = .90$ ), (3) controlling impulsive behaviors ( $\alpha = .87$ ), (4) emotional awareness ( $\alpha = .80$ ), (5) access to ER strategies ( $\alpha = .80$ ), and (6) emotional identification ( $\alpha = .74$ ). Higher scores reflect higher ER difficulties.

*Cognitive Emotion Regulation Questionnaire*. The CERQ (Jermann, Van der Linden, d’Acromont, & Zermatten, 2006) is used to measure ER strategies that characterize the individual’s style of responding to stressful events as well as strategies that are used in a particular stressful situation. The CERQ is a 36-item questionnaire, distinguishing different coping strategies. It measures nine adaptive and maladaptive strategies of ER. Maladaptive strategies correspond to (1) self-blame ( $\alpha = .78$ ), (2) rumination ( $\alpha = .74$ ), (3) catastrophizing ( $\alpha = .68$ ) and (4) other-blame ( $\alpha = .80$ ). Adaptive strategies correspond to (5) acceptance ( $\alpha = .68$ ), (6) positive refocusing ( $\alpha = .83$ ), (7) refocusing on planning ( $\alpha = .81$ ), (8) positive reappraisal ( $\alpha = .87$ ), and (9) putting into perspective ( $\alpha = .83$ ). Items are measured on a 5-point

Likert scale ranging from 1 (almost never) to 5 (almost always). The higher the subscale score, the more a specific strategy is used.

*Interpersonal Reactivity Index.* The IRI (Davis, 1983; Gilet, Mella, Studer, Griihn, & Labouvie-Vief, 2013) was developed as a measure of the cognitive and affective components of empathy. Two subscales measure cognitive empathy: (1) perspective-taking ( $\alpha = .79$ ) (i.e. the ability to adopt another's perspective or point of view) and (2) fantasy ( $\alpha = .82$ ) (i.e. a propensity to get involved in fictional situations and to identify with fictional characters in books, movies, or plays). Two other subscales measure affective empathy: (3) empathic concern ( $\alpha = .80$ ) (i.e. the tendency to experience feelings of concern or compassion for others) and (4) personal distress ( $\alpha = .75$ ) (i.e. the tendency to experience distress or discomfort in response to others' emotional distress). Each subscale consists of seven items and is responded to on a Likert scale ranging from (does not describe me well) to 4 (describes me very well). Higher scores reflect greater affective and cognitive empathy.

#### **2.4. Statistical analyses**

First, Kruskal-Wallis non-parametric tests, which did not assume the data to be normally distributed, were performed to investigate the effect of attachment group on scores for the dimensions of the IRI, DERS and CERQ. Then, pairwise Mann-Whitney comparisons between secure, anxious and avoidant attachment groups were carried out for dimensions on which a significant effect of attachment style group was found. Bonferroni's correction was applied.

Second, associations between attachment, ER and empathy were assessed using Partial Least Squares Path Modeling (PLS-PM; Vinzi, Trinchera, & Amato, 2010). The PLS-PM method enables complex cause-effect relationship models to be estimated between observed variables (MVs) and latent variables (LVs). A full path model is composed of two sub-models: the inner model, specifying the relationships between the LVs, and the outer model, describing associations between each LV and its respective MV. For analyses, we used SmartPLS version

3.2.1 software (Ringle, Wende, & Becker, 2015).

### 3. Results

#### 3.1. Intergroup comparisons

##### *Emotion Regulation*

For DERS scores, there was a main significant effect of attachment style group on acceptance ( $\chi^2 = 11.254$ ;  $p < .01$ ;  $\eta^2 = .116$ ), goals ( $\chi^2 = 7.265$ ;  $p < .05$ ;  $\eta^2 = .075$ ), impulsivity ( $\chi^2 = 13.859$ ;  $p < .01$ ;  $\eta^2 = .143$ ), strategies ( $\chi^2 = 14.815$ ;  $p < .01$ ;  $\eta^2 = .153$ ) and identification ( $\chi^2 = 16.093$ ;  $p < .01$ ;  $\eta^2 = .166$ ). Pairwise Mann-Whitney comparisons with Bonferroni's correction revealed that anxious participants had significantly higher scores in acceptance ( $p < .01$ ), goals ( $p < .05$ ), impulsivity ( $p < .01$ ), strategies ( $p < .001$ ) and identification ( $p < .01$ ) than secure participants while avoidant participants had significantly higher scores in identification ( $p < .05$ ) than secure participants. The results are summarized in Table 2.

For CERQ scores, there was an effect of attachment style group on the strategies of rumination ( $\chi^2 = 7.981$ ;  $p < .05$ ;  $\eta^2 = .082$ ), self-blame ( $\chi^2 = 10.965$ ;  $p < .01$ ;  $\eta^2 = .113$ ) and catastrophizing ( $\chi^2 = 10.927$ ;  $p < .01$ ;  $\eta^2 = .113$ ). Pairwise Mann-Whitney comparisons with Bonferroni's correction showed that anxious participants had higher scores in rumination ( $p < .05$ ), self-blame ( $p < .01$ ) and catastrophizing ( $p < .05$ ) than secure participants. The results are summarized in Table 2.

##### *Empathy*

There was a main effect of attachment group on perspective-taking scores ( $\chi^2 = 7.548$ ;  $p < .05$ ;  $\eta^2 = 0,078$ ), fantasy ( $\chi^2 = 18.804$ ;  $p < .01$ ;  $\eta^2 = .194$ ), personal distress ( $\chi^2 = 18.297$ ;  $p < .01$ ;  $\eta^2 = .189$ ) and empathic concern ( $\chi^2 = 23.701$ ;  $p < .01$ ;  $\eta^2 = .244$ ). Pairwise comparisons with

Bonferroni's correction revealed that the anxious group reported significantly higher scores in fantasy and personal distress than the avoidant group and the secure group ( $p < .001$ ). Likewise, the anxious group reported higher scores in empathic concern than the avoidant group ( $p < .001$ ). The avoidant participants showed lower scores in empathic concern than the secure group ( $p < .05$ ). The results are summarized in Table 2. Figure 1 describes a cluster summary of average scores on DERS, CERQ and IRI in the three attachment groups.

-----Insert Table 2 and Figure 1 about here-----

### **3.2. Structural modeling**

#### *Measurement models with PLS-PM*

The first theoretical model involved 20 MVs (outer model) loaded on 5 LVs (inner model): (1) *attachment*, (2) *adaptive strategies*, (3) *emotion regulation difficulties*, (4) *cognitive empathy* and (5) *affective empathy*. The LV *attachment* corresponds to the factors of RSQ, LV *emotion regulation difficulties* refer to the factors of DERS and the maladaptive strategies of CERQ, LV *cognitive empathy* corresponds to the factors of the cognitive components of IRI and LV *affective empathy* refers to the factors of the affective components of IRI. To consider the specific effects of adaptive strategies (CERQ), which measure distinct aspects of emotion regulation difficulties, *adaptive strategies* were defined as a LV.

#### *Outer model*

Three MVs were removed because of non-significant loadings: two for the LV *emotion regulation difficulties* (i.e. other-blame and difficulties in awareness), and one for the LV *cognitive empathy* (i.e. fantasy). The resulting outer model consisted of 17 MVs loaded on 5 LVs: *attachment*, *adaptive strategies*, *emotion regulation difficulties*, *cognitive empathy* and *affective empathy*. The quality of this outer model was acceptable regarding the unidimensionality of all LVs (all DGrho  $> 0.70$ ) and cross-loadings. MVs were always more

correlated with their respective LVs (Hair, Sarstedt, Pieper, & Ringle, 2012).

*Inner models for security, anxiety and avoidance*

The inner model was built to study the relationships between *attachment*, *adaptive strategies*, *emotion regulation difficulties*, *cognitive empathy* and *affective empathy*. The inner model was tested for secure participants (i.e. the security model), for anxious participants (i.e. the anxiety model) and avoidant participants (i.e. the avoidance model).

For the security model, the goodness-of-fit (GoF) index was 0.32 and R<sup>2</sup> determination coefficients were calculated indicating small-to-moderate values: *adaptive strategies* (R<sup>2</sup> = 0.03), *emotion regulation difficulties* (R<sup>2</sup> = .12), *cognitive empathy* (R<sup>2</sup> = .12), *affective empathy* (R<sup>2</sup> = .30). For the anxiety model, the GoF was 0.36 and R<sup>2</sup> determination coefficients were calculated indicating small-to-moderate values: *adaptive strategies* (R<sup>2</sup> = .03), *emotion regulation difficulties* (R<sup>2</sup> = .28), *cognitive empathy* (R<sup>2</sup> = .11), and *affective empathy* (R<sup>2</sup> = .32). For the avoidance model, the GoF was 0.28 and R<sup>2</sup> determination coefficients were calculated indicating small-to-moderate values: *adaptive strategies* (R<sup>2</sup> = .08), *emotion regulation difficulties* (R<sup>2</sup> = .03), *cognitive empathy* (R<sup>2</sup> = .12), and *affective empathy* (R<sup>2</sup> = .28). Direct and indirect bootstrapped path coefficients are given in Table 3. In this study, the estimated values for path relationships in the structural model were evaluated in terms of sign, magnitude and significance (the latter via bootstrapping) and values of at least 0.3 indicated moderate associations (Chin, 1998).

-----Insert Table 3 about here-----

For secure participants, the direct path results showed moderate associations ( $|\beta| > 0.3$ ) between *attachment security* and *emotion regulation difficulties*, between *emotion regulation*

*difficulties* and *affective empathy*, and between *adaptive strategies* and *cognitive empathy*. The results indicated an indirect path between *attachment security* and *cognitive empathy* through *adaptive strategies*. The indirect path results also showed that the indirect effect from *attachment security* through *emotion regulation difficulties* to *affective empathy* was significant (Figure 2).

For anxious participants, the direct path results showed moderate associations ( $|\beta| > 0.3$ ) between *attachment anxiety* and *emotion regulation difficulties*, between *attachment anxiety* and *affective empathy*, between *emotion regulation difficulties* and *affective empathy*, and between *adaptive strategies* and *cognitive empathy*. The results showed an indirect path between *attachment anxiety* and *affective empathy* through *emotion regulation difficulties* (Figure 3).

For avoidant participants, the direct path results showed moderate associations ( $|\beta| > 0.3$ ) between *adaptive strategies* and *cognitive empathy*, and between *emotion regulation difficulties* and *affective empathy*. The results showed an indirect path between *attachment avoidance* and *affective empathy* through *emotion regulation difficulties* (Figure 4).

-----Insert Figures 2, 3 and 4 about here-----

## **4. Discussion**

### ***4.1. Differences in emotion regulation and empathy according to attachment style***

The first aim of this study was to investigate how attachment styles influence ER difficulties, adaptive strategies of ER, and affective and cognitive dimensions of empathy in adults. First, our results indicated that anxious individuals revealed higher levels of personal distress and fantasy than secure and avoidant individuals. These results are consistent with the

study of Joireman, Needham and Cummings (2001) showing that attachment anxiety is associated with high levels of personal distress, the tendency to experience distress or discomfort in response to others' emotional distress and different altruistic motivations for the ultimate goal of reducing the needs of another person (Gilet, Mella, Studer, Grünh, & Labouvie-Vief, 2013). In addition, the current findings expand these results by showing the importance of fantasy in anxious participants, reflecting their propensity to transpose themselves imaginatively into the emotional lives of fictional characters found in books and movies (Davis, 1980, 1983). Several studies have shown that individuals with higher fantasy levels are more likely to imagine what another is experiencing and then feel those emotions themselves (Adams, 2001). Previous studies have found that anxious individuals tend to project their emotions onto others rather than focusing on others' independent affective states (Joireman et al., 2002; Mikulincer, Shaver, & Pereg, 2003; Westmaas & Silver, 2001). In line with these results, our findings suggest that anxious attachment, characterized by high levels of personal distress and fantasy, could lead to a greater overlap between the self and other and impairments in interpersonal relationships (Calderoni et al., 2013; Gleason, Jensen-Campbell, & Ickes, 2009; Ruby & Decety, 2004).

In addition, avoidant individuals reported lower levels of empathic concern than secure and anxious individuals. These results point out that low levels of empathic concern may be indicative of low social skills and social loneliness in avoidant individuals (DiTommaso, Brannen-McNulty, Ross, & Burgess, 2003). Lastly, a low level of affective empathy in these individuals would be more likely to be associated with overall socio-cognitive difficulties, especially in assessing others' and one's own emotional state (Schipper & Petermann, 2013).

Second, we observed that the different attachment styles were characterized by different ER difficulties. Indeed, anxious individuals showed more ER difficulties than secure individuals, especially in identifying and accepting emotions, controlling impulsivity, pursuing

goal-oriented behaviors as well as difficulties in accessing ER strategies. The results also showed that anxious individuals reported a higher use of rumination, self-blame and catastrophization than secure individuals. These findings are congruent with previous studies, which have highlighted that anxious individuals experience negative emotions more intensely, have easier access to negative memories, and have difficulties in suppressing negative feelings (Feeney, 1995; Marganska, Gallagher, & Miranda, 2013; Mikulincer & Orbach, 1995). Our findings suggest that rumination associated with difficulties in accessing adaptive strategies in anxious individuals may constitute a risk factor for severe and prolonged periods of distress (Nolen-Hoeksema, 1987; Nolen-Hoeksema, Parker, & Larson, 1994).

In addition, our results revealed that avoidant individuals showed more difficulties in identifying emotions than secure individuals. These findings are consistent with the growing body of research indicating that avoidant individuals are more likely to engage in deactivating strategies and actively repress a conscious awareness of attachment feelings (Fraley & Waller, 1998; Mallinckrodt & Wei, 2005; Wei, Vogel, Ku, & Zakalik, 2005). All these results provide empirical evidence that individuals with different attachment styles show distinct ER abilities, as well as different affective and cognitive empathic capacities. Thus, in adulthood, attachment styles still influence the processing of socio-emotional information by the use of certain emotion regulation strategies and by sensitivity to the distress of partners.

#### ***4.2. Relationships between attachment, emotion regulation and empathy***

The second aim of this study was to investigate whether the relationships between attachment strategies and empathy (i.e. cognitive or affective) are differently impacted by adaptive ER strategies and ER difficulties including maladaptive ER strategies in secure, anxious and avoidant individuals. Although previous research has consistently identified the associations between attachment security and empathy (Panfile & Laible, 2012; Troyer & Greitemeyer, 2018), our results indicated that attachment styles influenced affective and

cognitive empathy through ER difficulties and adaptive ER strategies in more complex ways than previously hypothesized. Specifically, the results highlighted that adaptive ER strategies mediated the relationship between security attachment strategies and cognitive empathy in secure individuals. Secure individuals used more adaptive ER strategies, enabling them to take another person's perspective more adequately. These findings complete the previous results of Troyer and Greitemeyer (2017) demonstrating that the ER strategy of reappraisal provides better cognitive empathy in secure individuals. A key contribution of our results is that the relationship between higher levels of attachment security and higher scores in perspective-taking was mediated by the use of adaptive ER strategies such as acceptance, positive reappraisal, positive refocusing, putting into perspective and refocusing on planning. Conversely, there was only a direct association between adaptive ER strategies and cognitive empathy in individuals with avoidant or anxious attachment. The use of adaptive ER strategies and cognitive empathy was not predicted by higher levels of anxious or avoidant attachment and could rather be associated with other psychological processes, such as the quality of the emotion regulation processes of the parents or the level of mentalization (e.g. Fonagy, Steele, Steele, Moran, & Higgitt, 1991).

Furthermore, the results showed that ER difficulties had an important mediating role in the association between adult attachment strategies and affective empathy. They revealed that a high level of attachment security was associated with lower affective empathy (i.e. personal distress and empathic concern) indirectly through lower levels of ER difficulties in secure individuals. This result supports the findings of previous studies (Murphy et al., 2015; Panfile & Laible, 2012; Troyer & Greitemeyer, 2018) showing that ER abilities mediate the relationship between attachment security and empathy. Another contribution of these results is that higher levels of avoidant and anxious attachment led to an increase in ER difficulties, which in turn contributed to the emergence of higher affective empathy. Finally, these results

suggested that avoidance and anxious attachment were associated with ER difficulties, thereby increasing affective empathy, such as personal distress and a tendency to experience feelings of concern or compassion for others. The results also evidenced that anxious attachment had both a direct effect on affective empathy and an indirect effect through ER difficulties. One can suggest that the impact of anxious attachment leads to more severe emotional disturbances than those observed in avoidant individuals. Thus, in future research, we intend to explore the role of emotional variables other than emotion regulation that might serve as mediators between anxious attachment and affective empathy.

#### ***4.3. Limitations and strengths***

Although the current study revealed relevant findings, it has some limitations. The present results were based entirely on self-report measures. Nevertheless, the use of self-reported attachment styles provided a large initial sample, enabling the screening of individuals with specific attachment insecurity (avoidance or anxiety). Replication with other methods of data collection (e.g. observer ratings or other-report) would be useful in future research, which should also include both the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996) and self-report measures of adult attachment. Interview methods and self-report methods assess different facets of adult attachment. Attachment dimensions measured in self-reports may reflect a stress–diathesis perspective on attachment dynamics, whereas the AAI scoring reflects unconscious processes and states of mind (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). The second limitation concerns the over-representation of female participants in our sample. Several studies have shown that socio-emotional competences may differ according to gender (e.g. Eisenberg & Lennon, 1983; Van der Mark, Van IJzendoorn, & Bakermans-Kranenburg, 2002). Another limitation concerns Cronbach's alpha coefficients for the subscales of the RSQ indicating a mean internal consistency between 0.60 and 0.69. These values could be explained by the number of items, which is known to influence strongly the alpha coefficient

(Cortina, 1993). When considering the factors resulting from the factor analysis, the test-retest reliability is satisfactory ( $\geq 0.80$ ) for the scores of the three scales of the RSQ (Guédénéy et al., 2010). Finally, the last limitation concerns the absence of an assessment of suppression among ER strategies. Additional investigations are needed to evaluate other cognitive strategies of ER that may contribute to the relationships between attachment styles and empathy. Although the present results were computed using PLS-PM (Vinzi et al., 2010), they are still based on correlational data. Longitudinal studies employing measures of attachment at multiple time-points may help to clarify how attachment shapes the pathways to ER and empathy at different ages.

## **5. Conclusion**

Taken together, these findings provide attachment research with empirical support by showing that attachment experiences may influence affective and cognitive empathy, especially through ER abilities in adulthood. The present study emphasizes the importance of differentiating affective empathy from cognitive empathy in order to evaluate whether differences in attachment styles are likely to trigger difficulties in the ability to construct mental representations of distress and to adopt another's perspective as well as to experience compassion or distress in response to others' emotional distress. These distinct capacities could display different trajectories reflecting the different developmental pathways from experiences in attachment relationships.

Finally, the findings of the present study have specific implications for clinical interventions targeting the development of socio-emotional competences. The therapeutic goals might be to restore a sense of attachment security in individuals with high levels of insecure attachment through the identification of specific ER difficulties and maladaptive ER strategies and by helping them develop alternative ER strategies in response to others' distress (Gross, 2013). This, in turn, could help them to differentiate their own internal states from those of

others and to become more confident in their own emotional processes, thereby facilitating the development of socio-emotional competences (Schipper & Petermann, 2013; Stern & Cassidy, 2017).

**Conflicts of interest:** None.

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Table 1. Descriptive statistics and intergroup comparisons between secure, anxious and avoidant individuals.

	Secure ( <i>n</i> = 54)		Anxious ( <i>n</i> = 51)		Avoidant ( <i>n</i> = 63)		Statistics
	M	SD	M	SD	M	SD	
Age	20.09	1.98	20.48	2.43	19.80	1.86	$\chi^2 = .866^b$
RSQ - Secure	3.85	.35	2.79	.41	2.82	.43	$\chi^2 = 91.239^{***a}$
RSQ – Anxious	2.90	.54	4.29	.41	2.68	.74	$\chi^2 = 83.430^{***a}$
RSQ - Avoidant	2.79	.53	2.99	.48	3.90	.47	$\chi^2 = 60.079^{***a}$

*Note.* <sup>a</sup> Kruskal-Wallis test. <sup>b</sup> Chi-Square test. RSQ: Relationships Scale Questionnaire. *n*: sample size. M: Mean. SD: Standard Deviation.

\*\*\*  $p < 001$ . *N* =168.

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Table 2. Descriptive statistics and intergroup comparisons between secure, anxious and avoidant individuals.

	Descriptive statistics						Intergroup comparisons					
	Secure		Anxious		Avoidant		Secure - Avoidant		Secure - Anxious		Avoidant - Anxious	
	(n = 54)		(n = 51)		(n = 63)		U	$\eta^2$	U	$\eta^2$	U	$\eta^2$
	M	SD	M	SD	M	SD	U	$\eta^2$	U	$\eta^2$	U	$\eta^2$
<b>IRI</b>												
Perspective-taking	26.481	4.055	24.078	5.469	24.048	5.347	1268.5	0.0484	1002.5	0.0557	1596.5	0.0000
Fantasy	26.463	5.240	30.078	3.161	26.683	5.012	1660	0.0004	775***	0.1442	957***	0.1220
Empathic concern	26.500	5.298	27.549	4.627	23.762	5.031	1176.5*	0.0712	1219	0.0099	874.5***	0.1548
Personal distress	19.556	5.421	24.765	4.727	21.810	5.605	1248.5	0.0529	642***	0.2143	1110*	0.0712
<b>DERS</b>												
Acceptance	12.259	6.119	16.412	7.346	14.460	6.858	1329	0.0359	869**	0.1024	1331	0.0219
Goals	15.074	5.421	17.902	4.937	15.778	5.754	1570	0.0044	964*	0.0677	1271	0.0325
Impulsivity	11.722	5.134	15.863	6.060	13.397	5.796	1406	0.0226	807**	0.1290	1202	0.0472
Awareness	15.037	4.960	14.843	4.941	16.476	5.708	-	-	-	-	-	-

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Strategies	18.778	6.762	24.392	7.181	20.794	8.217	1480	0.0126	782***	0.1402	1148	0.0605
Identification	10.630	3.959	13.373	4.368	13.968	5.233	1040**	0.1133	863.5**	0.1049	1535.5	0.0015
<b>CERQ</b>												
Positive refocusing	11.833	3.771	10.235	3.840	11.000	4.621	-	-	-	-	-	-
Positive reappraisal	14.296	3.820	12.647	3.687	13.333	4.220	-	-	-	-	-	-
Putting into perspective	14.204	4.200	12.686	3.792	13.206	4.378	-	-	-	-	-	-
Refocusing on planning	14.074	3.238	13.176	3.798	13.000	4.092	-	-	-	-	-	-
Acceptance	14.481	2.906	14.373	3.857	15.476	3.412	-	-	-	-	-	-
Rumination	13.222	3.559	15.255	3.577	13.667	4.154	1583	0.0036	945*	0.0744	1248.5*	0.0371
Self-blame	10.481	3.179	12.902	3.667	12.016	4.387	1296*	0.0426	862**	0.1063	1436.5	0.0084
Other-blame	8.111	2.820	9.039	3.417	8.413	3.368	-	-	-	-	-	-
Catastrophizing	6.778	2.731	9.216	3.971	7.889	3.446	1381	0.0269	874.5*	0.1014	1295.5	0.0281

*Note.* DERS: Difficulties in Emotion Regulation Scale. CERQ: Cognitive Emotion Regulation Questionnaire. IRI: Interpersonal Reactivity Index. Post-hoc Bonferroni's correction was applied to the p-value in dimensions of IRI, DERS and CERQ.

\*\*\*  $p < .001$ . \*\*  $p < .01$ . \*  $p < .05$ . N = 168.

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Table 3. Direct and indirect bootstrapped paths in secure, anxious and avoidant individuals.

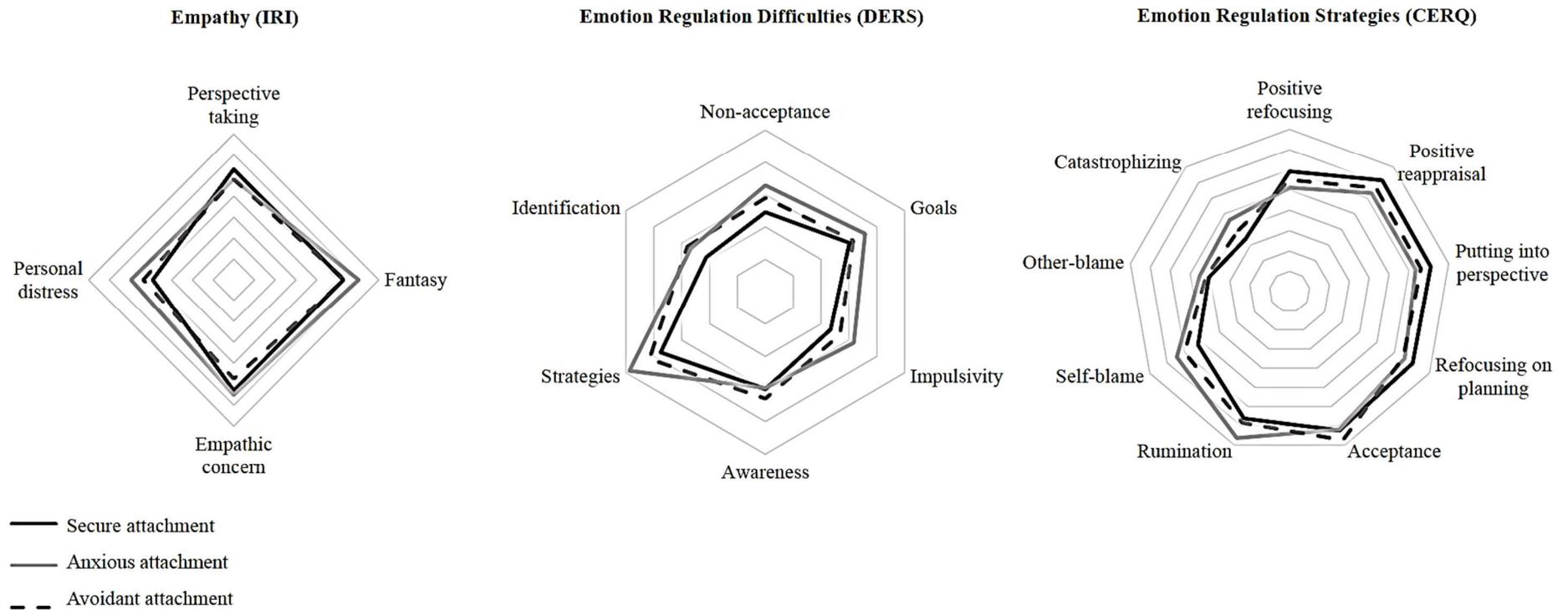
	Secure attachment (n = 54)		Anxious attachment (n = 51)		Avoidant attachment (n = 63)	
	Mean (SD)	95 % CI	Mean (SD)	95 % CI	Mean (SD)	95 % CI
<i>Direct paths</i>	-	-	-	-	-	-
Secure strategies - adaptive strategies	.199(.076)	[0.031; 0.332]*	-	-	-	-
Secure strategies - ERD	0.355(0.065)	[-.463; 0.200]**	-	-	-	-
Secure strategies - cognitive empathy	.102(.067)	[-.029; 0.225]	-	-	-	-
Secure strategies - affective empathy	-.074(.095)	[-.256; 0.107]	-	-	-	-
Anxious strategies - cognitive empathy	-	-	.115(0.092)	[-0.069; 0.291]	-	-
Anxious strategies - affective empathy	-	-	0.325(0.083)	[.151; 0.473]**	-	-
Anxious strategies - adaptive strategies	-	-	-.192(.092)	[-.327; 0.058]	-	-
Anxious strategies - ERD	-	-	.528(.055)	[0.395; 0.616]**	-	-
Avoidant strategies - adaptive strategies	-	-	-	-	.095(.099)	[-.258; 0.128]
Avoidant strategies - ERD	-	-	-	-	.179(.075)	[.012; 0.304]*
Avoidant strategies - cognitive empathy	-	-	-	-	.079(.066)	[-.214; 0.051]
Avoidant strategies - affective empathy	-	-	-	-	.064(.087)	[-.211; 0.121]
Adaptive Strategies - cognitive empathy	.348(.085)	[0.105; 0.465]**	.321(.102)	[0.046; 0.467]**	.348(.095)	[.123; 0.479]**
Adaptive Strategies - affective empathy	-.059(.089)	[-0.206; 0.134]	-.050(.093)	[-.208; 0.162]	.051(.104)	[-.206; 0.222]

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ERD - cognitive empathy	0.072 (0.078)	[-.087; 0.227]	-.016(.081)	[-.226; 0.171]	.055(.084)	[-.139; 0.202]
ERD - affective empathy	0.495 (0.073)	[.331; 0.615]**	.310(.081)	[.130; 0.451]**	.522(.062)	[.376; 0.620]**
<i>Indirect paths</i>	-	-	-	-	-	-
Secure strategies - ERD - cognitive empathy	0.028	[-.083; 0.025]	-	-	-	-
Secure strategies - adaptive strategies - cognitive empathy	0.031	[.008; 0.131]*	-	-	-	-
Secure strategies - ERD - affective empathy	0.043	[-.255; -0.089]**	-	-	-	-
Secure strategies - adaptive strategies - affective empathy	0.019	[-0.054; 0.025]	-	-	-	-
Anxious strategies - ERD - cognitive empathy	-	-	-.009(.054)	[-0.121; 0.086]	-	-
Anxious strategies - adaptive strategies - cognitive empathy	-	-	-.057(.031)	[-0.115; 0.007]	-	-
Anxious strategies - ERD - affective empathy	-	-	.163(.044)	[-0.067; 0.241]*	-	-
Anxious strategies - adaptive strategies - affective empathy	-	-	.011(.019)	[-0.026; 0.049]	-	-
Avoidant strategies - ERD - cognitive empathy	-	-	-	-	.009(.016)	[-.020; 0.046]
Avoidant strategies - adaptive strategies - cognitive empathy	-	-	-	-	-.035(.036)	[-.099; 0.035]
Avoidant strategies - ERD - affective empathy	-	-	-	-	.094(.042)	[.006; 0.169]*
Avoidant strategies - adaptive strategies - affective empathy	-	-	-	-	.002(.017)	[-.017; .043]

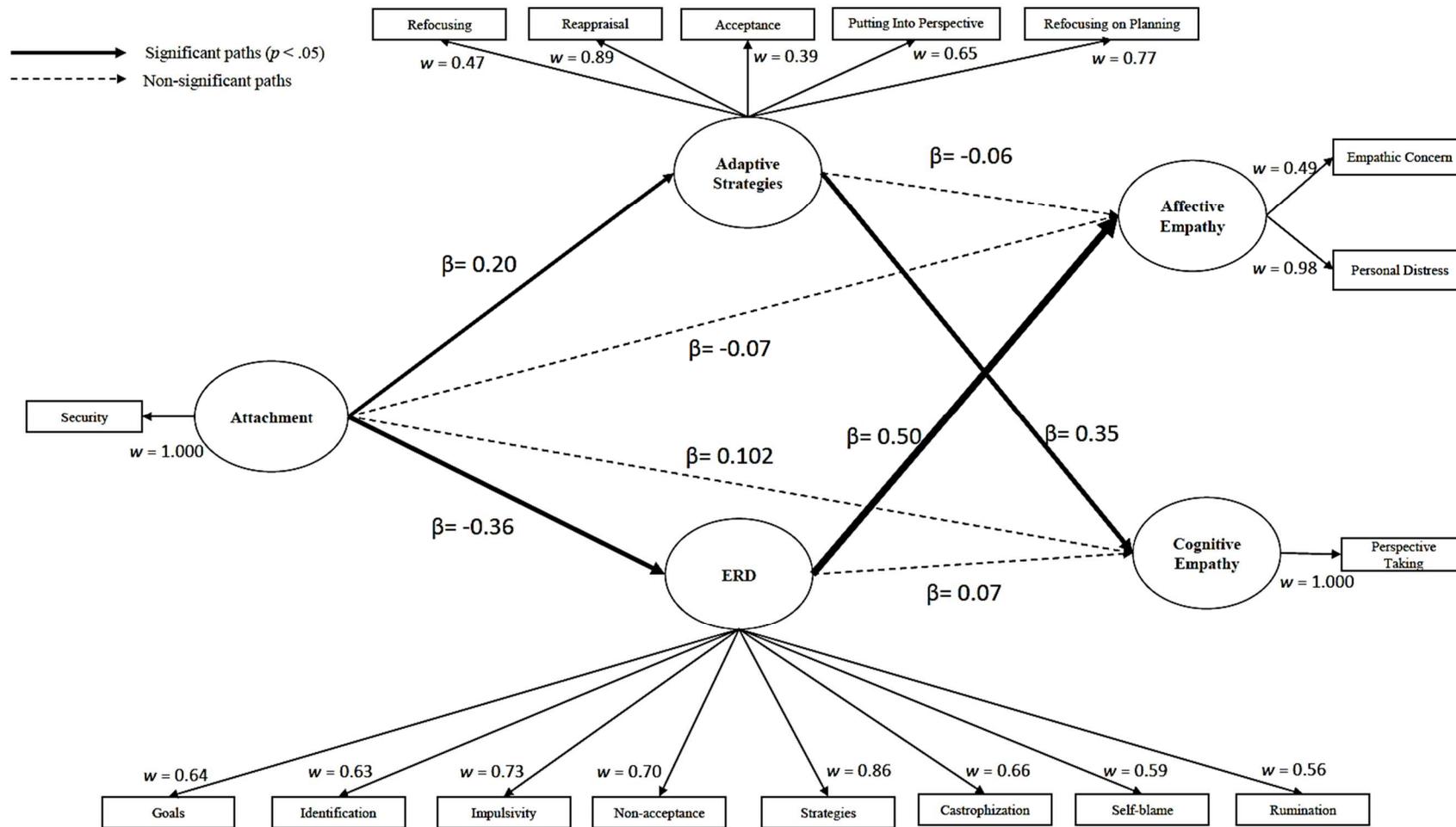
Note. \*  $p < .05$ ; \*\*  $p < .01$ ; ERD: Emotion Regulation Difficulties; CI: Confidence Interval

Figure 1. Cluster summary of scores in empathy (IRI), emotion regulation difficulties (DER) and ER strategies (CERQ) in secure, anxious and avoidant individuals.



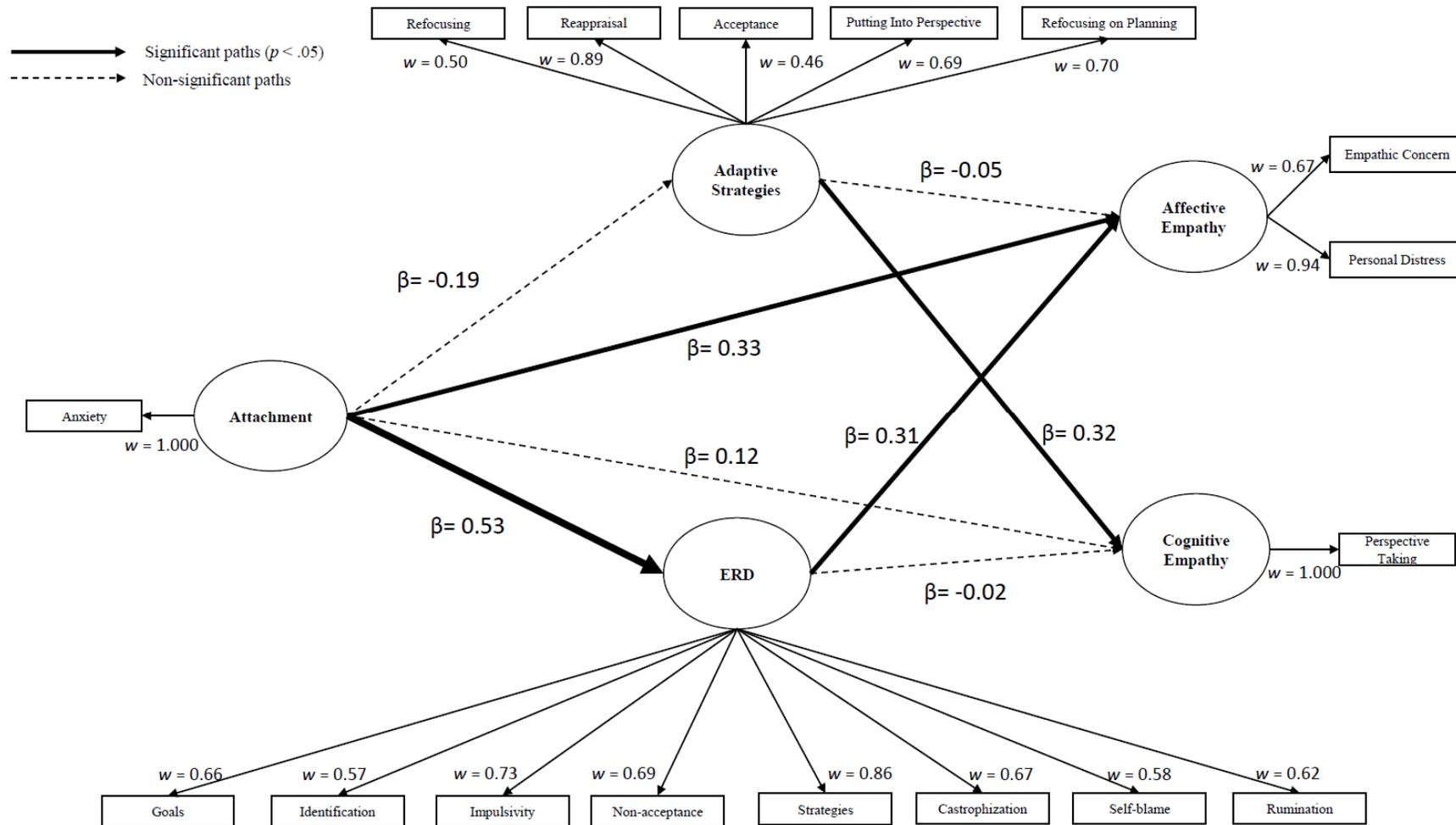
Note. ERD: Emotion Regulation Difficulties. DER: Difficulties in Emotion Regulation scale. CERQ: Cognitive Emotion Regulation Questionnaire. IRI: Interpersonal Reactivity Index.

Figure 2. PL-PM graphs for secure participants.



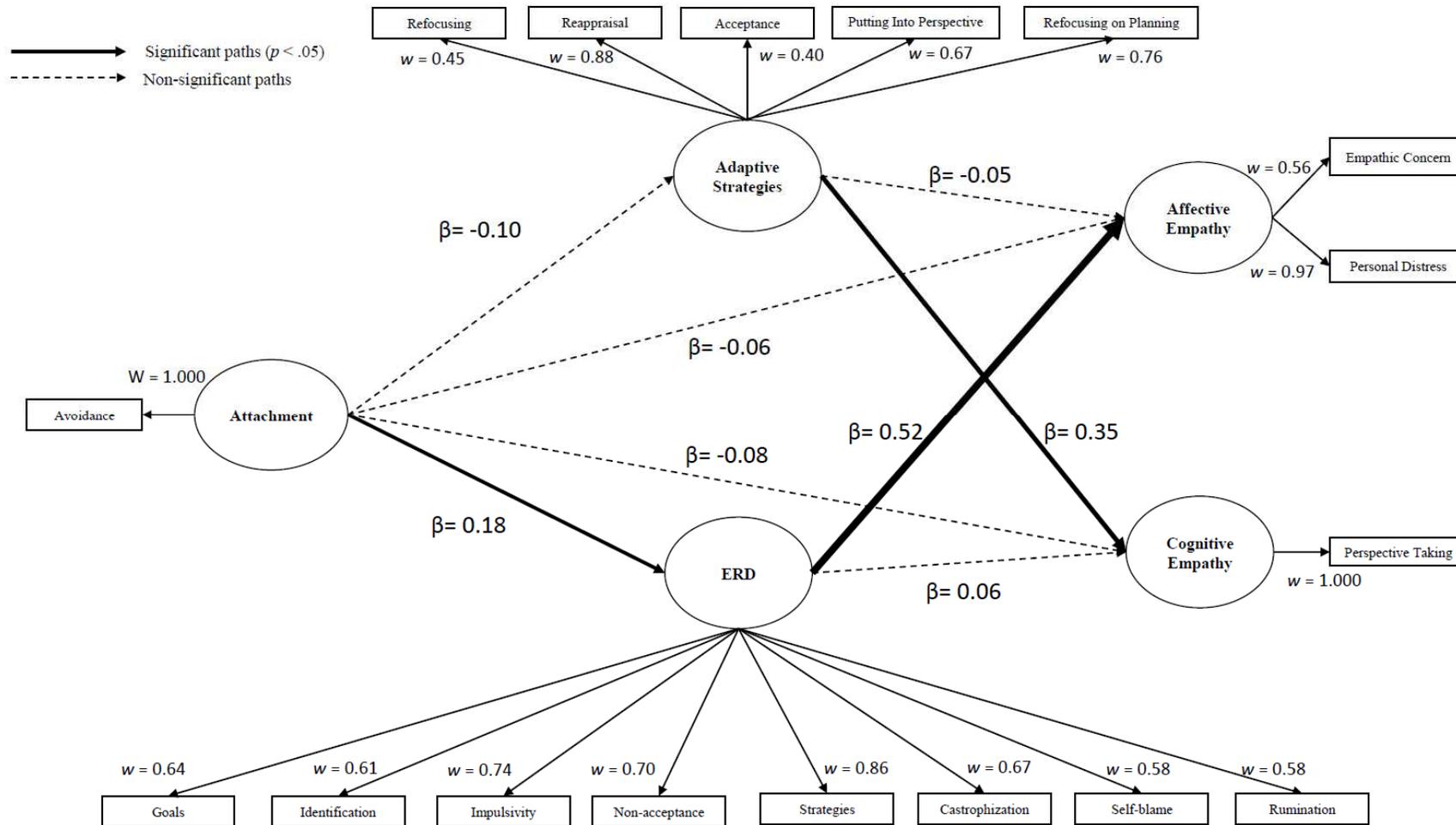
Note. ERD: Emotion Regulation Difficulties. Larger arrows represent stronger paths.

Figure 3. PLS-PM graphs for anxious participants.



Note. ERD: Emotion Regulation Difficulties. Larger arrows represent stronger paths.

Figure 4. PLS-PM graphs for avoidant participants.



Note. ERD: Emotion Regulation Difficulties. Larger arrows represent stronger paths.