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The relationship between attachment styles and internalizing/externalizing problems: the mediating role of self-criticism

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Full Title:	The relationship between attachment styles and internalizing/externalizing problems: the mediating role of self-criticism
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Abstract:	<p>Objectives. Many recent studies have explored the potential links between attachment style dimensions, personality vulnerability factors for psychopathology, and psychological and behavioral problems, particularly those along the internalizing and externalizing spectrum. However, previous studies have not examined these links within a structural equation model that can examine multiple predictors and outcomes, and therefore have not fully investigated the specificity of links between these factors. This cross-sectional study examined the mediating role of self-criticism in the relationship between attachment style dimensions and internalizing and externalizing problems.</p> <p>Method. The sample included 420 nonclinical adolescents aged 14-20 years who were re-recruited in school settings and completed self-reported measures of attachment style dimensions (Attachment Style Questionnaire), self-criticism (Depressive Experiences Questionnaire), and internalizing and externalizing problems (Youth Self-Report). Structural equation modeling was used to test the proposed mediation model and to ascertain direct and indirect effects among study variables.</p> <p>Results. Results shown that self-criticism mediated the link between both attachment avoidance and anxiety, and internalizing problems. Results were not moderated by gender.</p> <p>Conclusions. Results suggest that self-criticism is associated with psychopathology during adolescence, and accounts for the associations of attachment style dimensions with internalizing and externalizing problems.</p>
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The relationship between attachment styles and internalizing/externalizing problems: the mediating role of self-criticism

Keywords: Adolescence; attachment style; personality vulnerability; psychopathology

Abstract

Objectives. Many recent studies have explored the potential links between attachment style dimensions, personality vulnerability factors for psychopathology, and psychological and behavioral problems, particularly those along the internalizing and externalizing spectrum.

However, previous studies have not examined these links within a structural equation model that can examine multiple predictors and outcomes, and therefore have not fully investigated the specificity of links between these factors. This cross-sectional study examined the mediating role of self-criticism in the relationship between attachment style dimensions and internalizing and externalizing problems.

Method. The sample included 420 nonclinical adolescents aged 14-20 years who were recruited in school settings and completed self-reported measures of attachment style dimensions (Attachment Style Questionnaire), self-criticism (Depressive Experiences Questionnaire), and internalizing and externalizing problems (Youth Self-Report). Structural equation modeling was used to test the proposed mediation model and to ascertain direct and indirect effects among study variables.

Results. Results shown that self-criticism mediated the link between both attachment avoidance and anxiety, and internalizing problems. Results were not moderated by gender.

Conclusions. Results suggest that self-criticism is associated with psychopathology during adolescence, and accounts for the associations of attachment style dimensions with internalizing and externalizing problems.

Introduction

Recent studies have explored the potential links between attachment styles, personality vulnerability factors for psychopathology, and internalizing and externalizing continuum (Campos, Besser, Abreu, Parreira, & Blatt, 2014; Kopala-Sibley, Zuroff, Hankin, & Abela, 2015; Kopala-Sibley & Zuroff, 2014; de Vries, Hovee, Stams, & Asscher, 2015). However, it remains unclear whether specific personality traits account for the relationship between specific attachment styles and specific symptoms of psychopathology.

Understanding the complex links between early attachment styles, personality traits that confer vulnerability to mental illness, and internalizing versus externalizing problems is important for several reasons. First such models may provide insight into the unique versus overlapping associations between attachment styles, traits, and psychopathology. For instance, both anxious and avoidant attachment styles are associated with internalizing symptoms. However, it is unclear whether they predict internalizing symptoms adjusting for each other's effects. It is also unclear whether personality traits may mediate this association, or whether traits may mediate the effects of anxious versus avoidant attachment styles on internalizing versus externalizing symptoms. Indeed, these etiological pathways are undoubtedly complex, and the current study aims to disentangle some of these relationships by examining whether personality traits mediate the effects of anxious versus avoidant attachment on internalizing versus externalizing symptoms. Finally, this study examines a sample of youth. This is important as adolescence is a period characterized by ongoing personality development and by increases in rates of depression (Hankin et al., 1998).

Moreover, attachment styles largely develop out of the parent-child relationship (Mikulincer & Shaver, 2007), and the internal working models that stem from these relationships likely influence the development of adolescents' personality traits, including self-

1 criticism. Indeed, in their review, Kopala-Sibley and Zuroff (2014) conclude there is a robust
2 relationship between maladaptive parenting and the development of personality traits in ado-
3 lescence that confer vulnerability to psychopathology, including both internalizing and exter-
4 nalizing symptoms. As such, understanding the links between early attachment styles, ado-
5 lescents' personality traits, and internalizing and externalizing symptoms is important.
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11 *Attachment theory and internalizing and externalizing problems*

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19 According to attachment theory (Bowlby, 1982), through interactions with primary
20 caregivers, children develop expectations about their caregivers' availability, which serve as
21 the basis for internal working models of the self and the other. Moreover, the quality of at-
22 tachment experiences between parents and children may form the basis for later personality
23 development as well as risk for psychopathology (Nishikawa Sundbom, & Hägglöf, 2010).
24 Specifically, prior research found associations between insecure attachment and internalizing
25 (Neves Nunes, Faraco, Vieira, & Rubin, 2013) as well as externalizing problems in youth
26 (Balan, Dobrean, Roman, & Balazsi 2017; Tambelli, Laghi, Odoriso, & Notari 2012). Inter-
27 nalizing problems are described as problematic internal feelings associated with anxiety, fear,
28 low self-esteem, withdrawn and depression. In contrast, externalizing problems are outer-
29 directed, and they are characterized by disruptive, hyperactive, antisocial, and aggressive be-
30 haviors (Achenbach, 1991).
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48 According to Muris, Meesters, and van den Berg (2003), whether someone exhibits in-
49 ternalizing versus externalizing psychopathology is primarily determined by the strategies
50 they use to either minimize or maximize the expression of attachment needs. Use of minimiz-
51 ing strategies is posited to predispose individuals to externalizing disorders as they may deny
52 their distress and adopt a hostile, defensive attitude towards others. Use of maximizing strat-
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1 egies may to lead to internalizing disorders as children focus on their own distress and dis-
2 play an excessive need for love and support from others (Muris et al., 2003).
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5 Furthermore, gender might also be a factor in the development of attachment styles and
6 psychopathology. For example, in both clinical and non-clinical samples, female gender has
7 been associated with an anxious attachment style, and male gender has been associated with
8 an avoidant attachment style during adolescence (see Lacasa, Mitjavila, Ochoa, & Balluerka,
9 2015). Moreover, in the large majority of studies (e.g. Afzali, Sunderland, Carragher, &
10 Conrod, 2018; Kramer, Krueger, & Hicks, 2008) gender was not associated with general psy-
11 chopathology. Instead, females typically reported higher mean levels of internalizing symp-
12 toms, while males reported higher mean levels of externalizing symptoms. Furthermore, in a
13 study conducted on an Italian sample of adolescents (Tambelli et al., 2012), females showed
14 elevated internalizing, but not externalizing problems, relative to males.
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29 The empirical evidence on the relationship between attachment styles and internalizing
30 versus externalizing problems therefore remains unclear. For example, while some studies
31 found that anxious and avoidant attachment predicted internalizing problems in adolescents,
32 with a weak or non-significant relationship between avoidant attachment and externalizing
33 problems (Brumariu & Kerns, 2010; Lacasa et al., 2015), other studies found significant as-
34 sociations between an avoidant attachment style and externalizing problems (Ramos, Canta,
35 de Castro, & Leal, 2016; Nishikawa et al., 2010). Muris et al. (2003) provide further conflict-
36 ing evidence in that they found that insecurely attached girls displayed higher levels of inter-
37 nalizing symptoms than insecurely attached boys. In light of the above inconsistent findings,
38 researchers have suggested considering multiple potential mediating relationships in the as-
39 sociation between attachment and internalizing and externalizing problems (e.g. Fearon,
40 Bakermans-Kranenburg, van Ijzendoorn, Lapsley, & Roisman, 2010; NICHD ECCRN,
41 2006).
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2 *Blatt's two-polarities model, attachment theory and internalizing and externalizing*
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4 *problems*
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9 According to Blatt's *two-polarities* model (2008), mature personality is a synergistic
10 and balanced product of two main developmental dimensions that extend across the lifespan:
11 interpersonal relatedness, which involves developing the capacity for mature, intimate, recip-
12 rocal, and mutually satisfactory interpersonal relationships; and self-definition, involving the
13 development of a realistic, integrated, and differentiated identity or sense of self (for a re-
14 view, see Luyten & Blatt, 2013; Kopala-Sibley & Zuroff, 2014). A severe disruption in the
15 development of a healthy sense of relatedness or self-definition may lead to high levels of
16 two pathological personality styles respectively labeled dependency and self-criticism, alt-
17 hough self-criticism is the focus of the current study given its robust links to internalizing and
18 externalizing symptoms (Blatt, 2004; Zuroff, Mongrain, & Santor, 2004). Self-criticism is
19 characterized by feelings of low self-worth and guilt, and excessive needs to ascertain, con-
20 firm, and preserve status and value in the eyes of important others (Blatt & Blass, 1996).
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38 Luyten and Blatt (2013) discuss how Blatt's two-configurations model and attachment
39 theory both emphasize that personality functioning involves a balance between relatedness
40 and self-definition expressed in low to moderate levels of attachment anxiety and avoidance
41 typical of secure attachment. Maladaptive personality functioning, in contrast, typical of in-
42 secure attachment, results from an overemphasis on relatedness/attachment anxiety or self-
43 definition/attachment avoidance or both. The attachment avoidance dimension is conceptual-
44 ly related to the self-critical dimension; more specifically, according to Luyten and Blatt
45 (2011), self-criticism may stem from a particular form of avoidant attachment, namely fear-
46 ful-avoidant attachment. These individuals are characterized by a desire for approval, fear of
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1 emotional closeness, and dissatisfaction with and distrust of others. They tend to show an ap-
2 proach-avoidance conflict in relationships, reflecting a combination of attachment anxiety
3 and avoidance (Cantazaro & Wei, 2010). Attachment anxiety, in contrast, is conceptually re-
4 lated to the dependent dimension (Mikulincer & Shaver, 2007). Major features of attachment
5 anxiety are the desire for interpersonal closeness and a fear of interpersonal rejection or
6 abandonment (Brennan, Clark, & Shaver, 1998). These individuals may therefore develop a
7 dependent tendency in order to ensure others' availability and validation. Indeed, Zuroff and
8 Fitzpatrick (1995) found that attachment anxiety was positively correlated with dependency
9 while avoidance was positively related to self-criticism.
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22 Despite having similarities, however, Blattian variables are conceptually different from,
23 and not reducible to, attachment style dimensions. For instance, Besser and Priel (2003)
24 found that when self-critical individuals show secure attachment styles, self-criticism does
25 not result in negative outcomes: it is the convergence of negative models of others and self
26 with self-critical attitudes that constitutes a risk of psychopathology, suggesting that self-
27 criticism and insecure attachment are not redundant. From the perspective of broader models
28 of personality (McCrae, 2000), attachment styles may be seen as "basic tendencies" which
29 are fundamental dispositions that are present early in life, whereas self-criticism and depend-
30 ency would constitute "characteristic adaptations" that develop out of basic tendencies as
31 ways to cope with or adapt to those basic tendencies.
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46 Many associations also have been found between Blatt's two-polarities model and in-
47 ternalizing and externalizing symptoms. In a 12-month prospective study of 460 sixth and
48 seventh graders, Shahar, Blatt, Zuroff, Kuperminc, and Leadbeater (2004) found that self-
49 criticism predicts increases in depressive symptoms in girls, but not boys, independent of
50 negative stressful events. Other studies found that higher levels of self-criticism were associ-
51 ated with more internalizing as well as externalizing problems in both girls and boys (e.g.
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1 Campos, Besser, Morgado, & Blatt, 2014). Finally, while self-criticism tends to be associated
2 with internalizing problems in both males and females, some evidence has found gender dif-
3 ferences in the association of these traits with externalizing problems. Campos et al. (2014)
4 found that externalizing symptoms in boys were related to self-criticism in boys but not girls.
5 The authors speculated that, in girls, externalizing behaviors may be the consequence of fac-
6 tors other than personality dimensions, such as socio-economic factors and peer relationships.
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17 *The present study*

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21 The present cross-sectional study aimed to explore the associations between attachment
22 style dimensions, the personality vulnerability trait of self-criticism, and internalizing and ex-
23 ternalizing behaviors in youth. We tested these associations in a mediation model. Such mod-
24 els are important as they permit the analysis of multiple indirect effects of predictors (i.e., at-
25 tachment styles) on outcomes (i.e., internalizing versus externalizing symptoms) via a media-
26 tor (i.e., self-criticism) while adjusting for the effects of each variable. Moreover, these mod-
27 els test complex hypothesized etiological pathways, thereby potentially providing a fuller un-
28 derstanding of the links between early attachment styles, self-criticism, and internalizing and
29 externalizing symptoms. Finally, externalizing and internalizing symptoms likely share sub-
30 stantial variance. Including both internalizing and externalizing as outcomes allows examina-
31 tion of whether independent variables are significantly related to either while adjusting for
32 the covariance between internalizing and externalizing symptoms.
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51 Because empirical evidence on the link between attachment styles and internalizing
52 versus externalizing problems remains unclear, this study aimed to explore the mediating role
53 of the personality trait of self-criticism in the relationship between attachment styles and psy-
54 chopathological problems (Luyten & Blatt, 2011). Specifically, the current study examined
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1 whether the relations between attachment style dimensions and internalizing and externalizing
2 symptoms is direct or, as it was expected, mediated by the personality trait of self-
3 criticism as proposed by Blatt and colleagues. The current study also investigated potential
4 gender differences in the relations among these variables given that some studies have found
5 that males scored somewhat higher than females on self-criticism (Kopala-Sibley, Mongrain,
6 & Zuroff, 2013; for a review, see Campos et al., 2014).

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8 Therefore, it was hypothesized that: (a) self-criticism will significantly mediate the link
9 between attachment avoidance and both internalizing and externalizing symptoms; b) self-
10 criticism will significantly mediate the link between attachment anxiety and both internalizing
11 and externalizing symptoms. Further, we did not have an *a priori* hypothesis that there
12 would be gender differences in the current study.

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516 high school students were invited to participate: 47 of these did not give consent, so 469 participated. Preliminary data screening and cleaning (see the results section) yielded a final sample of 420 (70.0% female; $M_{\text{age}} = 15.91$, $SD = 2.02$, range 14–20 years). All participants were Caucasian. No participants received incentives. Regarding education level, 98.5% of participants attended high school, and 1.5% were just graduated ($n = 6$ who were 20 years of age). In Italy, high school lasts 5 years (age of students: 14 to 19).

We also explored other demographic characteristics (i.e. maternal education level, paternal education level, and family income). With reference to maternal education level, 6.5% had a primary education or no educational degree, 34.7% had a middle school education,

1 36.5% had a secondary education, 17.6% had a degree, and 4.7% had a post-degree. Differ-
2 ences among the categories of this variable were significant [$\chi^2 = 296.81 (4), p < .001$].
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4 With reference to paternal education level, 4.1% had a primary education or no educa-
5 tional degree, 43.0% had a middle school education, 37.2% had a secondary education,
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7 12.2% had a degree, and 3.5% had a post-degree. Differences among the categories were sig-
8 nificant [$\chi^2 = 191.07 (4), p < .001$].
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11 Finally, family income was calculated, asking the participants to place themselves on a
12 range of five categories: low, low to medium, medium, medium to high, and high. Percent-
13 ages were as follows, respectively: 15.3%, 19.6%, 42.9%, 20.3%, and 1.9%. Differences
14 among the categories were significant [$\chi^2 = 73.44 (4), p < .001$].
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26 *Procedure*

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31 The study took place in Palermo (Italy) between September 2016 and June 2017 and
32 involved a convenience sample. Three schools were contacted and agreed to participate; par-
33 ticipants were sourced from these school settings. Permission was obtained from the head-
34 master in each school to approach classes of adolescents.
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41 Students were asked to participate in a research study as volunteers, through a letter
42 from the headmaster addressed to their parents. Students who did not give consent, went out
43 from the classroom and participated in alternative activities. Since many participants were
44 younger than the age of consent (18 years old), both parents gave informed consent, after ex-
45 planation of the objectives and procedure of the study. To this aim, the parents were given a
46 letter explaining the study, as well as the informed consent form. Further, since parental con-
47 sent alone is not sufficient for older children and young people (Spriggs, 2010), who must al-
48 so assent to participate, participants were also required to understand the objectives and pro-
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cedure of the study, and their participation had to be voluntary. If the students were of full legal age, they gave consent by themselves.

We had to go to two schools once each to recruit the students, whereas in the third school we had to go twice, because classes could not be sampled in a only one time; hence, four questionnaire administration sessions were overall required to obtain the student group. During class time and in groups of 25-30, students received a brief explanation of the purpose of the study and then completed measures in class. Students' questionnaires were administered by trained clinical psychology students or trained psychologists. Six graduated students (all of full legal age) were recruited as they happened to be at school for various reasons (e.g. asking for documents/certificates) during the questionnaire administrations. Finally, researchers gave the students and their parents the possibility to call the Department of Psychology for subsequent information about the research.

Measures

The Depressive Experiences Questionnaire for Adolescents. The Depressive Experiences Questionnaire for Adolescents (DEQ-A; Blatt, Schaffer, Bers, & Quinlan, 1992) is a 66-item self-report questionnaire, in which items are scored on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The original factor weight coefficients were used in the present study (Blatt, D'Afflitti, & Quinlan, 1976). The DEQ-A scoring program yields three scales: dependency, self-criticism, and efficacy. In the present study, the self-criticism and dependency scales were only considered. In this sample, internal consistency was found to be moderate to good ($\alpha_{dep} = .61$; $\alpha_{sc} = .82$). The Italian version of the DEQ-A, as well as the adult version (DEQ; Falgares et al., 2017), was developed using the back-translation method. No items were eliminated or significantly adjusted during the translation

1 process (Van de Vijver & Hambleton, 1996). Since the α value of dependency was too low to
2 be considered to have good reliability, we removed this variable from the analyses and fo-
3 cused only on self-criticism.
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7 *The Youth Self-Report 11/18.* The Italian version (Pastorelli et al., 2002) of the Youth
8 Self Report (YSR; Achenbach, 1991) was administered in order to measure internalizing and
9 externalizing symptoms. The scale contains 112 items covering behavioral, emotional, and
10 social problems that occurred during the past 6 months. Respondents are asked to rate the oc-
11 currence of problems on a 3-point scale. The YSR can be scored along syndrome scales:
12 Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought
13 Problems, Attention Problems, Aggressive Behavior, and Rule-Breaking Behavior. The In-
14 ternalizing scale can be derived from the first three syndrome scales (in the present study
15 Cronbach's alpha = .87), and the Externalizing scale from the last two (in the present study
16 Cronbach's alpha = .82).
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31 *The Attachment Style Questionnaire.* The Italian version (Fossati et al., 2003) of the At-
32 tachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan 1994) was used. It is a 40-
33 item self-report scale containing 5 subscales that assess two second-order factors: (a) insecure
34 anxious attachment (via the Need for approval and the Preoccupation with relationships sub-
35 scales), and (b) insecure avoidant attachment (via the Confidence, Discomfort with closeness,
36 and Relationships as secondary subscales). Confidence loads on the avoidant subscale, but in
37 the opposite direction of the other two scales.
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48 The factor structure has been reproduced among various community and psychiatric
49 samples (see Mikulincer & Shaver, 2007). All items are rated on a 6-point Likert-type re-
50 sponse format from 1 (totally disagree) to 6 (totally agree). In the current study, the 10-item
51 Discomfort with closeness, the 8-item Confidence (in self and others) and the 8-item Rela-
52 tionships as Secondary subscales were used as indicator variables for the attachment avoid-
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ance latent factor; whereas the 7-item Need for approval and the 7-item Preoccupation with relationships subscales were used as indicator variables for the attachment anxiety latent factor. The Cronbach alpha reliability coefficients for the five subscales ranged from .62 for Confidence in Self and others to .76 for Need for Approval.

Data Analysis

Data analyses were conducted using the statistical package for the social sciences (IBM SPSS Statistics 22.0; Armonk, NY, U.S.A.). After verifying the univariate normality of the distributions using the Skewness and Kurtosis indices and examining univariate outliers (z scores > 3), the Kurtosis multivariate Mardia coefficient was used to test the multivariate normality between the variables (Mardia, 1970). Missing data for one or more variables were replaced with the mean score of the scale where they did not exceed 20%; if missing data exceeded this cut-off, they were not used for statistical analyses. Descriptive statistics were computed for all socio-demographic and study variables. Pearson's bivariate correlation coefficients were computed to assess associations between variables. Associations between the socio-demographic variables and the study variables were analyzed to select the appropriate covariates for introduction into the model (Tabachnick & Fidell, 2007).

Structural equation modeling (SEM; Hoyle & Smith, 1994) was used to test hypotheses as it can evaluate *a priori* models, identify mediators, and elucidate direct and indirect paths. The SEM analyses were performed with the AMOS software (Version 22.0; Arbuckle, 2013), using the maximum-likelihood method.

First, a measurement model was examined, consisting of six inter-correlated latent factors. To measure a latent variable in the model (i.e. self-criticism), item parcels were created following the recommendations of Little, Cunningham, Shahar, and Widaman (2002). For

1 self-criticism scale, items were randomly assigned to parcels. This approach has been used
2 for the DEQ subscales in adolescents (Kopala-Sibley, Zuroff, Hermanto, Joyal-Desmarais,
3 2015).
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7 Then, a full structural model (Model 1) was fit to the data. This model included all hy-
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Then, a full structural model (Model 1) was fit to the data. This model included all hypothesized relations and corresponded to the model shown in Figure 1. Subsequently, a series of model comparisons was conducted. Multiple nested models, gradually moving towards more complex models, were fit. In these, individual relations were dropped from the model (constrained to equal zero). If the overall fit indices of a restricted model show a significant decrease in model fit (using the χ^2 difference test), this signals that the eliminated relation should be included in the model. Model 2 refers to a model in which the mediating effects of self-criticism on psychopathological symptoms were constrained to equal zero (i.e. attachment dimensions were directly related to the outcome variables), whereas Model 3 refers to a partially mediated model in which the direct path between attachment anxiety and internalizing problems, on one hand, and the direct path between attachment avoidance and externalizing problems, on the other, were constrained to equal zero.

Regarding SEM analyses, in addition to the overall χ^2 test of exact fit, as suggested by Browne and Cudeck (1993) and Hu and Bentler (1999), the following fit indices were used to evaluate the proposed models: (CFI; values of .90 or greater are acceptable), the standardized root-mean-square residual (SRMR; values of .06 or less are desirable), and the root-mean-square error of approximation (RMSEA; values of .08 or less are considered to be reasonable).

The mediational hypotheses were assessed by performing bootstrap analyses that simulated 5,000 samples (Preacher & Hayes, 2008). When using this procedure, an indirect effect is significant if zero is not contained within the 95% confidence interval.

Finally, the invariance across gender was examined in this model to determine whether

1 gender might serve as a moderator variable related to the main analyses. A multiple-group
2 analysis was conducted to check whether effects were equivalent across females and males
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4 (Byrne, 1998).
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9 **Results**

10 *Preliminary analyses and descriptive statistics*

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19 Of the 469 initial respondents, 28 were eliminated because they were not completed (N
20 = 15) or because there were univariate ($N = 13$; z scores > 3) outliers. Screening for multivar-
21 iate outliers (score exceeding the Kurtosis multivariate Mardia coefficient critical value,
22 equal to 288 for 16 observed variables), resulted in the exclusion of 21 participants. The final
23 Mardia coefficient was equal to 287.74. Tables 1 and 2 present the descriptive statistics and
24 correlations between, respectively, the study variables in the original sample, and the SEM
25 latent variables.
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44 The associations of all demographic variables (age, parental education level, and family
45 income) were examined and few significant relations were found with key study variables.
46 Age was related to few variables and the highest correlation was with self-criticism ($r = .23$,
47 $p < .001$). Results also showed some significant gender differences at a mean level. Particular-
48 ly, males were higher in confidence ($p = .001$), whereas females were higher in all the other
49 observed variables ($ps < .05$).
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58 With reference to maternal education level, there were significant differences across
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1 categories in need for approval [$\chi^2(4, N = 420) = 13.28, p < .05$], preoccupation with rela-
2 tionships [$\chi^2(4, N = 420) = 12.07, p < .05$], anxious/depressed [$\chi^2(4, N = 420) = 10.41, p <$
3 $.05$], somatic complaints [$\chi^2(4, N = 420) = 10.66, p < .05$], and aggressive behavior [$\chi^2(4, N$
4 $= 420) = 14.27, p < .01$]. Regarding paternal education level, significant differences across
5 categories were found in confidence [$\chi^2(4, N = 420) = 11.12, p < .05$], discomfort with
6 closeness [$\chi^2(4, N = 420) = 11.71, p < .05$], rule-breaking behavior [$\chi^2(4, N = 420) = 19.17,$
7 $p < .01$], and aggressive behavior [$\chi^2(4, N = 420) = 18.20, p < .01$]. Finally, family income
8 did not influence any key variables.

9 Then, the invariance of the measurement model across genders was examined. First,
10 configural and dimensional invariance were tested, fitting the model separately to males and
11 females. Both models indicated acceptable fit indices [males: $\chi^2 = 42.68(55), p = .89,$
12 RMSEA = .00 (90% CI = .000; .027), CFI = 1.00, SRMR = .04; females: $\chi^2 = 109.66(55), p$
13 $< .001,$ RMSEA = .06 (90% CI = .042; .074), CFI = .96, SRMR = .04].

14 Further, both metric and scalar invariance were investigated. Two models (a freely es-
15 timated model and a constrained model) were used to determine whether the measurement
16 model was the same across gender. This constrained model did not yield a significantly dif-
17 ferent fit than the unconstrained model, $\Delta\chi^2(36, N = 419, p = .08) = 48.54$. Thus, subsequent
18 analyses were conducted on the entire sample.

19 *Self-criticism as mediator between attachment dimensions and Internalizing and Exter-*
20 *nalizing problems*

21 The measurement model showed an acceptable model fit [$\chi^2 = 122.86(55), p < .001,$
22 RMSEA = .05 (90% CI = .041; .067), CFI = .96, SRMR = .04]. The hypothesized structural
23 model (Model 1; see Figure 1) included all study variables; gender, age, and parental (both
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1 maternal and paternal) education levels were added as covariates. In the sample, despite a
2 significant chi-square ($\chi^2 = 217.03 (92), p < .001$), fit indices (RMSEA = .06 (90% CI =
3 .047; .067), CFI = .96, SRMR = .05) revealed that this model had an acceptable fit. Moreo-
4 ver, nested model comparisons showed that Model 1 was the best fitting (see Table 3). Medi-
5 ation analyses were conducted on Model 1, given this was the best fitting (see Table 4).
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24 In Model 1, a significant association was also found between attachment avoidance and
25 self-criticism ($B = .00, \beta = .70, p = .001$). Furthermore, self-criticism was significantly asso-
26 ciated with internalizing ($B = 89.13, \beta = .38, p = .01$), but not with externalizing problems (B
27 $= 38.05, \beta = .24, p = .10$). A significant association was found between attachment anxiety
28 and self-criticism ($B = .00, \beta = .18, p = .02$).
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36 The mediation hypotheses were partially confirmed. The indirect effect of attachment
37 avoidance on internalizing problems through self-criticism ($beta = .27$ [95% CI: .06, .30], $p =$
38 .01) was significant, but on externalizing problems ($beta = .17$ [95% CI: -.04, .35], $p = .08$)
39 was not. The indirect effect of attachment anxiety on internalizing problems through self-
40 criticism ($beta = .07$ [95% CI: .01, .12], $p = .02$) was significant, but on externalizing prob-
41 lems ($beta = .04$ [95% CI: -.00, .13], $p = .06$) was not.
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53 Discussion 54 55 56 57

58 The current results partially support the expected mediation effects of self-criticism in
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1 the relationship between attachment anxiety and avoidance and internalizing and externaliz-
2 ing problems. Taken together, results suggest a potential link between attachment style di-
3 mensions, self-criticism, and psychopathological outcomes, such that self-criticism may rep-
4 resent a vulnerability factor mediating the relationship between anxious and avoidant attach-
5 ment and internalizing problems.
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11 *Attachment avoidance, personality vulnerability, and psychopathology symptoms*

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19 Consistent with hypotheses, elevated attachment avoidance predicted greater self-
20 criticism, which in turn was associated with higher levels of internalizing, but not externaliz-
21 ing symptoms. It is possible that individuals with higher levels of attachment avoidance, who
22 have a negative internal working model of others, could develop a more self-critical personal-
23 ity style because they tend to internalize others' rejection and may develop self-critical be-
24 liefs as a coping mechanism to deal with rejection (e.g., (e.g., being hard on oneself to help
25 one become more ideal and worthy of love). They may also protect themselves against antic-
26 ipated rejection by not relying on others. Moreover, individuals with high levels of self-
27 criticism could, in turn, become vulnerable to internalizing problems, but not externalizing
28 problems, when an achievement goal (i.e. to avoid disapproval and loss of control and auton-
29 omy) is not reached, although this is speculative, and we are not aware of any research that
30 has directly tested this specific possibility.
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48 In this study attachment avoidance directly predicted externalizing symptoms, although
49 attachment anxiety did not. A possible explanation is that, in order to avoid close interper-
50 sonal relationships, adolescents with avoidant attachment patterns act out (i.e. they are impul-
51 sive, inattentive, aggressive, etc.) in order to "push" others away. This would be consistent
52 with Muris et al.'s (2003) suggestion that avoidantly attached youth may be disposed to ex-
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1 ternalizing problems because they adopt strategies to minimize their distress such as being
2 hostile and defensive towards others in order to avoid close attachment relationships. These
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4 results are also consistent with prior research that has found significant associations of
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6 avoidant attachment with externalizing behaviors (Ramos et al., 2016; Nishikawa et al.,
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8 2010), although other studies have not found such an association (Brumariu & Kerns, 2010;
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10 Lacasa et al., 2015). Thus, further research is likely needed into the associations between at-
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Attachment anxiety, personality vulnerability, and psychopathology symptoms

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Nevertheless, alternative causal relationships could be hypothesized. Brenning et al. (2013) tested a longitudinal mediational model in which more general personality traits predicted attachment anxiety and avoidance, which in turn predicted depressive symptoms (see also Sibley, 2007). To better clarify these aspects, further studies examining longitudinal associations between depressogenic personality traits, attachment style dimensions, and psychopathology are required.

However, if results should prove robust in longitudinal research, the current results are in line with previous studies (see Campos et al., 2014) when considering bivariate correlations in that self-criticism correlated with internalizing and externalizing problems as measured by the YSR (Kuperminc, Blatt, & Leadbeater, 1997; Leadbeater, Kuperminc, Blatt, & Hertzog, 1999). Results also build on these prior studies by examining multiple independent and dependent variables, thereby adjusting for the effects of each. Differences in these results, compared to those found in prior research may be due to the current study having simultaneously examined multiple independent and dependent variables, as opposed to prior studies examining only bivariate associations (e.g. Besser & Priel, 2003; Campos et al., 2014; Rönnlund & Karlsson, 2006).

Limitations

This study also has several limitations which are important to note. First, the use of only self-report measurements may have inflated effects due to shared method variance. Secondly, as discussed above, the study is also limited by its cross-sectional nature from which the direction of relationships cannot be established.

Third, the internal consistency coefficients for some of the scales are low. The internal consistencies for the ASQ subscales are lower than those reported for the original ASQ

1 (Feeney et al.,1994), but are very similar to the Italian validated version (see Fossati et al.,
2 2003). Dependency was also not examined here because it showed low internal consistency.
3

4 Fourth, although not a limitation per se, a relatively brief assessment of attachment
5 style dimensions was used which gives a continuous score of attachment insecurity rather
6 than categorical styles. While it derives indices of Anxious and Avoidant style dimensions,
7 examining attachment styles categorically may yield further insights into the relations be-
8 tween attachment styles and psychopathology in youth.
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10 Finally, a community sample was used. Although this approach carries many ad-
11 vantages for the study of developmental psychopathology (Willett, Singer, & Martin, 1998),
12 it is unclear how results would generalize to clinical populations. Further study of the asso-
13 ciations between the constructs studied here in children and youth with clinical ranges of in-
14 ternalizing and externalizing problems is warranted.
15

16 Despite the limitations of this study, results provide empirical support for the proposed
17 theoretical model. This study demonstrates that adolescent attachment style dimensions are
18 related to elevations in the personality trait of self-criticism, which in turn partially accounts
19 for the associations between anxious and avoidant attachment and internalizing, but not ex-
20 ternalizing symptoms. These findings could provide valuable information both for research-
21 ers investigating an increasing number of factors in their conceptualization and research on
22 psychopathology in youth and for clinical professionals interested in understanding the de-
23 velopmental origins of personality factors in order to inform interventions aimed at identify-
24 ing those at risk for the development of a vulnerable personality style prior to the onset of a
25 diagnosable disorder (Kopala-Sibley, Klein, Perlman, & Kotov, 2017).
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58 Conflicts of interest
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Table 1. Means, Standard Deviations, and Intercorrelations of Observed Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Confidence	31.01	5.40	—									
2. Discomfort with closeness	42.52	7.93	-.55***	—								
13. Relationships as secondary	21.32	4.88	-.49***	.64***	—							
24. Need for approval	22.12	7.12	-.31***	.19***	.24***	—						
35. Preoccupation with relationships	29.73	7.03	-.30***	.21***	.27***	.49***	—					
46. Self-criticism	-.23	1.16	-.52***	.49***	.45***	.31***	.36**	—				
57. Anxious-depressed	8.15	4.56	-.47***	.36***	.34***	.32***	.35***	.52***	—			
68. Withdrawal-depressed	5.40	3.05	.41***	.34***	.34***	.34***	.28***	.43***	.51***	—		
79. Somatic complaints	5.17	3.34	-.36***	.25***	.29***	.20***	.21***	.38***	.53***	.44***	—	
810. Rule-breaking behavior	5.04	3.50	-.22***	.33***	.28***	.06	.08	.28***	.19***	.25***	.16***	—
911. Aggressive behavior	9.68	4.78	-.30***	.37***	.31***	.10*	.16**	.40***	.37***	.32***	.31***	.64***

10 Note. Intercorrelations are presented below the diagonal (*n* = 420).

11 **p* ≤ .05; ***p* ≤ .01; ****p* ≤ .001.

Table 2. Summary of Intercorrelations, Means, and Standard Deviations of Latent Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Attachment avoidance	.00	5.83	—			
2. Attachment anxiety	.00	4.82	.49***	—		
3. Self-criticism	.00	.00	.75***	.55***	—	
4. Internalizing	.00	3.54	.61***	.58***	.68***	—
5. Externalizing	.00	2.24	.49***	.18*	.45***	.47***

23 Note. Intercorrelations are presented below the diagonal (*n* = 420).

24 **p* ≤ .05; ***p* ≤ .01; ****p* ≤ .001. *N* = 420.

Table 3. Fit Indices for Nested Sequence of Cross-Sectional Models

Model	<i>df</i>	χ^2	CFI	RMSEA	SRMR	χ^2 Difference (assuming Model 1 to be correct)
1. Partial mediation	92	217.03	.95	.06	.05	
2. Dependency and self-criticism were dropped from the model	99	524.36	.85	.10	.18	307.34*
3. Drop path from attachment anxiety to internalizing and from attachment avoidance to externalizing	94	251.73	.94	.06	.05	34.70*

35 Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root-mean-square residual. Results are controlled for gender, age, paternal and maternal education level.

36 **p* ≤ .001.

Table 4. Exploratory mediator model with the attachment dimensions as IVs, self-criticism as MV and the Internalizing/Externalizing problems as DVs (5,000 Bootstrap Samples)

<i>MV</i>	<i>a</i>	<i>b</i>	<i>c'</i>	<i>c</i>
IV = Attachment avoidance; DV = Internalizing				
SC	.70***	.38**	.28*	.55***
IV = Attachment anxiety; DV = Internalizing problems				
SC	.18*		.21*	.28**
IV = Attachment avoidance; DV = Externalizing				
SC		.24(*)	.36**	.53***
IV = Attachment anxiety; DV = Externalizing problems				
SC			-.11	-.07

57 Note. IV, independent variable; DV, dependent variable; MV, mediator variable; SC, Self-criticism. *a* = effect of IV on MV. *b* = effect of MV on DV. *c'* = direct effect. *c* = total effect.

62 (*)*p* ≤ .10, **p* ≤ .05, ***p* ≤ .01, ****p* ≤ .001.

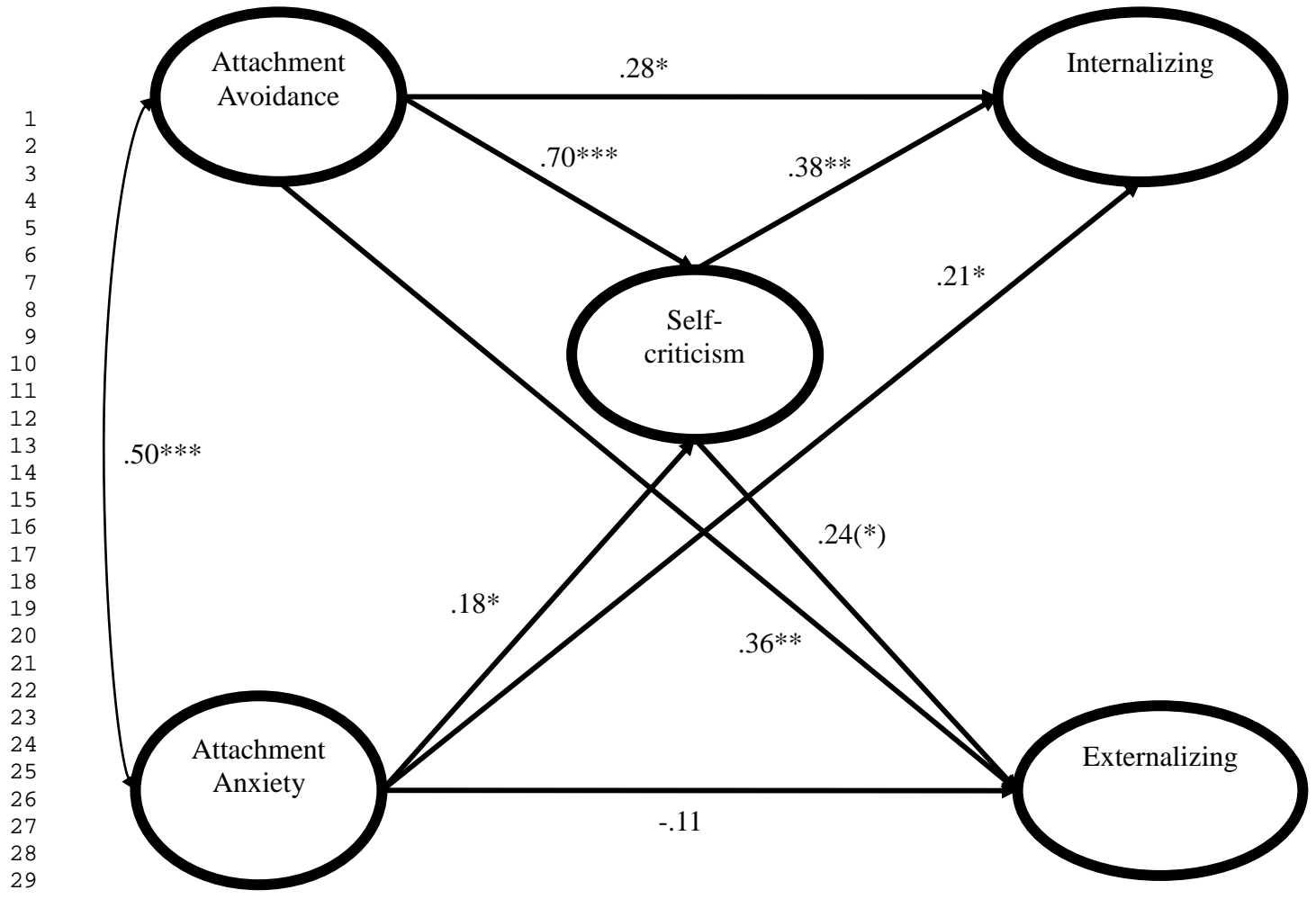


Figure 1.

Partially mediated Path Model (Model 1). Standardized path coefficients are presented.

(*) $p < .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

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Running Head: Attachment styles and Internalizing and Externalizing problems: the mediating role of Self-criticism

The relationship between attachment styles and internalizing/externalizing problems: the mediating role of self-criticism

Full research article

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Comments for the Author:

Reviewer #1: The second revised version of the manuscript titled "The relationship between attachment styles and internalizing/externalizing problems: the mediating role of self-criticism" is an improved version of the previously submitted revision. However, I still found that some issues continue to remain problematic, even after this revision.

1. It is quite disheartening to still find one sentence paragraphs although repeated suggestions have been made to correct this issue. For instance, on pg 3 the paragraph starting on ln 31 contains one phrase, and therefore should be connected to the previous paragraph and not placed separately. This issue is also apparent on pg 5, where sentences/phrases starting with ln 36, 41 and 51 should be part of the same paragraph. The same problem still arises in several places in the Results section.

Thank you for catching these. We have fixed these errors and have examined the manuscript to ensure there are no paragraphs that contain only one sentence. Please note that phrases in all italics are meant and subheadings within the introduction, and therefore should not be part of other paragraphs.

2. The conceptual framework of the current study although improved, still lacks sufficient clarity. For instance, the Authors argue that from a developmental point of view, during adolescence personality develops as well as increased risk of depression. This argument can only justify testing the relationship between personality traits and internalizing problems, but not externalizing ones (as rates of externalizing problems actually drop during adolescence). In my review I was actually asking the Authors to take into account why the parent-child attachment relationship might be relevant for the development of adolescents' personality traits, as it is known that internal working models developed during parent-child interactions may shape the way children process emotional stimuli, their thinking patterns, as well as their behaviors in social interactions. Considering this aspect it would then make sense to argue that certain personality traits could be responsible for predisposing adolescents to psychopathology.

Thank you for this point and allowing us to further expand our rationale. We have added the following on pp.2-3:

Moreover, attachment styles largely develop out of the parent-child relationship, and the internal working models that stem from these relationships likely influence the development of adolescents' personality traits, including self-criticism. Indeed, in their review, Kopala-Sibley and Zuroff (2014) conclude there is a robust relationship between maladaptive parenting and the development of personality traits in adolescence that confer vulnerability to psychopathology, including both internalizing and externalizing symptoms. As such, understanding the links between early attachment styles, adolescents' personality traits, and internalizing and externalizing symptoms is important.

Reviewer #3: I think that the authors have made an honest effort to address the concerns and the manuscript has improved. The sample size and the data analysis are solid so I recommend

acceptance.