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Person-Related Protective and Vulnerability Factors of Psychopathology Symptoms in Non-Clinical Adolescents

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Abstract Psychopathology in youths is thought to originate from a dynamic interplay of a variety of protective and vulnerability factors. In this study, a large multi-ethnic sample of non-clinical adolescents ($N = 376$) completed questionnaires for measuring a wide range of person-related protective and vulnerability factors as well as psychopathology symptoms, in order to explore (a) the relations among various protective and vulnerability factors, and (b) the unique contributions of these protective and vulnerability factors to different types of psychological problems. Results indicated that the overlap among protective and vulnerability factors was quite modest. Further, it was found that factors clustered in theoretically meaningful components reflecting protection, vulnerability, and more specific aspects of coping and social support. Finally, data indicated that each type of psychopathology symptoms was associated with a typical set of protective and vulnerability factors. Although these results should be interpreted with caution because of the cross-sectional nature of the study, they may nevertheless guide future research exploring multifactorial models of psychopathology in youths.

Keywords Protection and vulnerability · Individual difference variables · Psychopathology symptoms · Adolescents

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Introduction

Epidemiological studies have shown that a substantial proportion of youths suffer from a psychological disorder. For example, Costello et al. (2003) employed a structured interview to assess psychiatric disorders in a large community sample of 1,420 children and adolescents. Results indicated that emotional problems such as anxiety disorders and depression, as well as disruptive behavior disorders such as oppositional-defiant disorder and conduct disorder were highly prevalent among youths (see also Ford et al. 2003). Besides these common childhood disorders, there are also a number of less frequent psychiatric problems that become clearly prominent during adolescence, namely eating disorders (Ackard et al. 2007), somatization disorders (Essau et al. 1999), and substance use disorders (Costello et al. 2003).

Current theories adopt the view that psychopathology in youths is caused by multiple factors (Mash and Wolfe 2002; Wenar and Kerig 2000). More specifically, it is assumed that a psychological disorder is rarely the result of one direct causal process, but rather is determined by a wide range of protective and vulnerability factors. Vulnerability factors increase the likelihood that young people will develop psychological problems, whereas protective variables reduce the chance of developing such difficulties. The basic idea is that young people are at risk for developing a psychological disorder when vulnerability factors clearly exceed protective variables. In the past decade, multifactorial models have been formulated in which the etiology of psychopathology among youths is conceptualized in terms of such an imbalance of protective and vulnerability factors (e.g., Goodyer 2001; Reid et al. 2002; Vasey and Dadds 2001). Protective and vulnerability factors can operate at various levels, namely within the

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individual, the family, or the school and community (Masten and Coatsworth 1998).

The present article is concerned with person-related, individual difference variables that are thought to protect against or promote the development of psychopathology symptoms in youths. A first class of variables is concerned with personality traits. There is general consensus in the literature that the personality structure of youths consists of five superordinate traits, namely (1) extraversion (which refers to aspects such as activity, enthusiasm, assertiveness, and self-confidence), (2) agreeableness (which reflects concern and sensitivity towards others and their needs), (3) conscientiousness (which has to do with dependability, orderliness, precision, and the fulfilling of commitments), (4) neuroticism (which pertains to a proneness to experience feelings of anxiety, depression, discontent, and anger), and (5) intellect/openness (which is concerned with intellectual functioning, creativity, imagination, and social and cultural interest). More relevant to the present context, there is evidence to indicate that these Big Five personality traits are in a theoretically meaningful way related to psychopathology symptoms in youths. For example, in a study examining the personality profiles of clinically referred adolescents, John et al. (1994) showed that low agreeableness, low conscientiousness, and high extraversion were associated with behavioral problems, whereas high neuroticism was linked to emotional problems, which suggests that some Big Five personality factors promote psychopathology while others decrease the risk of developing psychological problems (see Matthews et al. 2003).

A second class of person-related factors that may be relevant to the study of psychopathology in youths is concerned with the construct of self-regulation. Briefly, self-regulation encompasses "any efforts by the human self to alter any of its own inner states or responses" (Vohs and Baumeister 2004, p. 2), and thus pertains to the regulation of thoughts, emotions, impulses, appetite, attention, and behavior. One relevant variable that should be discussed in this context is effortful control, which can be defined as "the ability to inhibit a dominant response to perform a subdominant response" (Rothbart and Bates 2006), and generally is thought to consist of two main components: inhibitory control (i.e., the ability to inhibit one's behavior if necessary) and attention control (i.e., the ability to focus and shift attention when needed). Clearly, effortful control refers to executive functioning-based processes that enable children to regulate their behavior and emotions. As such, it is not surprising to note that various researchers have found that low levels of effortful control in youths are associated with high levels of emotional and behavioral symptoms (e.g., Eisenberg et al. 2001).

Whereas effortful control is concerned with the basic requirements of self-regulation, there are also individual difference variables that describe controlling and regulating processes at a more concrete level. Exemplary in this regard are coping styles, which pertain to relatively stable psychological strategies of dealing with stressful and threatening internal and external events (Folkman and Lazarus 1985). Research has indicated that youths tend to employ a wide variety of behavioral and cognitive coping strategies, some of which are considered to be more adaptive than others. Based on an extensive review of the literature, Compas et al. (2001) concluded that problem-focused and engagement coping (i.e., strategies that try to change the stressful situation itself and an orientation towards the source of stress and related emotions and thoughts) are associated with better psychological health in children and adolescents than emotion-focused and disengagement coping (i.e., strategies that try to soothe the negative emotions elicited by the situation and an orientation away from the stressor and associated emotions and thoughts).

Social support can be regarded a specific type of coping (Compas et al. 2001) that is generally viewed as a protective factor that is involved in the maintenance of youths' psychological functioning and well-being. Most psychologists will agree on the notion that "belonging to a network of communication and mutual obligation, being esteemed and valued by others, and being loved and cared by others" (Cobb 1976, p. 300) is important for all human beings. In the context of child psychopathology, social support has been primarily investigated as a moderator variable that buffers the negative impact of stress. Indeed, various studies have shown that (perceived) support from parents and peers protects youths against the development of emotional and behavioral problems after being confronted with adverse circumstances and negative life events (Grant et al. 2006).

Self-related concepts constitute a third and final class of individual difference variables, which are thought to play a role in protecting youths against the development of psychological disorders. The first concept is self-esteem, which refers to children's feelings of worthiness and value as a person (Harter 1985). Self-esteem is generally regarded as an important indicator of children's well-being and mental health. More specifically, higher levels of self-esteem are associated with lower levels of emotional and behavioral symptoms in youths (Bos et al. 2006), although there is also some evidence indicating that extreme conduct problems are linked to high levels of self-esteem (Baumeister et al. 1996). Another self-related concept is self-efficacy, which is concerned with the perceived ability to produce a desired action (Bandura 1997). So far, research has demonstrated that self-efficacy seems to be involved in emotional problems such as anxiety and depression (Bandura et al. 1999; Muris 2001, 2002), although it might also

be possible that youths' perceived abilities in academic, social, and emotion-regulation domains are relevant in the context of disruptive behavior problems. A final concept is self-control, also known as perceived control, which pertains to youths' subjective beliefs about their ability to exert control over outcomes in important life domains (Weisz and Stipek 1982). Previous studies have primarily addressed the role of self-control in relation to anxiety and depression in youths (Muris et al. 2003b; Weisz et al. 2001), but as control over one's behavior is an important element of self-control this concept seems also important for behavioral problems in youths.

To recap, most types of psychopathology in youths are associated with a broad range of protective and vulnerability factors, including person-related variables such as personality traits, self-regulation capacity and coping skills, and various self-related concepts. Previous studies in this domain have typically focused on the investigation of only one or a few of these factors. Although such research has certainly yielded insight in the variables that are thought to be involved in development of psychopathology in youths, we currently know relatively little about (1) the relations among various protective and vulnerability factors, and (2) the unique contributions of these protective and vulnerability factors to different types of psychological problems. With these issues in mind, the present study was conducted. A large multi-ethnic sample of non-clinical adolescents completed an extensive survey which included questionnaires for measuring a variety of person-related protective and vulnerability factors as well as psychopathology symptoms. For the assessment of symptoms, we not only relied on the widely used Youth Self-Report (YSR; Achenbach 1991) but also on the recently developed shortened version of the Psychopathology Questionnaire for Youths (PQY; Hartman et al. 2001). This provided an opportunity to correlate scores on the YSR and the PQY and thus to investigate the concurrent validity of the latter scale.

Method

Participants and Procedure

Three-hundred-and-seventy-six adolescents (152 boys and 224 girls) of two secondary schools in Rotterdam and Delft, the Netherlands, were recruited for the purpose of the present study. Children had a mean age of 15.86 years (SD = 1.36; range 13–19 years), and followed either higher general secondary education (46.3%) or pre-university education (53.7%). No exact information on the socio-economic background of the youths was available, but it can be mentioned that 59.6% of them were from original Dutch descent. The other 40.4% had an ethnic minority background (e.g., Surinam, Antillean, Cape Verdean, Turkish, and Moroccan), which in the Netherlands often is indicative for a lower socio-economic status.

Parents and adolescents first received information about the study and after both had given their informed consent, adolescents completed the set of questionnaires (see below) anonymously during regular classes. More than half of the adolescents (58.6%) agreed to participate. A teacher and a research assistant were always present during the administration of the questionnaires to ensure independent and confidential responding and to provide clarification when necessary. As the survey was quite lengthy, two versions were employed in which the order of the questionnaires was reversed. All adolescents received a candy bar in return for their participation in the study.

Questionnaires

Protective and Vulnerability Factors

The *Big Five Questionnaire for Children* (BFQ-C; Barbaranelli et al. 2003) is a 65-item scale for measuring the five basic factors of personality (i.e., the Big Five) in children and adolescents: (1) extraversion (e.g., "I like to meet other people"), (2) agreeableness (e.g., "I share my things with other people"), (3) conscientiousness (e.g., "I do things with great care and attention"), (4) neuroticism (e.g., "I easily loose my calm"), and (5) intellect/openness (e.g., "I like to know and to learn new things"). Items have to be scored on a 5-point Likert scale ranging from 1 = *almost never* to 5 = *almost always*. Individual item scores are combined to yield a total score for each of the five factors. Clear support has been found for the psychometric qualities of the BFQ-C in children and adolescents from various countries (Barbaranelli et al. 2003, 2008; Del Barrio et al. 2006; Muris et al. 2005).

The child version of the *Cognitive Emotion Regulation Questionnaire* (CERQ; Garnefski et al. 2007) is a 36-item self-report scale for measuring nine conscious cognitive emotion regulation strategies that young people may use in response to negative life events: self-blame (putting the blame of what happened on yourself; e.g., "I think that I have been stupid"), acceptance (accepting and resigning oneself to what has happened; e.g., "It just happened; there is nothing I can do about it"), rumination (thinking about the feelings and thoughts associated with the negative event; e.g., "Again and again, I think of how I feel about it"), positive refocusing (thinking about joyful and pleasant issues instead of thinking about the actual event; e.g., "I think of nicer things"), planning (thinking about what steps to take and how to handle the negative event; e.g., "I think of how I can change it"), positive reappraisal

(attaching a positive meaning to the event in terms of personal growth; e.g., "I think I can learn from it"), putting into perspective (playing down the seriousness of the event and emphasizing its relativity; e.g., "I think that worse things can happen"), catastrophizing (explicitly emphasizing the terror of what has happened; e.g., "I often think how horrible the situation was"), and other-blame (putting the blame of what has happened on others; e.g., "I think that it's the fault of others"). Items are rated on a 5-point Likert scale with 1 = *(almost) never* and 5 = *(almost) always*. Research has indicated that the CERQ is a reliable and valid instrument for assessing cognitive emotion regulation strategies (e.g., Garnefski et al. 2001), and there is evidence showing that this is also true in samples of children and adolescents (Garnefski et al. 2003a, 2005, 2007).

The *Effortful Control Scale* (ECS; Muris 2006) consists of 15 items that were selected from the Attention Control Scale (ACS; Derryberry and Reed 2002) and the Early Adolescent Temperament Questionnaire (EATQ; Ellis and Rothbart 2001). Items represent various aspects of effortful control, namely attention focusing (e.g., "It is easy for me to really concentrate on homework problems"), attention shifting (e.g., "I can easily do two things at the same time"), and inhibitory control (e.g., "When someone tells me to stop doing something, it is easy for me to stop"). Respondents are asked to score each item on a 4-point scale with 1 = *not true*, 2 = *somewhat true*, 3 = *true*, and 4 = *very true*. Scores are summed to yield a total effortful control score, which has been shown to possess satisfactory internal consistency (Muris 2006). In addition, evidence has been obtained for the reliability and validity of the scales from which the ECS is derived (Ellis and Rothbart 2001; Muris et al. 2004, 2007; Muris and Meesters 2009).

The *Multidimensional Scale of Perceived Social Support* (MSPSS; Zimet et al. 1988) is a 12-item questionnaire for measuring perceptions of social support adequacy from family, friends, and a significant other. Respondents answer statements such as "My family really tries to help me", "I can count on my friends when things go wrong", and "There is a special person who is around when I am in need" on a 4-point Likert scale with 1 = *not at all true* and 4 = *very true*. In the present study, ratings on all items were summed to yield a total score, with higher scores reflecting a higher level of perceived social support. Research in adolescent samples has provided support for the reliability and validity of the MSPSS (Bruwer et al. 2008; Canty-Mitchell and Zimet 2000; Zimet et al. 1990).

The *Perceived Control Scale for Children* (PCS-C; Weisz et al. 1998) is a 24-item questionnaire for measuring children's beliefs about their ability to exert control over outcomes in academic, social, and behavioral domains. Half of the items are worded in a procontrol direction (e.g., "I can be popular with kids of my age, if I really try"), whereas the other half is formulated in a negative direction (e.g., "Even if I try, I can *not* be popular with kids of my age"). Each item has to be scored on a 4-point scale with 1 = *not true*, 2 = *somewhat true*, 3 = *quite true*, 4 = *very true*. A total score can be obtained by summing the scores across all items (after recoding the negatively directed items) with higher scores reflecting higher levels of self-control. Various studies have demonstrated that the PCS-C is a reliable scale that is related in a theoretically meaningful way with other control-related constructs such as perceived competence and perceived contingency (Muris et al. 2003b; Weisz et al. 2001).

The *Self-Efficacy Questionnaire for Children* (SEQ-C; Muris 2001) contains 24 items that can be allocated to three domains of self-efficacy: (1) social self-efficacy (e.g., "How well can you become friends with other children?") which has to do with the perceived capability for peer relationships and assertiveness; (2) academic self-efficacy (e.g., "How well can you study a chapter for a test?") which is concerned with the perceived capability to manage one's own learning behaviour, to master academic subjects, and to fulfil academic expectations; and (3) emotional self-efficacy (e.g., "How well can you control your feelings?") which pertains to the perceived capability of coping with negative emotions. Each item has to be scored on a 5-point scale with 1 = *not at all* and 5 = *very well*, and a total self-efficacy score can be computed by summing across all items. Research has yielded support for the validity of the SEQ-C scores: that is, scores on this scale correlated in the predicted way with scores on questionnaires measuring attributional and coping styles (Muris et al. 2001).

The *Self-Perception Profile for Children* (SPPC; Harter 1985) consists of 36 items evaluating children's self-esteem in five domains: scholastic competence, social acceptance, athletic competence, physical appearance, and behavioral conduct, as well as global self-worth. Each SPPC item consists of two opposite descriptions, e.g., "Some children often forget what they have learned" but "Other children are able to remember all things easily". Children have to choose the description that fits best and then indicate whether the description is *somewhat true* or *very true* for them. Accordingly, each item is scored on a 4-point scale with a higher score reflecting a more positive view of oneself. In the present study, a total self-esteem score was computed by summing across all items. There is abundant evidence to support the psychometric properties of the SPPC. That is, the internal consistency and test–retest stability of the SPPC has been found to be satisfactory (e.g., Granleese and Joseph 1994; Muris et al. 2003a). Further, SPPC scores correlate positively with peer-, teacher-, and parent-ratings of children's competence, which obviously supports the validity of the scale (Cole et al. 2001; Van den Bergh and Marcoen 1999).

The *Adolescent version of the Utrecht Coping List* (UCL-A; Bijstra et al. 1994) is a 44-item questionnaire for measuring seven types of coping styles: active coping (e.g., "When I have a problem, I deal with it right away"), distraction (e.g., "When I have a problem, I try to distract myself"), avoidant coping (e.g., "I try to avoid the problem"), social support seeking (e.g., "When I have a problem, I ask someone to help me"), passive coping (e.g., "When I have a problem, I show people that I don't feel well"), and comforting thoughts (e.g., "When I have a problem, I think that everything will turn out all right"). Each item has to be rated on a 3-point scale with 1 = *almost never*, 2 = *sometimes*, and 3 = *often*. A total score for each coping style can be calculated by summing across relevant items. A handful of studies has employed the UCL-A to investigate the adjustment to stressful life events in young people, and this research has generally indicated that this scale provides meaningful information on youths' coping styles (Meijer et al. 2002; Van Middendorp et al. 2001).

Psychopathology Symptoms

The *Youth Self-Report* (YSR; Achenbach 1991) is widely used to assess behavioral and emotional problems in children and adolescents. The YSR consists of 112 items (e.g., "I am mean", "I am nervous") that have to be answered on a 3-point scale with 0 = *not true*, 1 = *somewhat or sometimes true*, and 2 = *very true or often true*. Originally item scores were combined into empirically derived factors (i.e., narrow-band scales) such as anxious-depressed, thought problems, aggressive behavior. In order to enhance comparability with current classification systems, Achenbach et al. (2003) constructed new scales that reflect a number of frequent diagnostic categories as listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association 1994), namely affective problems, anxiety problems, somatic problems, attention-deficit/hyperactivity problems, oppositional defiant problems, and conduct problems. Research has shown that the YSR is a reliable and valid instrument for measuring psychopathology problems in youths (Achenbach 1991; Verhulst et al. 1997), and similar favorable psychometrics have been obtained for the YSR DSM-oriented scales (Achenbach et al. 2003; Lengua et al. 2001).

The *Psychopathology Questionnaire for Youths* (PQY; Hartman et al. 2001) measures a broad range of psychopathology symptoms that according to the DSM may occur in children and adolescents. The shortened 39-item version that was used in the current study measures symptoms of depression (e.g., "I feel sad all the time"), anxiety (e.g., "I am scared to get a serious disease"), disruptive behavior (e.g., "I get angry if I don't get what I want"), eating problems (e.g., "I try to lose weight although other people tell me that my weight is normal"), and substance use (e.g., "I drink so much alcohol that I get drunk and have a hangover the next day"). Youths are asked to indicate to what extent each item is applicable to them: 1 = *not true*, 2 = *somewhat true*, 3 = *true*, and 4 = *very true*. A total score and subscale scores can be obtained by summing across relevant symptoms. To test the validity of the shortened PQY, three clinical child psychologists were asked to link its items to DSM disorders. Results indicated that all items pointed unambiguously in the direction of the intended syndromes. Further support for the reliability and construct validity of the PQY has been obtained in previous research by Hartman et al. (2001) and Muris et al. (2003c).

Results

General Findings

Before discussing the main results of the current study, a number of general findings should be addressed. First, questionnaires generally displayed satisfactory internal consistency. For most scales Cronbach's α were .70 or higher, which indicates sufficient to good reliability (Table 1). For a number of scales, reliability coefficients were lower and this was particularly true for UCL-A avoidant coping ($\alpha = .52$), UCL-A expression of emotions ($\alpha = .41$), and YSR OD problems ($\alpha = .56$), for which alpha values were below acceptable limits. Second, significant gender differences were found for a number of protective and vulnerability factors, namely BFQ-C agreeableness [$t(374) = 4.18$, $P < .001$], CERQ rumination [$t(374) = 5.04$, $P < .001$], MSPSS social support [$t(374) = 5.80$, $P < .001$], SEQ-C self-efficacy [$t(374) = 3.54$, $P < .001$], SPPC self-esteem [$t(374) = 4.81$, $P < .001$], UCL-A social support seeking [$t(374) = 5.62$, $P < .001$] and passive coping [$t(374) = 8.92$, $P < .001$]. As can be seen in Table 1, girls displayed higher levels of agreeableness, rumination, social support (seeking), and passive coping, whereas boys scored higher on self-efficacy and self-esteem. There were also significant gender differences with regard to psychopathology symptoms. In general, girls displayed higher levels of emotional symptoms such as anxiety (YSR and PQY), depression (YSR and PQY), somatic problems (YSR), and eating problems (PQY) than did boys [all $t(374)$'s ≥ 3.39, P's $< .001$]. Third, age was not substantially related to scores on scales of protective and vulnerability factors and psychopathology symptoms. When applying a Bonferroni correction, only the correlation with substance use attained statistical significance ($r = .18$, $P = .001$): with increasing age, youths were more inclined to use alcohol and drugs. Fourth and finally, there was some impact of ethnicity on youths' symptom levels. More

precisely, adolescents with an ethnic minority background displayed significantly higher levels of depression (YSR) and behavior problems (YSR and PQY) than adolescents from original Dutch descent [all $t(374)$'s ≥ 2.94, P's $< .005$].

Relations Among Protective and Vulnerability Factors

Relations among various protective and vulnerability factors were examined in two ways. First, a correlation analysis was performed. Because the number of computed correlations was quite large, we will only discuss correlations that were >|.40| and attained a significance level of $P < .001$. Table 2 shows the 26 out of 325 correlations (i.e., 7.7%), which met this criterion. As can be seen, there were substantial positive correlations among what could be labeled as the more positive Big Five personality traits (i.e., extraversion, agreeableness, conscientiousness, and intellect/openness; r's between .43 and .47), and between these personality traits and self-related concepts such as self-efficacy and self-esteem (r's between .40 and .54). BFQ-C neuroticism was especially related to UCL passive coping ($r = .42$) and CERQ catastrophizing ($r = .45$), whereas a negative relationship was found with effortful control ($r = -.40$). Further, self-related concepts were positively correlated with each other: in particular self-efficacy was clearly positively linked to self-esteem ($r = .60$) and self-control ($r = .44$). Finally, there were also positive associations among various coping styles and emotion regulation strategies, with the most substantial correlations being those between CERQ planning and CERQ positive reappraisal ($r = .58$), CERQ putting into perspective and UCL-A comforting thoughts ($r = .53$), and CERQ positive reappraisal and CERQ putting into perspective ($r = .51$).

Second, a principal components analysis (with a varimax rotation) was performed on various (sub)scales for measuring protective and vulnerability factors. This analysis yielded eight factors with eigenvalues ≥ 1 (i.e., 5.35, 3.34, 2.15, 1.73, 1.61, 1.26, 1.08, and 1.00), which accounted for 67.4% of the total variance. Inspection of the scree plot and various solutions revealed that a five-factor structure was most satisfactory. As shown in Table 3, the first factor consisted of positive self-related concepts, positive personality traits, and a number of adaptive, coping and emotion regulation strategies, and thus can be labeled as 'person-related protection'. The second factor contained neuroticism and a number of clearly maladaptive coping and emotion regulation strategies, and can be named as 'person-related vulnerability'. Note in passing that effortful control and self-control loaded negatively on this factor. The third factor mainly consisted of CERQ scales that pertain to a confrontation with and acceptance of the problem, and therefore can be termed 'problem-focused cognition'. The fourth factor was predominantly focused on avoidant coping strategies that aimed to soothe negative emotions, and as such can be defined as 'emotion-focused disengagement'. The fifth and final factor consisted of social support seeking, perceived social support, and the personality trait of agreeableness, and hence can be labeled as 'social connectedness'.

Protective/Vulnerability Factors and Psychopathology Symptoms

To examine unique relations between protective and vulnerability factors, on the one hand, and various types of psychopathology symptoms, on the other hand, a series of stepwise regression analyses was carried out. To control for the influence of demographic variables, gender, age, and ethnicity[1] were entered into the equation on step 0. Given the large number of predictors, a probability level of .001 was adopted for a new variable to be taken up in the equation.

The results of the regression analyses predicting symptoms as measured by the YSR are displayed in Table 4. In general, predictors accounted for between 12% (somatic symptoms) and 49% (affective problems) of the variance. Further, it was found that BFQ-C neuroticism and SEQ-C self-efficacy were consistent predictors of emotional symptoms. More precisely, high levels of neuroticism combined with low levels of self-efficacy were associated with higher levels of affective, anxiety, and somatic symptoms. Significant contributions were also made by self-blame (positive) and extraversion (negative) in the case of YSR affective problems, and by conscientiousness and passive coping (both positive) in the case of YSR anxiety problems.

The Big Five personality traits of neuroticism, extraversion (both positive), and conscientiousness (negative) appeared to be significant predictors of behavioral problems as indexed by the YSR. In addition, effortful control (negative) made a significant contribution of ADH symptoms, whereas agreeableness and self-control (both negative) entered into the equation predicting conduct problems.

The regression analyses predicting psychopathology symptoms as indexed by the PQY indicated that various protective and vulnerability factors accounted for between 3 (substance use) and 48% (depression) of the total variance (Table 5). Emotional symptoms such as depression and anxiety were again explained by BFQ-C neuroticism and SEQ-C self-efficacy. Note further that social support (negative), rumination and conscientiousness (both positive) also

[1] Highly similar results were obtained when conducting the regression analyses for Dutch and non-Dutch youths.

Table 1 Descriptive statistics (means, standard deviations, gender differences, and reliability coefficients) of various questionnaires

	Total group ($N = 376$) M (SD)	Boys ($n = 152$) M (SD)	Girls ($n = 224$) M (SD)	Reliability Cronbach's α
Protective and vulnerability factors				
BFQ-C				
Extraversion	35.00 (5.57)	35.30 (4.91)[a]	34.79 (5.97)[a]	.80
Agreeableness	35.80 (4.82)	34.57 (4.60)[a]	36.63 (4.79)[b]	.80
Conscientiousness	31.10 (5.55)	30.33 (5.50)[a]	31.62 (5.54)[a]	.81
Neuroticism	21.93 (5.47)	20.80 (5.12)[a]	22.70 (5.57)[a]	.81
Intellect/openness	32.22 (5.42)	33.08 (5.06)[a]	31.64 (5.58)[a]	.73
CERQ				
Self-blame	9.82 (2.98)	9.47 (2.83)[a]	10.06 (3.06)[a]	.69
Acceptance	12.01 (3.40)	11.72 (3.56)[a]	12.21 (3.27)[a]	.73
Rumination	11.08 (3.39)	10.05 (3.20)[a]	11.79 (3.34)[b]	.74
Positive refocusing	11.52 (3.50)	10.96 (3.43)[a]	11.90 (3.50)[a]	.79
Planning	13.05 (3.17)	12.91 (3.23)[a]	13.14 (3.13)[a]	.76
Positive reappraisal	12.51 (3.34)	12.51 (3.17)[a]	12.51 (3.46)[a]	.71
Putting into perspective	11.61 (3.69)	11.12 (3.49)[a]	11.95 (3.80)[a]	.78
Catastrophizing	7.49 (3.19)	6.99 (2.86)[a]	7.83 (3.35)[a]	.73
Other-blame	7.31 (2.89)	7.68 (2.71)[a]	7.06 (2.98)[a]	.79
ECS				
Effortful control	43.07 (5.41)	44.07 (5.49)[a]	42.40 (5.25)[a]	.69
MSPSS				
Social support	35.97 (7.24)	33.45 (6.36)[a]	37.68 (7.31)[b]	.89
PCS-C				
Self-control	81.90 (8.42)	82.22 (8.99)[a]	81.68 (8.02)[a]	.87
SEQ-C				
Self-efficacy	79.82 (12.63)	82.58 (11.83)[a]	77.95 (12.83)[b]	.88
SPPC				
Self-esteem	96.22 (15.49)	100.75 (15.01)[a]	93.15 (15.07)[b]	.93
UCL-A				
Active coping	15.39 (2.79)	15.39 (2.89)[a]	15.39 (2.72)[a]	.73
Distraction	20.81 (3.79)	20.24 (3.95)[a]	21.20 (3.64)[a]	.74
Avoidant coping	15.43 (2.55)	15.41 (2.69)[a]	15.43 (2.45)[a]	.52
Social support seeking	12.39 (3.01)	11.37 (2.58)[a]	13.08 (3.08)[b]	.81
Passive coping	11.33 (2.65)	9.98 (2.46)[a]	12.24 (2.38)[b]	.70
Expression of emotions	6.00 (1.37)	5.86 (1.35)[a]	6.09 (1.38)[a]	.41
Comforting thoughts	10.48 (2.19)	10.14 (2.06)[a]	10.71 (2.25)[a]	.64
Psychopathology symptoms				
YSR				
Affective problems	4.70 (4.21)	3.55 (3.93)[a]	5.48 (4.22)[b]	.80
Anxiety problems	2.61 (2.24)	1.72 (1.86)[a]	3.22 (2.29)[b]	.69
Somatic problems	2.16 (2.26)	1.35 (1.99)[a]	2.71 (2.27)[b]	.70
ADH problems	5.13 (2.81)	4.86 (2.82)[a]	5.31 (2.80)[a]	.72
OD problems	2.27 (1.72)	2.26 (1.89)[a]	2.29 (1.59)[a]	.56
Conduct problems	3.83 (3.28)	4.34 (3.47)[a]	3.49 (3.10)[a]	.76
PQY				
Depression	14.25 (5.10)	13.18 (4.59)[a]	14.98 (5.31)[b]	.88
Anxiety	16.31 (4.97)	14.24 (4.26)[a]	17.72 (4.93)[b]	.80
Disruptive behavior	13.60 (3.40)	13.61 (3.68)[a]	13.59 (3.20)[a]	.74

Table 1 continued

	Total group ($N = 376$) M (SD)	Boys ($n = 152$) M (SD)	Girls ($n = 224$) M (SD)	Reliability Cronbach's α
Eating problems	3.92 (1.51)	3.47 (1.14)[a]	4.23 (1.65)[b]	.69
Substance use	6.70 (1.83)	6.89 (1.93)[a]	6.57 (1.75)[a]	.78

Note: BFQ-C = Big Five Questionnaire for Children, CERQ = Cognitive Emotion Regulation Questionnaire, ECS = Effortful Control Scale, MSPSS = Multidimensional Scale of Perceived Social Support, PCS-C = Perceived Control Scale for Children, SEQ-C = Self-Efficacy Questionnaire for Children, UCL-A = Utrecht Coping List for Adolescents, YSR = Youth Self-Report, ADH = Attention-Deficit/Hyperactivity, OD = Oppositional Defiant. Means with different superscripts indicate a significant gender difference at $P < .001$

made significant contributions to symptoms of depression, whereas passive coping and conscientiousness (both positive) accounted for proportions of the variance in anxiety symptoms.

Disruptive behavior problems were explained by the Big Five personality traits of neuroticism (positive), conscientiousness, and agreeableness (both negative), as well as SPPC self-esteem (positive). Symptoms of eating problems and substance use were predicted by respectively SEQ-C self-efficacy and BFQ-C conscientiousness (both negative).

Concurrent Validity of the PQY

Correlations between PQY and YSR scales showed the expected pattern. That is, PQY depression was most clearly related to YSR affective problems ($r = .79$, $P < .001$), PQY anxiety was most convincingly associated with YSR anxiety problems ($r = .64$, $P < .001$), whereas PQY disruptive behavior was substantially linked to YSR OD and conduct problems (r's being .52 and .67, P's $< .001$). Other correlations were smaller: that is, PQY eating problems correlated .26 and .21 (P's $< .001$) with respectively YSR affective problems and somatic problems, while PQY substance use correlated .41 ($P < .001$) with YSR conduct problems. The total score of the PQY correlated .74 ($P < .001$) with the total score of the YSR.

Discussion

The present study examined associations among a wide range of person-related protective and vulnerability factors, and the unique contributions that these protective and vulnerability factors make to psychological problems in non-clinical youths from a mixed ethnic background. The main results of this study can be catalogued as follows. First, the overlap among various protective and vulnerability factors was quite modest. That is, only a small percentage of the large number of correlations among various factors was substantial (i.e., >|.40|), which indicates that most variables represented a rather unique aspect of person-related protection and vulnerability. In spite of the fairly small conceptual overlap, a principal component analysis indicated that various factors clustered in theoretically meaningful components reflecting protection, vulnerability, and more specific aspects of coping and social support. Second, regression analyses indicated that each type of psychopathology symptoms was associated with a typical set of protective and vulnerability factors.

The few robust correlations that were found among various protective and vulnerability factors generally showed the expected pattern. For example, there were significant links among the Big Five personality traits of extraversion, agreeableness, conscientiousness, and intellect/openness (see also Barbaranelli et al. 2003), and between these traits and the self-related concepts of self-esteem and self-efficacy (e.g., Muris et al. 2003a). Further, neuroticism was positively associated with the more maladaptive strategies of passive coping and catastrophizing, which is in line with findings from the adult literature (e.g., Garnefski et al. 2003b; Hu et al. 2002). Finally, positive correlations emerged between a number of strongly allied coping and cognitive emotion regulation strategies (e.g., planning and positive reappraisal, putting into perspective and comforting thoughts, positive reappraisal and putting into perspective; e.g., Garnefski et al. 2001).

This correlational pattern was also reflected in the results of the principal components analysis, which made a clear distinction between person-based vulnerability (consisting of neuroticism and a number of dysfunctional coping/emotion regulation strategies) and protection (consisting of positive personality traits, self-related concepts, and functional coping strategies). In addition, two coping-related components emerged, namely 'problem-focused cognition', which had to do with facing and accepting the problem, and 'emotion-focused disengagement', which was concerned with strategies that are oriented away from one's negative emotions and thoughts. Note that there is support in the literature for a distinction between these coping clusters (see Compas et al. 2001). The final component of 'social connectedness', which was a mixture of social support seeking, perceived social support, and agreeableness, is in keeping with the idea that positive interpersonal relationships should be viewed as an important separate protective factor that is

Table 2 Most substantial (i.e., r's $\geq$ .40) correlations among questionnaires that were used for measuring various protective and vulnerability factors

	r
BFQ-C extraversion	
BFQ-C agreeableness	.43
SEQ-C self-efficacy	.54
SPPC self-esteem	.50
BFQ-C agreeableness	
BFQ-C conscientiousness	.47
BFQ-C intellect/openness	.43
SEQ-C self-efficacy	.48
BFQ-C conscientiousness	
SEQ-C self-efficacy	.46
SPPC self-esteem	.42
BFQ-C neuroticism	
CERQ catastrophizing	.45
ECS effortful control	−.40
UCL-A passive coping	.42
BFQ-C intellect/openness	
SEQ-C self-efficacy	.40
SPPC self-esteem	.42
CERQ acceptance	
CERQ putting into perspective	.46
CERQ positive refocusing	
UCL-A distraction	.44
CERQ planning	
CERQ positive reappraisal	.58
UCL-A active coping	.48
CERQ positive reappraisal	
CERQ putting into perspective	.51
SEQ-C self-efficacy	.41
CERQ putting into perspective	
UCL-A comforting thoughts	.53
CERQ catastrophizing	
CERQ other-blame	.45
ECS effortful control	
SEQ-C self-efficacy	.41
MSPSS social support	
UCL-A social support seeking	.40
PCS-C perceived control	
SEQ-C self-efficacy	.44
SEQ-C self-efficacy	
SPPC self-esteem	.60
UCL-A distraction	
UCL-A comforting thoughts	.48

Note: $N = 376$. BFQ-C = Big Five Questionnaire for Children, CERQ = Cognitive Emotion Regulation Questionnaire, ECS = Effortful Control Scale, MSPSS = Multidimensional Scale of Perceived Social Support, PCS-C = Perceived Control Scale for Children, SEQ-C = Self-Efficacy Questionnaire for Children, UCL-A = Utrecht coping list for adolescents. All correlations were significant at $P < .001$

thought to be particularly relevant when youths are confronted with adverse circumstances and negative life events (Grant et al. 2006).

With regard to the link between protective and vulnerability factors on the one hand, and psychopathology symptoms on the other hand, a number of remarks can be made. First of all, the personality trait of neuroticism was found to be a consistent predictor of various types of emotional as well as behavioral symptoms (except for eating problems and substance use). Obviously, this is line with a large body of research showing that neuroticism is associated with higher symptom levels of anxiety, depression, and disruptive behavior in youths (see for reviews Muris and Ollendick 2005; Nigg 2006), and also supports the general assumption that this basic personality trait should be considered as a significant marker of vulnerability to psychopathology (Ormel et al. 2004).

Second, conscientiousness was another Big Five personality trait that was frequently found to make a significant contribution to symptoms. Interestingly, the influence of this factor was different for various types of symptoms. That is, conscientiousness made a positive contribution in the case of emotional symptoms, but was found to have a negative effect in case of behavioral problems. This finding makes sense as high conscientiousness is associated with caution and prudence which are clear signs of anxiety and other affective symptoms (Muris et al. 2009), whereas low conscientiousness is related to impulsivity which is characteristic of disruptive behavior problems (Ehrler et al. 1999).

Third, self-efficacy emerged as a stable predictor of emotional symptoms (including somatic symptoms and eating problems), which underlines Bandura's (1997) idea that this self-related concept plays a crucial role in the self-regulation of affective states. In particular, it has been hypothesized that youths' ability to control negative emotions may be particularly helpful for dealing with anxious, depressive, or otherwise disturbing thoughts, which in turn would shield children against the development of emotional problems (Muris 2002).

Fourth, a number of protective and vulnerability factors appeared to make a rather specific contribution to certain types of psychopathological symptoms, which have been previously documented in the literature. For example, depression was associated with self-blame (Garnefski et al. 2001), rumination (Nolen-Hoeksema 1998), and lack of social support (Barrera and Garrison-Jones 1992), disruptive behavior was connected to higher levels of self-esteem (Baumeister et al. 1996), whereas substance use was related to low conscientiousness (e.g., Gunnarsson et al. 2008).

Fifth, for a number of hypothesized protective and vulnerability factors, the unique contribution to psychopathology

Table 3 Results of the principal components analysis (with varimax rotation) performed on (sub)scale scores of questionnaires for measuring various protective and vulnerability factors

	I Person-related protection	II Person-related vulnerability	III Problem-focused cognition	IV Emotion-focused disengagement	V Social connectedness
SPCC self-esteem	.76				
SEQ-C self-efficacy	.75	−.44			
BFQ-C intellect/openness	.71				
BFQ-C extraversion	.69				
BFQ-C conscientiousness	.54				
CERQ planning	.50		.46		
UCL-A active coping	.44				
CERQ catastrophizing		.77			
BFQ-C neuroticism		.74			
CERQ other-blame		.66			
UCL-A passive coping		.60			
ECS effortful control		−.57			
CERQ rumination		.54	.49		
PCS-C self-control		−.36			
CERQ acceptance			.72		
CERQ putting into perspective			.66	.36	
CERQ self-blame			.64		
CERQ positive reappraisal	.47		.51		
UCL-A distraction				.80	
UCL-A comforting thoughts			.37	.63	
UCL-A avoidance				.55	
CERQ positive refocusing				.54	
UCL-A expression of emotions				.48	
UCL-A social support					.76
MSPSS social support					.73
BFQ-C agreeableness	.49				.51
Eigenvalue	5.35	3.34	2.15	1.73	1.61
Percentage of variance	20.58	12.86	8.28	6.64	6.18

Note: $N = 376$. BFQ-C = Big Five Questionnaire for Children, CERQ = Cognitive Emotion Regulation Questionnaire, ECS = Effortful Control Scale, MSPSS = Multidimensional Scale of Perceived Social Support, PCS-C = Perceived Control Scale for Children, SEQ-C = Self-Efficacy Questionnaire for Children, UCL-A = Utrecht Coping List for Adolescents. Only factor loadings of >.35 are shown

symptoms was found to be quite limited. One example was self-esteem, which was found to be positively linked to disruptive behavior, but did not emerge as a protective variable in the regression equations. This result can be explained by the fact that self-esteem had to compete with the closely allied construct of self-efficacy, which eventually turned out to be a somewhat stronger predictor of symptoms. Another example concerned a wide range of coping and emotion regulation strategies, which did not emerge as independent predictors of psychopathology symptoms. It is possible that some of these strategies had so much overlap with other predictor variables (e.g., neuroticism, which was substantially linked to passive coping and catastrophizing) that they did not account for a unique proportion of the variance. Otherwise, it can be argued that the contribution of coping and emotion regulation strategies only becomes clearly manifest when studying youths who are confronted with a stressful situation (Grant et al. 2006).

Sixth, the percentages of explained variance accounted for by various protective and vulnerability factors were quite substantial for anxiety, depression, and disruptive behavior (i.e., ≥29%), certainly when acknowledging that only person-related variables were examined. In the case of somatic problems (YSR), eating problems, and substance use (PQY), explained variance was considerable smaller (i.e., ≤12%). This has probably to do with the fact that these problems were relatively infrequent in this sample of non-clinical adolescents, but it might also be the case that

Table 4 Results of the stepwise regression analyses in which psychopathology symptoms as indexed by the YSR were predicted from protective and vulnerability factors

	B	SE	*β*	R^2
YSR affective problems				.49*
BFQ-C neuroticism	0.47	0.03	.60	
SEQ-C self-efficacy	−0.12	0.01	−.35	
CERQ self-blame	0.25	0.05	.18	
BFQ-C extraversion	−0.12	0.03	−.16	
YSR anxiety problems				.36*
BFQ-C neuroticism	0.21	0.02	.51	
SEQ-C self-efficacy	−0.05	0.01	−.30	
BFQ-C conscientiousness	0.07	0.02	.19	
UCL-A passive coping	0.15	0.04	.18	
YSR somatic problems				.12*
BFQ-C neuroticism	0.13	0.02	.30	
SEQ-C self-efficacy	−0.04	0.01	−.21	
YSR ADH problems				.46*
ECS effortful control	−0.27	0.02	−.52	
BFQ-C conscientiousness	−0.16	0.02	−.32	
BFQ-C extraversion	0.15	0.02	.30	
BFQ-C neuroticism	0.10	0.02	.19	
YSR OD problems				.29*
BFQ-C neuroticism	0.15	0.02	.47	
BFQ-C conscientiousness	−0.08	0.01	−.26	
BFQ-C extraversion	0.05	0.01	.16	
YSR conduct problems				.32*
BFQ-C neuroticism	0.25	0.03	.42	
BFQ-C agreeableness	−0.18	0.03	−.27	
BFQ-C extraversion	0.13	0.03	.22	
BFQ-C conscientiousness	−0.12	0.03	−.19	
PCS-C self-control	−0.06	0.02	−.16	

Note: $N = 376$. YSR = Youth Self-Report, BFQ-C = Big Five Questionnaire for Children, CERQ = Cognitive Emotion Regulation Questionnaire, ECS = Effortful Control Scale, PCS-C = Perceived Control Scale for Children, SEQ-C = Self-Efficacy Questionnaire for Children, UCL-A = Utrecht Coping List for Adolescents, ADH = Attention-Deficit/Hyperactivity, OD = Oppositional Defiant. Regression analyses were controlled for gender, age, and ethnicity by entering these variables on step 0. * $P < .001$. All standardized betas were also significant at $P < .001$

Table 5 Results of the stepwise regression analyses in which psychopathology symptoms as indexed by the PQY were predicted from protective and vulnerability factors

	B	SE	*β*	R^2
PQY depression				.48*
BFQ-C neuroticism	0.56	0.04	.60	
SEQ-C self-efficacy	−0.11	0.02	−.28	
MSPSS social support	−0.13	0.03	−.18	
CERQ rumination	0.26	0.06	.17	
BFQ-C conscientiousness	0.14	0.04	.15	
PQY anxiety				.30*
BFQ-C neuroticism	0.39	0.04	.43	
SEQ-C self-efficacy	−0.12	0.02	−.29	
UCL-A passive coping	0.44	0.10	.23	
BFQ-C conscientiousness	0.16	0.04	.18	
PQY disruptive behavior				.36*
BFQ-C neuroticism	0.32	0.03	.52	
BFQ-C conscientiousness	−0.14	0.03	−.23	
SPPC self-esteem	0.04	0.01	.20	
BFQ-C agreeableness	−0.13	0.03	−.18	
PQY eating problems				.05*
SEQ-C self-efficacy	−0.03	0.01	−.24	
PQY substance use				.03*
BFQ-C conscientiousness	−0.06	0.02	−.19	

Note: $N = 376$. PQY = Psychopathology Questionnaire for Youths, BFQ-C = Big Five Questionnaire for Children, CERQ = Cognitive Emotion Regulation Questionnaire, MSPSS = Multidimensional Scale of Perceived Social Support, SEQ-C = Self-Efficacy Questionnaire for Children, SPPC = Self-Perception Profile for Children, UCL-A = Utrecht Coping List for Adolescents. Regression analyses were controlled for gender, age, and ethnicity by entering these variables on step 0. * $P < .001$. All standardized betas were also significant at $P < .001$

the YSR and the PQY are less suitable instruments for measuring these types of symptoms.

The present study relied on a multi-ethnic sample of adolescents, and on the basis of the literature one would expect to find considerable differences among youths with an original Dutch background and those from a non-Dutch descent (e.g., Yasui and Dishion 2007). While non-Dutch adolescents displayed somewhat higher symptom levels on a number of psychopathology scales (i.e., depression, behavior problems), no substantial differences were found between Dutch and non-Dutch samples of youths as for the relationships between protective/vulnerability factors and psychopathological symptoms. Several factors may have accounted for this result. For example, Dutch and non-Dutch youths all followed higher general secondary education or pre-university education, and it may well be that ethnic variations would have been observed if we had also included students from lower educational levels. In addition, it should be mentioned that the non-Dutch sample was still rather heterogeneous in terms of ethnicity, which means this group contained youths with various dissimilar cultural backgrounds.

Clear support was found for the concurrent validity of the recently developed short version of the PQY. More precisely, the PQY scales of anxiety, depression, and disruptive behavior correlated convincingly with their counterpart scales of the YSR (respectively anxiety problems, affective problems, and OD/conduct problems). The YSR does not contain scales for assessing eating problems and

substance use, and so the validity of these PQY scales could not be investigated. Although the observed correlations between comparable PQY and YSR scales were substantial, they were not as high as one might expect from indexes measuring similar constructs. This suggests that there are subtle differences between both questionnaires, with the PQY following the DSM-criteria more closely than the YSR.

Admittedly, the present study suffers from a number of limitations. To begin with, the current study was cross-sectional in nature, which means that it is not possible to interpret the data in terms of cause-effect relationships. In other words, it should be borne in mind that a significant correlation between a certain protective/vulnerability factor and symptom scores may indeed indicate that the pertinent factor plays a role in the etiology of psychopathology, but it is also possible that the occurrence of symptoms enhance youths' vulnerability or undermine their protective resources. In a similar vein, the data remain silent on how person-related protective and vulnerability factors interact with important environmental variables such as stressful life events and parenting, or the extent to which they mediate the development of psychopathological outcomes. Another shortcoming pertains to the fact that a large number of correlations were computed in this research, which enhances the risk of finding spurious links among various protective and vulnerability factors and psychopathological symptoms. To deal with this issue, we employed stringent criteria for identifying statistically significant results, and it should be noted that findings generally displayed a meaningful pattern. Further, in spite of the fact that the current investigation included a wide range of person-related protective and vulnerability factors, one has to acknowledge that there may still be other individual difference variables that play a role in the origins of psychological problems among youths. One example might be intelligence, which has been demonstrated to protect children against the development of later emotional and behavioral problems (Fergusson et al. 2005). In addition, 42% of the youths that were originally invited did not agree to participate in the study, which of course questions the representativeness of the current sample. Finally, the data were solely collected by means of self-report in non-clinical youths. Of course, it would have been preferable if we had also assessed youths' vulnerability, protective resources, and psychopathology symptoms from the parents' point-of view, and if we had included clinically referred adolescents suffering from clear-cut psychological problems. Despite these limitations, the current data provide support for the idea that psychopathology in youths is associated with multiple protective and vulnerability factors (Mash and Wolfe 2002; Wenar and Kerig 2000). Research on the etiology of emotional and behavioral disorders should increasingly shift their focus to multifactorial models. Studies like the present one may help researchers to select the factors that are most relevant for the type of disorder that they intend to study.

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