

Maladaptive Personality Traits and Psychopathology in Childhood and Adolescence: The Moderating Effect of Parenting

Barbara De Clercq, Karla Van Leeuwen, Filip De Fruyt,
Alain Van Hiel, and Ivan Mervielde

Ghent University

ABSTRACT This study examines child and adolescent psychopathology from a maladaptive trait perspective, incorporating both parental and child ratings of parenting as a moderator of the personality-psychopathology association. Hierarchical moderated regression analyses were conducted on a combined sample of referred and nonreferred children and adolescents ($N = 862$, parental ratings of parenting and $N = 396$, child ratings of parenting). The results indicated positive main effects of maladaptive traits on externalizing and internalizing problems, and positive main effects of parental negative control on externalizing problems. Significant interactions were found for Disagreeableness and Emotional Instability with parental Negative Control and for Disagreeableness \times Positive Parenting in explaining externalizing problems. The discussion focuses on the contribution of these findings to a better understanding of the trait-psychopathology relationship at young age.

Child temperament/personality factors and parenting styles or behaviors have been frequently found to be associated with the development of child psychopathology (Nigg, 2006; Putnam, Sanson, & Rothbart, 2002; Rettew & McKee, 2005; Rothbart & Bates, 2006). This study, the first to broaden the trait perspective on psychopathology towards the maladaptive side of personality at the

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Correspondence concerning this article should be addressed to Barbara De Clercq, Department of Developmental, Personality and Social Psychology, Ghent University, H. Dunantlaan 2, B-9000 Ghent, Belgium. E-mail: BarbaraJ.DeClercq@ugent.be.

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age of childhood, examines whether and how child problem behavior is influenced by trait-like characteristics of psychopathology observable at young age. The trait-psychopathology relationship is described from a multivariate perspective (Tackett, 2006), relying on a comprehensive set of hierarchically organized maladaptive traits (De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006) that are hypothesized to represent developmental manifestations of personality disorder pathology. The design further explores the moderating role of parental behavior, directly building upon the notion that the fit between a child's temperament and the environmental context influences adaptive and maladaptive developmental outcomes (Thomas, Chess, Birch, Hertzog, & Korn, 1963) and incorporating Shiner's recommendation to include environmental measures (Shiner, 2005) when studying the relation between temperament or personality and psychopathology. The study, which may contribute to the identification of trait-psychopathology associations within the framework of maladaptive personality, investigates the strength of maladaptive traits for the prediction of child psychopathology by taking into account the moderating influence of parental behavior.

Child Personality Traits and Psychopathology

Early individual differences have been traditionally conceived in terms of temperamental characteristics (for a review of models, see Mervielde & Asendorpf, 2000), whereas more stable trait-like differences observable later in life have been described as personality traits. Although temperamental features appear from birth onward and are presumed to have stronger biological roots than personality traits, Caspi, Roberts, and Shiner (2005) recently argued that temperament dimensions and the personality traits exemplified in the Five-Factor Model (FFM; McCrae & Costa, 1999) share substantial features and are thus much more alike than assumed previously.

The long-term continuity of these individual differences from early childhood to adolescence (Abe, 2005), and even from childhood to adulthood (Caspi, 2000; Caspi & Roberts, 2001; Roberts & Del Vecchio, 2000), has been convincingly demonstrated, further indicating that early personality characteristics shape processes of adaptation (Shiner, Masten, & Roberts, 2003) and maladaptation (Caspi, 2000; Caspi et al., 2003) over time. Moreover, there is

growing evidence for childhood-onset psychopathology to evolve in more maladaptive pathways compared to adolescent-onset psychopathology (Tackett, 2006). In this respect, Frick et al. (2003) argue that early onset psychopathology includes a larger trait component, supporting the relevance of studying the relationship between traits and psychopathology at young age. From this trait perspective on the developmental course of psychopathology, the chronic nature of child psychopathology (Tackett, 2006), indeed, may suggest the presence of enduring trait characteristics that make some children more likely to experience stable forms of externalizing or internalizing psychopathology than others.

Within the externalizing spectrum, dysfunctional behavior such as aggressive and delinquent behavior, can be related to the concept of "difficult temperament" (Tackett, 2006), with the FFM traits of low Conscientiousness, low Benevolence, and high Neuroticism (Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Prinzie et al., 2003; Tackett, 2006; Van Leeuwen, Mervielde, Braet, & Bosmans, 2004), early childhood impulsivity (Leve, Kim, & Pears, 2005; Tackett, 2006) and lack of self-control or disinhibition (Tackett, 2006).

Considering child internalizing problems, substantial linkages of anxiety, shyness, and emotional reactivity to novel stimuli (Colder, Mott, & Berman, 2002; Kagan, Snidman, Zentner, & Peterson, 1999; Leve et al., 2005; Prior, Smart, Sanson, & Oberklaid, 2000) with internalizing problems have been described. Also, the FFM traits Emotional Instability or Neuroticism and Introversion (Van Leeuwen et al., 2004), and the personality construct Behavioral Inhibition (Tackett, 2006) are significantly associated with (later) internalizing problems. Extending the application of the tripartite model (Clark & Watson, 1991) to children and adolescents, Lonigan, Vasey, Philips, and Hazen (2004) posit that children with both anxiety and depression have a common personality profile of high Neuroticism and low Conscientiousness.

So far, the associations between child psychopathology and personality have been mainly addressed from normal trait variation, with only few researchers focusing on the role of specific maladaptive traits in childhood (see for example Salekin & Frick, 2005). The present study introduces a more comprehensive perspective on maladaptive personality at young age, exploring broad maladaptive trait-psychopathology associations from an age-specific approach. The maladaptive trait description relies on the Dimensional

Personality Symptom Itempool (DIPSI; De Clercq et al., 2006), developed within the search for a dimensional representation of personality disorder antecedents. The construction procedures of the DIPSI are extensively described in De Clercq et al. (2006), resulting in the 172-item taxonomy that is organized in 27 lower-level facets, each representing a cluster of developmental maladaptive trait symptoms. The 27 facets are structured in four higher-order dimensions, i.e. Disagreeableness (including extreme low-end variants of Benevolence such as Dominance/Egocentrism and Irritable/Aggressive traits, high-end variants of Extraversion such as Hyperexpressivity and Hyperactivity, and low-end variants of Conscientiousness such as Distraction and Disorderliness), Emotional Instability (referring to both Anxious and Depressive traits, and also including a Dependency component), Introversion (describing extreme low-end variants of Extraversion, such as Withdrawn traits and Shyness), and Compulsivity (including the high extremes of Conscientiousness traits such as Perfectionism and Extreme Order). The nature of these four higher-order maladaptive trait factors is reflected in their correlations with normal-range personality traits (see De Clercq et al., 2006), representing the extremes of these traits and providing a more detailed description of pathological trait features that is not fully accounted for by general trait or temperamental models. The four-factor structure can further be represented within the common framework of the FFM (Markon, Krueger, & Watson, 2005), and at both the higher and lower level, the DIPSI structure is conceptually similar (De Clercq et al., 2006) to adult maladaptive trait models such as the DAPP-BQ (Livesley, 1990) and the SNAP (Clark, 1993).

Personality Traits and Psychopathology: Contamination of Measures

Historically, childhood studies on temperamental traits or personality and psychopathology have been conducted rather independently (Frick, 2004; Tackett, 2006). The integration of both research areas has been hampered by a number of issues, including the boundaries between disciplines that study temperament versus psychopathology, conceptual problems in defining the relationship between both constructs and possible item overlap between measures of each construct. A small number of researchers have addressed this last issue empirically and have demonstrated significant relationships

between child temperamental traits and psychopathology, even after controlling for measurement confounding between both constructs (Lemery, Essex, & Smider, 2002; Lengua, West, & Sandler, 1998; Oldehinkel, Hartman, De Winter, Veenstra, & Ormel, 2004). However, the problem of overlapping item content may especially hamper studies that focus on psychopathology from a maladaptive perspective on personality because both measures focus on pathological functioning.

Parental Behavior and Psychopathology

It is generally assumed that child psychopathology is not solely driven by intrinsic child factors but is also affected by environmental factors such as parental behavior. Several studies indicated that negative parenting in (young) children—such as inconsistent, harsh discipline strategies and limited warmth, lack of responsiveness or rejection—is a risk factor for persistent externalizing problems (Belsky, Hsieh, & Crnic, 1998; Rothbaum & Weisz, 1994). From a life-span perspective, Johnson et al. (2001) demonstrated that children who experienced maternal verbal abuse were more than three times as likely to develop borderline, narcissistic, obsessive-compulsive, and paranoid personality symptoms in adulthood, compared to children who did not experience this abuse. From a FFM perspective, Rogosch and Cicchetti (2004) showed that maltreated children were considered less agreeable, less conscientious, and less open to experiences compared to nonmaltreated children and that these differences remained stable across time.

Compared to the externalizing spectrum, fewer studies focused on the relation between parenting and child internalizing psychopathology. In their meta-analysis, Wood, McLeod, Sigman, Hwang, and Chu (2003) found observed parental control (operationalized as oversolicitous behavior, overprotection, and reduced granting of autonomy) to be consistently associated with shyness and child anxiety disorders across studies. Van Leeuwen and colleagues (2004) found main effects of high negative control (operationalized as restrictiveness in order to place limits on the child's behavior) and main effects of low positive parental behavior on child internalizing problems.

Beyond the main effects of personality traits and parental behavior on the child's maladjustment, it is very likely that an interaction

between traits and parenting (O'Connor, 2002; Thomas et al., 1963) explains the development of behavioral problems. Rothbart and Bates (2006) have described a number of temperament \times environment interactions, including interactions between temperamental fearfulness (inhibition) and parental control to account for the development of conscience (Kochanska, 1993), and between the temperament construct Lack of Control and a single-parent home to account for later criminal behavior (Henry, Caspi, Moffitt, & Silva, 1996). Prinzie and colleagues (2003) and Van Leeuwen and colleagues (2004) found significant interactions between parental negative control and the personality domains Benevolence and Conscientiousness for explaining externalizing problem behavior. These findings indicate that the effect of personality on a child's developmental outcome often depends upon environmental measures such as parenting. Frick (2004) therefore advocates that our understanding of childhood psychopathology would benefit from including measures of the child's context in the joint study of temperamental traits and psychopathology.

The present study addresses this suggestion and studies child psychopathology from both a maladaptive trait and parenting (represented by a negative, controlling parenting and a positive parenting dimension) perspective. Relying on hierarchical moderating regression analyses, we examine main effects of both childhood maladaptive personality traits (Disagreeableness, Emotional Instability, Introversion and Compulsivity) and parental behavior (Negative Control and Positive Parenting) on the broad internalizing and externalizing dimensions of psychopathology. We predict that both personality and parental behavior have important main effects on child psychopathology, with positive main effects of maladaptive traits and parental negative control and a negative main effect of positive parenting. We additionally consider parenting as a moderator of the personality-psychopathology association, thus focusing on how parental behaviors may act as risk or protective factors in the development of the child's (mal)adjustment (Putnam et al., 2002).

In line with previous studies, we specifically expect negative control to interact with maladaptive personality in explaining child psychopathology, with high levels of negative control enhancing the aversive effect of maladaptive traits on child psychopathology. It is furthermore hypothesized that positive parenting also shows

interactive effects, with a high level of positive parenting weakening the aversive effect of maladaptive traits on child psychopathology.

Before conducting the regression analyses, the present study empirically investigates item overlap between the maladaptive trait and psychopathology constructs relying on factor-analytic methods (Lengua et al., 1998) and explores whether maladaptive trait-psychopathology associations are valid or largely due to the contamination of predictor and criterion measures. We assume a significant number of overlapping items that confound the measurement of the trait and psychopathology constructs and expect the largest item overlap for the Disagreeableness-externalizing and Emotional Instability-internalizing combinations, given the previously found, strong correlations between these constructs (De Clercq et al., 2006).

METHOD

Participants

Nonreferred children and adolescents. Second- and third-year undergraduate psychology students of Ghent University recruited children and adolescents from the general population. Both samples are described separately, because of the differences in the number of administered questionnaires to the children and adolescents, respectively. The sample of children ($N = 193$) included 93 boys and 100 girls with a mean age of 10.82 years ($SD = 1.86$), ranging from 7 to 15 years (Sample 1). The early-adolescent sample ($N = 453$) consisted of 216 boys and 237 girls with a mean age of 13.9 years ($SD = 1.14$), ranging from 10.5 to 16.7 years (Sample 2). Almost all participants of both samples attended normal primary or secondary education, with only 1% attending special education for pupils with learning disabilities. The educational level of mothers of Sample 1 included secondary education (40.8%), higher nonuniversity education (49.7%), and university (9.4%), whereas 1.1% of the fathers followed primary education, 46% secondary education, 35.8% higher nonuniversity education, and 16% university. For Sample 2, the educational level of mothers and fathers included secondary education (73.3% and 65.5%, respectively), higher nonuniversity education (13.3% and 12.9%, respectively) and university education (13.3% and 21.4%, respectively).

Referred children. Two hundred and eighteen children who were consulting general mental health services served as the referred sample. Exclusion criteria were the presence of a physical disability or a condition

of chronic disease. Participants were recruited by third-year undergraduate psychology students of Ghent University by contacting a psychologist or psychiatrist from an online list with registered providers of mental care. Psychologists and psychiatrists randomly selected one of their clients, following the chronological order of their appointment schedule. Two hundred and five participants (this subsample is the same as the referred sample in De Clercq et al., 2006) consulted outpatient treatment programs in psychiatric clinics, pediatric units of hospitals, services for school counselling, private psychotherapy services, and psychomedical services for children with developmental and learning disorders, whereas 13 participants were enrolled in an inpatient treatment program at a pediatric psychiatric hospital. The children's mean age was 9.9 years ($SD = 1.93$), ranging from 5.2 to 14.6 years. The period of psychological treatment ranged from 0 to 56 months, with a mean duration of 10 months ($SD = 10.13$). The treating psychologist/psychiatrist provided information on the initial reason for counselling: 21.0% of the children had anxiety and depressive symptoms, 24.9% externalizing problem behavior (lying, aggression and temper tantrums), 15.6% exhibited enduring behavioral and emotional difficulties related to major stress events (divorce or decease of the parents), 6.8% struggled with psychosomatic complaints (pain without physical cause, eating and sleeping problems), 9.3% suffered from attention and concentration problems without neurological dysfunction, 11.2% demonstrated behavioral problems due to developmental disorders such as ADHD, Tourette syndrome and autism spectrum disorder, 8.3% showed withdrawn behavior or defective social skills, 1% exhibited obsessive-compulsive behavior, and 0.5% had symptoms of automutilation and suicidal thoughts. For 1.5% of the children, no information on the primary reason for referral was available. Almost all children attended normal primary education or kindergarten (86.8%), with 13.2% attending special education for pupils with learning disabilities. The educational level of mothers and fathers ranged from secondary education (89.1% and 77.5% respectively), higher nonuniversity education (11.4% and 8.8% respectively), and university degree (13.7% and 8.5% respectively).

Procedure

Trained psychology students visited the samples of nonreferred children ($N = 193$) and adolescents ($N = 453$) at home, providing detailed oral and written instructions on how to complete the questionnaires. All mothers were administered three inventories: a measure of child maladaptive traits, a measure on child psychopathology, and a measure of parental

behavior. The children sample ($N = 193$) also supplied ratings on parental behavior.

Families of the referred sample ($N = 218$) were contacted via the treating psychologist or psychiatrist who introduced the study and subsequently asked both the child and the mother to participate. Mothers were requested to provide ratings on the same three inventories administered to the nonreferred samples. The children of the outpatient group ($N = 205$) also described parental behavior.

The instructions were similar for all samples and underscored that mother and child should complete the questionnaires independently. Participants were not assisted in order to guarantee that their independent opinion was assessed. Both mothers and children were assured that all information would be treated as confidential and would serve only research purposes. Written informed consent was obtained from all mothers and children and from the psychologists/psychiatrists at the moment of assessment.

Measures

Dimensional Personality Symptom Itempool for Children (DIPSI). All mothers rated their child on the DIPSI item pool (De Clercq et al., 2006), judging the applicability of the 172 items referring to concrete, trait-related symptoms. In the DIPSI, 27 maladaptive personality facets (for an overview, see De Clercq et al., 2006) are hierarchically organized in four dimensions, to be calculated as the mean scores of their facets. Disagreeableness includes items like “Manipulates other children repeatedly to have his way” (low-end Benevolence), as well as “Exhibits his/her inner feelings at all occasions” (high-end Extraversion) and “Never takes care of his/her belongings” (low-end Conscientiousness). Emotional Instability includes facets that refer to both Anxious and Depressive traits with sample items such as “Panics very easily” and “Feels often empty inside” and also includes a Dependency component represented by items like “Clings to other people” (item of the Insecure Attachment facet), “Needs someone around all the time” (Dependency item), and “Always submits to other children” (Submissiveness item). Introversion describes extreme low-end variants of Extraversion with sample items such as “Cannot express feelings of affection,” whereas Compulsivity represents the high extremes of Conscientiousness traits, including items such as “Wants life to be perfectly organized.”

The reliability analysis of the four higher-order maladaptive dimensions indicates good internal consistency across samples with alpha coefficients of .97 for Disagreeableness and .96 for Emotional Instability, .87 for Introversion, and .86 for Compulsivity. Alpha coefficients for the

27 facets range from .69 (Perfectionism) to .88 (Irritability, Affective Lability, and Disorderliness), with a median value of .83.

The Ghent Parental Behavior Scale (GPBS). The GPBS (Van Leeuwen & Vermulst, 2004) describes parental rearing behavior and consists of nine scales, hierarchically structured in two dimensions of parental behavior. The first factor represents the dimension of Negative Control (calculated as the mean score on the scales of Discipline, Ignoring of Unwanted Behavior, and Harsh Punishment) and the second factor describing Positive Parenting (calculated as the mean score on the scales Positive Parental Behavior, Teaching Rules, and Autonomy). During the construction phase, Van Leeuwen and Vermulst (2004) found the three remaining scales (Monitoring, Material Rewarding, and Inconsistent Discipline) did not consistently load on the same dimension and suggested they be dropped from the higher-order structure.

Both parental dimensions are strongly related to two constructs that are frequently mentioned in the literature on parental behavior (Gallagher, 2002; Maccoby & Martin, 1983), with “Negative Control” referring to efforts of parents to influence their child’s behavior, such as setting and enforcing standards of behavior (control or demandingness), and “Positive Parenting” describing the affective nature of the parent-child relationship (warmth or responsiveness, to be differentiated from overprotectiveness or oversolicitousness). Psychometric properties of the questionnaire were examined by Van Leeuwen and Vermulst (2004), indicating good internal consistencies for the scales and satisfactory confirmatory factorial validity. A self-report form is available for parents rating their own behavior, as well as a version for the child to describe the behavior of his/her parents. The reliability analysis on the present combined samples resulted in internal consistencies for parental ratings of $\alpha = .81$ (Positive Parenting) and $\alpha = .73$ (Negative Control), and $\alpha = .79$ (Positive Parenting) and $\alpha = .65$ (Negative Control) for child ratings.

The Child Behavior Checklist (CBCL). The CBCL (Achenbach, 1991; Verhulst, Van der Ende, & Koot, 1996) assesses child psychopathology, distinguishing eight syndrome scales (Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior), and two broadband scales (Internalizing and Externalizing Problems), aggregated in a total problem score. The CBCL syndrome scales have satisfactory Cronbach’s alpha coefficients for the combined sample, ranging from .65 (Thought Problems) to .93 (Aggressive Behavior), with a median value of .75, and alphas of .93 for the Externalizing and .91 for the Internalizing Problem scale.

RESULTS

Contamination of Measures

The empirical measurement confounding for each maladaptive trait (DIPSI) and psychopathology (CBCL) combination was examined adopting the factor analytic method described by Lengua and colleagues (1998). Item-level confirmatory factor analyses (Jöreskog & Sörbom, 1996) were conducted using Lisrel 8.5, relying on the maximum-likelihood algorithm with two correlated factors specified. We predicted the first factor to represent the maladaptive trait construct and the second factor the psychopathology construct, with all DIPSI items only loading on the first factor and all CBCL items only loading on the second factor. In addition, we hypothesized that any unique variance in a maladaptive trait item that was not explained by the trait factor was not related to unique variance in a psychopathology item. The following criteria were used to eliminate items: loadings greater than .30 on the nonintended factor, simultaneous loadings of greater or less than .30 on both factors, and items with item-error correlations $> .30$ across factors. Internal consistencies and correlations of the purified constructs were calculated and compared with the original dimensions, in order to test the reliability and the content validity of the decontaminated measures. All items were standardized, and correlations were corrected for attenuation as described by Lemery et al. (2002).

The results indicated that 17 Disagreeableness items were confounded with the Externalizing CBCL scale (three items with a loading $> .30$ on both factors, two items $< .30$ on both factors and 12 items with item-error correlations across factors $> .30$), whereas five CBCL items of the Externalizing scale were confounded with Disagreeableness (all five items loaded $< .30$ on both factors). The Disagreeableness scale was also confounded with the CBCL Internalizing scale, with two DIPSI items and four CBCL items showing lower loadings than .30 on both factors. Two items of the Emotional Instability factor showed overlap with the Externalizing scale of the CBCL (one item loaded $< .30$ on both factors and one loaded $> .30$ on the wrong factor), and three CBCL Externalizing items loaded $< .30$ on both factors. For the Emotional Instability-Internalizing analysis, only one DIPSI item (loading $< .30$ on both factors) and six CBCL items (four items loaded $< .30$ on both factors, and two items had high item-error correlations across factors) showed empirical

overlap. No DIPSI Introversion items were empirically confounded with the CBCL Externalizing or Internalizing scale, whereas three CBCL Externalizing items (loadings $< .30$) and seven CBCL Internalizing items (four CBCL items loaded $< .30$ on both factors, one CBCL item showed a high cross-loading on the Introversion factor and two CBCL items had high item-error correlations across factors) were confounded with Introversion. None of the Compulsivity items showed overlap with any of the CBCL scales, whereas two CBCL Externalizing (loading $< .30$ on both factors) and five CBCL Internalizing items (four low-loading items on both factors and one high-loading item on both factors) were confounded with the Compulsivity factor.

Purified Scale Characteristics

First, purified DIPSI and CBCL scales were constructed eliminating each of the confounding items for the scale in question. Cronbach's alphas were then calculated as a measure of interrelatedness for the set of items of the original constructs and subsequently for the purified constructs based on the factor-analytic results. The results showed almost unaffected Cronbach's alpha internal consistency coefficients for the purified DIPSI and CBCL scales compared to the original scales.

Pearson correlations were subsequently calculated between child problem behavior and personality scales for both original and purified scales (see Table 1). The statistical significance of the differences between the correlations of the original and purified scales was investigated with the z -statistic and associated p -value, demonstrating no significant differences in the associations between original and purified DIPSI and CBCL scales (see Table 1). Given these results, it was decided to use the original scales rather than the purified scales for the regression analyses, thus making the results directly comparable with other studies that focus on similar constructs. However, all regression analyses were repeated relying on the purified DIPSI and CBCL scales and confirmed the regression results as described later in the manuscript (a statistical report of these findings can be obtained from the first author).

Regression Results

We conducted hierarchical moderated regression analysis to detect significant interactions between maladaptive child personality and

Table 1
Correlations for Original and Purified Scales of Maladaptive Personality Traits and Psychopathology

	Internalizing Problems		Externalizing Problems		z_{int}	z_{ext}
	r_1	r_2	r_1	r_2		
DIPSI						
Disagreeableness	.34 ^a	.34 ^a	.69 ^a	.64 ^a		1.86
Emotional instability	.61 ^a	.62 ^a	.38 ^a	.39 ^a	-.33	-.24
Introversion	.48 ^a	.46 ^a	.29 ^a	.28 ^a	.53	.23
Compulsivity	.20 ^a	.21 ^a	.08 ^c	.08 ^c	-.22	

Note: Subscripts 1 and 2 refer to original and purified scales respectively. $z_{\text{int/ext}}$ = z -statistic for difference in correlation coefficients between DIPSI scales and Internalizing and Externalizing problems respectively.

^a $p < .001$. ^b $p < .01$. ^c $p < .05$.

parental behavior predicting child internalizing or externalizing problem behavior. All predictors were standardized (according to Aiken & West, 1991, pp. 43–44), i.e., Disagreeableness, Emotional Instability, Introversion, and Compulsivity for child maladaptive traits and Negative Control and Positive Parenting for parental behavior. As recommended by Bates (1989), the independent contributions (main effects) of personality and parenting to the outcome variable were assessed before addressing the interactive contributions (multiplicative effects). For each regression analysis, child gender and age were entered in Step 1 as control measures. In Step 2, one of the maladaptive personality variables and one of the two parenting variables were entered in order to examine independent effects of personality and parenting on child psychopathology. In Step 3, the interaction term was entered, defined as the cross-product of the same maladaptive personality trait and parenting dimension.

To increase the variability on the maladaptive personality dimensions and the power for detecting interactions, all analyses were conducted on the combined sample of 862 nonreferred and referred children and nonreferred adolescents (parental ratings), and the combined sample of 396 nonreferred and referred outpatient children

(child ratings of parenting). Before running the regressions, the intercorrelations among the predictor and criterion variables were explored.

As suggested by Berry (1993), the underlying assumptions of regression analysis were tested, using the guidelines of Field (2000). First, a test of the collinearity diagnostics in SPSS (the variance inflation factor and the tolerance statistic) indicated no multicollinearity between the predictors. Second, errors were found to be normally distributed and independent, with the residual terms having the same variance at each level of the predictors (homoscedasticity). We further controlled for outliers using casewise diagnostics in SPSS and examined influential cases (using the specific tests Cook's Distance, Leverage, and Mahalanobis Distance). The results showed that no outliers substantially influenced the regression model. Finally, a linear relation between the predictors and the outcome variable was assumed.

Intercorrelations

Table 2 shows significant positive correlations between the maladaptive trait dimensions and the two dimensions of psychopathology,

Table 2
Intercorrelations of Predictor and Criterion Variables

	DIS	INS	ITR	COM	POS	CON	POS-K	CON-K	INT
Maladaptive traits									
DIS									
INS	.58 ^a								
ITR	.54 ^a	.63 ^a							
COM	.27 ^a	.45 ^a	.37 ^a						
Parental behavior									
POS	-.07 ^c	-.04	-.10 ^b	-.00					
CON	.32 ^a	.12 ^a	.20 ^a	.01	-.03				
POS-K	.04	.12 ^c	.02	.09	.30 ^a	-.07			
CON-K	.37 ^a	.18 ^a	.18 ^a	.13 ^c	-.05	.55 ^a	.04		
Child psychopathology									
INT	.34 ^a	.62 ^a	.46 ^a	.21 ^a	-.04	.18 ^a	.03	.20 ^a	
EXT	.67 ^a	.39 ^a	.35 ^a	.09 ^b	-.09 ^c	.35 ^a	-.01	.43 ^a	.57 ^a

Note: DIS = Disagreeableness; INS = Emotional Instability; ITR = Introversion; COM = Compulsivity; POS = Positive parenting; CON = Negative control; INT = Internalizing; EXT = Externalizing.

with especially strong correlations between Disagreeableness and Externalizing and between Emotional instability and Internalizing. The correlations between the parental dimensions and child psychopathology show significant correlations for Negative Control and almost no correlations for the Positive Parental Behavior dimension. Parent and child ratings of parental behavior converge significantly, with $r = .30$ for Positive Parental Behavior and $r = .55$ for Negative Control.

Gender and Age Effects

Tables 3 and 4 report the hierarchical moderated regression analyses for externalizing and internalizing problem behavior. In the first step, we wanted to control for gender and age effects and entered only these two variables as predictors, resulting in a significant proportion of explained variance for externalizing and internalizing behavior in the model of parental ratings of parenting and to a lesser extent in the model of child ratings of parenting. These results indicate that boys present more externalizing behavior than girls, whereas girls present more internalizing problems compared to boys and that children show less externalizing and internalizing behavior with increasing age. This latter effect would probably disappear or reverse if the sample also included referred adolescents.

Main Effects of Personality Pathology and Parental Behavior

In the second step, child maladaptive personality characteristics and parental Negative Control (child and parental ratings) both demonstrated to be significant predictors of child externalizing behavior, with Disagreeableness having a substantially larger effect than both child- and parental-rated Negative Control. The effects of Negative Control and child emotional instability/Introversion were rather similar, whereas regressing externalizing problems on Negative Control and Compulsivity demonstrated that Negative Control (both child and parental ratings) is a stronger predictor for externalizing problems compared to Compulsivity. Positive Parental Behavior showed only small or no effects on externalizing problem behavior for both parental and child ratings.

The main effects of personality and parenting in explaining internalizing problem behavior showed that child- and parental-rated

Table 3
Hierarchical Regression Analyses Predicting Externalizing Problem Behavior From Maladaptive Traits and Parental Behavior

	Parental Ratings of Parenting (<i>N</i> = 862)			Child Ratings of Parenting (<i>N</i> = 396)		
	ΔF	R^2_{change}	B	ΔF	R^2_{change}	B
Negative control						
Sex, age	47.67 ^a	.10 ^a	-.10 ^c , -.09 ^a	14.88 ^a	.07 ^a	-.12, -.01
DIS, CON	364.54 ^a	.42 ^a	.58 ^a , .08 ^a	374.83 ^a	.61 ^a	.79 ^a , .15 ^a
DIS × CON	29.41 ^a	.02 ^a	.12 ^a	15.56 ^a	.01 ^a	.12 ^a
Sex, age	47.67 ^a	.10 ^a	-.27 ^a , -.07 ^a	14.88 ^a	.07 ^a	-.38 ^a , -.01
INS, CON	113.12 ^a	.19 ^a	.33 ^a , .24 ^a	98.19 ^a	.31 ^a	.44 ^a , .35 ^a
INS × CON	16.25 ^a	.01 ^a	.11 ^a	8.56 ^a	.01 ^a	.13 ^a
Sex, age	47.67 ^a	.10 ^a	-.20 ^a , -.10 ^a	14.88 ^a	.07 ^a	-.31 ^a , -.04
ITR, CON	96.02 ^a	.17 ^a	.30 ^a , .22 ^a	82.78 ^a	.28 ^a	.41 ^a , .36 ^a
ITR × CON	1.08	.00	.03	5.52 ^c	.01 ^c	.11 ^c
Sex, age	47.67 ^a	.10 ^a	-.26 ^a , -.09 ^a	14.88 ^a	.07 ^a	-.36 ^a , -.02
COM, CON	47.21 ^a	.09 ^a	.12 ^a , .27 ^a	50.07 ^a	.19 ^a	.26 ^a , .42 ^a
COM × CON	2.61	.00	.05	3.51	.01	.09
Positive parenting						
Sex, age	47.67 ^a	.10 ^a	-.10 ^c , -.11 ^a	14.88 ^a	.07 ^a	-.14 ^c , -.02
DIS, POS	357.38 ^a	.41 ^a	.64 ^a , -.05	365.54 ^a	.59 ^a	.86 ^a , -.05
*DIS × POS	8.86 ^a	.01 ^a	-.07 ^a	1.13	.00	-.03
Sex, age	47.67 ^a	.10 ^a	-.32 ^a , -.10 ^a	14.88 ^a	.07 ^a	-.50 ^a , -.05 ^c
INS, POS	76.14 ^a	.14 ^a	.36 ^a , -.07 ^c	60.01 ^a	.22 ^a	.50 ^a , -.06
INS × POS	.00	.00	.00	2.39	.00	-.06
Sex, age	47.67 ^a	.10 ^a	-.24 ^a , -.12 ^a	14.88 ^a	.07 ^a	-.45 ^a , -.08 ^a
ITR, POS	68.83 ^a	.13 ^a	.34 ^a , -.06	47.16 ^a	.18 ^a	.48 ^a , -.01
ITR × POS	.16	.00	-.01	3.52	.01	-.08
Sex, age	47.67 ^a	.10 ^a	-.33 ^a , -.12 ^a	14.88 ^a	.07 ^a	-.54 ^a , -.06 ^c
COM, POS	12.14 ^a	.03 ^a	.13 ^a , -.09 ^b	15.13 ^a	.07 ^a	.35 ^a , -.05
COM × POS	.13	.00	-.01	7.20 ^b	.02 ^b	-.16 ^b

Note: DIS = Disagreeableness; INS = Emotional Instability; ITR = Introversion; COM = Compulsivity; CON = Negative Control; POS = Positive Parenting.

^a $p < .003$. ^b $p < .01$. ^c $p < .05$, according to the Bonferroni correction; all predictors are standardized.

Coefficient B refers to the unstandardized regression coefficient calculated by the Friedrich procedure (Aiken & West, 1991, p. 44) and represents the appropriate standardized solution for use with multiplicative terms.

*This significant interaction was the result of a curvilinear nature of the regression model, and was no longer significant after controlling for this curvilinear relationship (Cohen, Cohen, West, & Aiken, 2003, pp. 299–300).

All analyses were also conducted controlling for referral status and showed no differences in main or interactive effects.

Table 4
Hierarchical Regression Analyses Predicting Internalizing Problem Behavior From Maladaptive Traits and Parental Behavior

	Parental Ratings of Parenting (N = 862)			Child Ratings of Parenting (N = 396)		
	ΔF	R ² _{change}	B	ΔF	R ² _{change}	B
Negative control						
Sex, age	47.79 ^a	.10 ^a	.20 ^a , -.13 ^a	3.41 ^c	.02 ^c	.36 ^a , -.02
DIS, CON	63.26 ^a	.11 ^a	.34 ^a , .01	58.69 ^a	.23 ^a	.52 ^a , .07
DIS × CON	.54	.00	.02	3.51	.01	-.09
Sex, age	47.79 ^a	.10 ^a	.06, -.10 ^a	3.41 ^c	.02 ^c	.13, .01
INS, CON	252.79 ^a	.34 ^a	.57 ^a , .06 ^c	268.20 ^a	.57 ^a	.76 ^a , .10 ^c
INS × CON	5.04 ^c	.00 ^c	.06 ^c	.56	.00	-.03
Sex, age	47.79 ^a	.10 ^a	.18 ^a , -.14 ^a	3.41 ^c	.02 ^c	.22 ^c , -.04
ITR, CON	158.48 ^a	.23 ^a	.51 ^a , .04	131.43 ^a	.40 ^a	.67 ^a , .11 ^b
ITR × CON	2.18	.01 ^c	-.07	1.31	.00	-.05
Sex, age	47.79 ^a	.10	.07, -.13 ^a	3.41 ^c	.02 ^c	.11, -.02
COM, CON	30.50 ^a	.06	.22 ^a , .11 ^a	40.01 ^a	.17 ^a	.44 ^a , .18 ^a
COM × CON	.48	.00	.02	.52	.00	-.04
Positive parenting						
Sex, age	47.79 ^a	.10 ^a	.20 ^a , -.13 ^a	3.41 ^c	.02 ^c	.30 ^b , -.03
DIS, POS	61.48 ^a	.11 ^a	.34 ^a , -.03	58.12 ^a	.23 ^a	.52 ^a , .00
DIS × POS	.04	.00	-.01	8.49 ^a	.02 ^a	-.14 ^a
Sex, age	47.79 ^a	.10 ^a	.05, -.10 ^a	3.41 ^c	.02 ^c	.09, -.01
INS, POS	249.64 ^a	.33 ^a	.58 ^a , -.02	265.96 ^a	.57 ^a	.79 ^a , -.06
INS × POS	.03	.00	-.00	7.48 ^b	.01 ^b	-.08 ^b
Sex, age	47.79 ^a	.10 ^a	.18 ^a , -.14 ^a	3.41 ^c	.02 ^c	.17, -.06 ^c
ITR, POS	146.99 ^a	.23 ^a	.48 ^a , -.01	127.14 ^a	.39 ^a	.69 ^a , .02
ITR × POS	1.63	.00	.04	4.08 ^c	.01 ^c	-.08 ^c
Sex, age	47.79 ^a	.10 ^a	.04, -.14 ^a	3.41 ^c	.02 ^c	.04, -.03
COM, POS	25.69 ^a	.05 ^a	.22 ^a , -.05	33.46 ^a	.14 ^a	.48 ^a , -.03
COM × POS	.08	.00	.01	4.70 ^c	.01 ^c	-.13 ^c

Note: DIS = Disagreeableness; INS = Emotional Instability; ITR = Introversion; COM = Compulsivity; CON = Negative control; POS = Positive parenting.

^a*p* < .003. ^b*p* < .01. ^c*p* < .05, according to the Bonferroni correction; all predictors are standardized.

Coefficient B refers to the unstandardized regression coefficient calculated by the Friedrich procedure (Aiken & West, 1991, p. 44) and represents the appropriate standardized solution for use with multiplicative terms.

All analyses were also conducted controlling for referral status and showed no differences in main effects and a slightly declined interactive effect for disagreeableness × child ratings of positive parenting.

Table 5
 Tests of Significance of Difference Between Simple Slopes (*T*-values)
 and Effect Sizes of Interaction

	Simple Slopes				<i>f</i> ²
	Parenting + <i>ISD</i>	Parenting <i>Mean</i>	Parenting - <i>ISD</i>	Interaction	
Externalizing problems					
P-Negative control × DIS	24.18 ^a	22.62 ^a	12.58 ^a	5.42 ^a	.03
P-Negative control × INS	11.45 ^a	11.45 ^a	5.26 ^a	4.03 ^a	.02
C-Negative control × DIS	21.91 ^a	23.61 ^a	14.08 ^a	3.95 ^a	.04
C-Negative control × INS	9.25 ^a	10.54 ^a	5.35 ^a	2.93 ^a	.02
Internalizing problems					
C-Positive parenting × DIS	5.67 ^a	10.81 ^a	9.87 ^a	-2.91 ^a	.02

Note: Effect size (f^2) = $(r^2_{Y.MI} - r^2_{Y.M}) / (1 - r^2_{Y.MI})$ (Aiken & West, 1991, p. 156), with $r^2_{Y.MI}$ = squared multiple correlation from combined predictors by two sets of variables, M (main effects) and I (interaction effect) and $r^2_{Y.M}$ = squared multiple correlation resulting from prediction by set M;

DIS = Disagreeableness, INS = Emotional Instability;

P- = parental behavior rated by the parent (mother);

C- = parental behavior rated by the child;

^a $p < .001$. ^b $p < .01$. ^c $p < .05$.

Negative Control has only minor effects, whereas Positive Parenting has no effect. In contrast, all of the four maladaptive personality characteristics were significant predictors of child-internalizing problems, with particularly strong effects for Emotional Instability and Introversion.

Interaction Effects

Beyond the main effects of maladaptive traits and parenting, Tables 3 and 4 present five moderator effects that were found significant for externalizing and internalizing problem behavior (the level of significance was adjusted with the Bonferroni correction to $p < .003$, in order to correct for the large number of tests).

Four moderator effects were predictive of child externalizing behavior, with a significant Disagreeableness × Negative Control and Emotional Instability × Negative Control interaction for both parental and child ratings of parental behavior. For internalizing

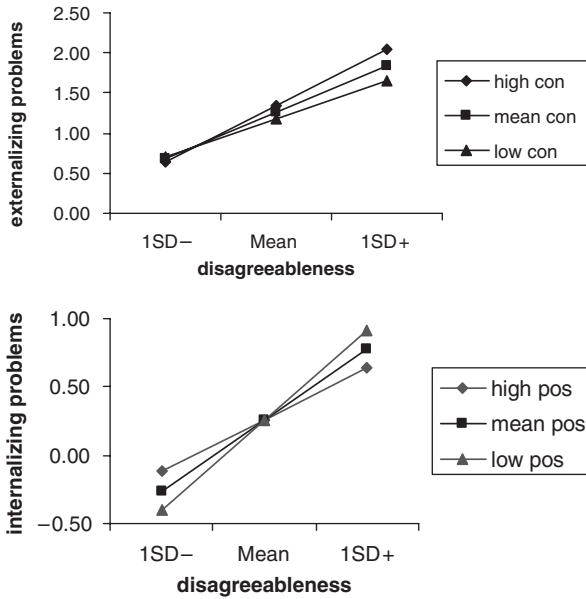


Figure 1

Panel A: Disagreeableness \times Negative control (parental ratings) interaction predicting child externalizing problem behavior (synergistic interaction). Panel B: Disagreeableness \times Positive parenting (child ratings) predicting child internalizing problem behavior (buffering interaction).

problem behavior, Table 4 shows one moderating effect for Disagreeableness \times Positive Parental Behavior for child ratings of parental behavior.

Testing and Interpreting Interaction Effects

The results of the simple slope tests for the significant interactions are reported in Table 5 and show for both parental and child ratings that a parenting environment of high restrictive control enhances the negative effect of the child’s Disagreeableness or Emotional Instability on externalizing behavior at each level of the maladaptive personality trait (see for an example Figure 1, panel A). On the other hand, a high amount of positive parental behavior weakens the effect of Disagreeableness on internalizing problems (child ratings of parenting) for low, mean, and high disagreeable children. Table 5 also reports the effect sizes for the interaction terms, ranging from .02 to

.04, which should be considered as small (Aiken & West, 1991, p. 158).

DISCUSSION

The present study describes the relationships between maladaptive traits and psychopathology in childhood, using a dimensional taxonomy of maladaptive traits specifically designed for children, and including an environmental measure to explore the moderating role of positive versus negative controlling parental behavior. This work can be framed within the search for valid dimensions of maladaptive personality that describe trait-like characteristics of psychopathology in childhood assumed to represent developmental manifestations of personality disorder pathology. From a conceptual viewpoint, the present study further examines whether childhood maladaptive personality traits and psychopathology can be considered as distinct constructs, relying on the measurement confounding analysis techniques outlined in Lengua et al. (1998) and Lemery et al. (2002).

Using hierarchical regression analysis, the main-effect model showed sizeable positive predictions of Disagreeableness, Emotional Instability, Introversion, and Compulsivity for both internalizing and externalizing problem behavior that are further in line with previous temperamental/personality studies examining links with child psychopathology (Caspi et al., 1995; Colder et al., 2002; Krueger et al., 1996; Leve et al., 2005; Prinzie et al., 2003; Prior et al., 2000; Van Leeuwen et al., 2004). These findings support the vulnerability model for describing trait-psychopathology associations at young age (Tackett, 2006), which states that maladaptive traits are risk factors for the development of internalizing and externalizing problem behavior and extends current evidence on trait-psychopathology associations toward the maladaptive personality perspective. Although this strong interrelation suggests a substantial maladaptive trait component in various forms of psychopathology, the measurement confounding analyses indicated only minor overlap at the item level of both constructs. While both the DIPSI and the CBCL measures account for descriptions of pathological functioning, the present results support the distinctiveness of maladaptive traits and psychopathology, explicitly underscoring the dimensional conceptualization of psychopathology as well as a spectrum hypothesis on the

trait-psychopathology relationship (Shiner & Caspi, 2003; Tackett, 2006).

From a parental perspective, the main effect analyses demonstrated significant positive predictions of negative controlling parental behavior for explaining externalizing psychopathology and only small negative or no effects of positive parental behavior on either forms of problem behavior. This latter effect was recently discussed by Bögels and Brechman-Toussaint (2006), who stated that the inconsistent association between “absence of warmth or acceptance” (conceptually similar to low positive parenting) and child internalizing psychopathology may be due to a wide range of measurement instruments used across different groups of children. Concerning externalizing problem behavior however, previous studies have provided convergent evidence for the relation between positive parenting and externalizing psychopathology (Belsky et al., 1998). In the present study, the lack of an association between positive parenting and child problem behavior could be sample specific or could possibly be explained by the fact that the current parenting questionnaire is constructed within a social-learning framework, emphasizing item content referring to parental behavior for controlling misbehavior of the child.

Beyond the main effects, we explored whether interactive processes between child maladaptive personality and parental behavior affect the presence of child psychopathology. For both parental and child ratings, Disagreeable and emotionally unstable children showed to be at risk for externalizing problem behavior, especially when growing up with highly controlling parents. These findings are in line with previous studies (reviewed by Putnam et al., 2002) on the interaction of harsh punishment, negative dominance, or power-assertive strategies (related to Negative Control) with a child’s fear, negativity, or anger (related to Emotional Instability and Disagreeableness) to account for various forms of externalizing behavior. The interactive effect of positive parental behavior with Disagreeableness in predicting child internalizing problem behavior, demonstrates a protective effect of high positive parenting in Disagreeable children for explaining internalizing psychopathology. This finding implies that low positive parenting in Disagreeable children increases the likelihood of internalizing problems, further specifying the previously mentioned general association between parental “absence of warmth or acceptance” and internalizing problems

(Bögels & Brechman-Toussaint, 2006) to the conditional effect model stating that the detrimental outcome of low positive parenting on internalizing psychopathology acts especially on children with vulnerable trait profiles.

The Applied Perspective

Focusing at the diagnostic or descriptive level, the present study provides evidence for the unique value of maladaptive trait and psychopathology measures since they assess distinct—although related—constructs. The strong main effects for maladaptive traits suggest the need for intervention programs that take into account the personality profile of the child instead of solely centering at the symptomatic level of pathology. Along with information on parenting behavior, the present results may encourage practitioners to consider differential effects to be expected from environmental (e.g. parental) interventions for children with diverse trait characteristics. Reflecting on the interactive effects between parental behavior and childhood maladaptive traits may contribute to a more realistic perspective on expected change, and may result in setting more feasible goals. This suggestion is in line with Tackett (2006), who recommends that interventions may focus on children with vulnerable personality profiles (i.e. children with higher scores on one or more maladaptive traits) but also on environmental risk factors (such as high negative controlling behavior) that interact with the child's personality and influence the onset or course of psychopathology.

Limitations and Conclusions

The present study has a number of limitations that one should take into account when interpreting the results. First, maladaptive traits and child psychopathology were both described by the mother, inducing common rater variance. Although we partly controlled for common rater variance by examining shared item overlap and by including child ratings of parenting for the sample of nonreferred and referred outpatient children, it is possible that part of the observed associations based upon parental ratings can be attributed to common rater variance. Secondly, our sample included both referred and nonreferred children as well as nonreferred adolescents. The availability of an additional referred adolescent sample would further enable us to examine moderating effects across ages and clin-

ical status. A third and major limitation of the present work is its cross-sectional design, making it impossible to draw causal inferences from the current trait-parenting and psychopathology associations.

In sum, these findings contribute to our understanding of child psychopathology correlates, introducing a maladaptive perspective on childhood traits, and directly corroborating previous studies relying on FFM measures of child personality (Prinz et al., 2003; Van Leeuwen et al., 2004). The results further demonstrate the validity of maladaptive trait dimensions at young age, given the important main effects of personality and the moderating effect of parenting on the maladaptive trait-psychopathology associations. From a hierarchical view on the structure of personality and psychopathology, the present study describes maladaptive trait-psychopathology associations at the broad level of the hierarchy. Eventually, our understanding of the psychopathology correlates will benefit from future studies that explore more specific associations between maladaptive trait facets and psychopathological syndromes (see also Tackett, 2006). The integration of trait-psychopathology associations described across time and at different hierarchical levels may further challenge the representation of trait-like aspects of psychopathology already apparent in childhood (Widiger & Clark, 2000), ultimately verifying (1) how broad and specific trait pathology aspects at young age can be considered as precursors of adult personality pathology and (2) whether or not early trait and psychopathology constructs can be represented within the same integrative hierarchical model of personality, psychopathology, and personality pathology as proposed for adults (Krueger, 2005). Furthermore, studies that also incorporate potential influences of environmental risk and protective factors such as parenting will contribute to an adequate and comprehensive description of the processes through which early maladaptive trait patterns develop into adult clinical disorders.

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