



## Relations among behavioral inhibition, Big Five personality factors, and anxiety disorder symptoms in non-clinical children

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### ABSTRACT

This study examined relationships between behavioral inhibition, Big Five personality factors, and anxiety disorder symptoms in non-clinical children aged 9–12 years ( $N = 226$ ), using children's self-report and parent-report data. Results indicated that behavioral inhibition is best characterized by low extraversion with a tinge of neuroticism. Further, behavioral inhibition was clearly associated with anxiety symptoms, even when controlling for the influence of Big Five personality factors (including neuroticism). These results indicate that although behavioral inhibition partly overlaps with basic personality factors, this temperament characteristic remains an important predictive variable of anxiety pathology in youths.

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### 1. Introduction

'Behavioral inhibition to the unfamiliar' can be regarded as a temperamental typology that is characterized by the tendency of children and adolescents to be unusually shy and to react with fear and withdrawal in novel, unknown, or challenging situations (Kagan, 1994).<sup>1</sup> Approximately 10% of young children clearly exhibit the signs of behavioral inhibition, and continue to display these characteristics during later childhood, adolescence, and adulthood (Kagan & Snidman, 2004). From a psychopathology perspective, behavioral inhibition is of interest because various studies have demonstrated that this temperament feature is associated with the development of anxiety symptoms (see for a review: Fox, Henderson, Marshall, Nichols, & Ghera, 2005). For example, longitudinal research by Biederman and colleagues (1993) has shown that behaviorally inhibited preschool children were more likely to develop serious anxiety problems during a 3-year follow-up period as compared to non-inhibited control children. Not only social phobia, but also separation anxiety disorder and multiple anxiety disorders were significantly more prevalent among children with behavioral

inhibition. In view of these and other research findings, it is not surprising that contemporary models on the etiology of childhood anxiety disorders include behavioral inhibition as an important factor increasing children's vulnerability to develop such emotional problems (Muris, 2007).

Some authors have argued that behavioral inhibition is the observable manifestation of the fundamental personality trait of neuroticism (e.g., Craske, 1997), which can be defined as the enduring tendency to experience negative emotional states (Matthews, Deary, & Whiteman, 2003). Indeed individuals who score high on neuroticism tend to respond more intensely to environmental stressors and often are self-conscious and shy, thereby exhibiting some of the classical signs of behavioral inhibition. Another basic personality trait that has been associated with behavioral inhibition is extraversion. More precisely, individuals who score low on extraversion engage less in social activities, are less assertive, and prefer to observe situations before they participate (Matthews et al., 2003), which of course strongly resembles the behavioral pattern that is so typical for behavioral inhibition. Thus, the temperamental typology of behavioral inhibition essentially seems to reflect a mixture of the personality traits of (high) neuroticism and (low) extraversion. So far, the empirical evidence for this notion is sparse and primarily coming from research in adult populations (Muris, Rassin, Franken, & Leemreis, 2007; Shatz, 2005).

Moreover, because behavioral inhibition has rarely been investigated in combination with neuroticism and extraversion, it remains unclear whether this temperament characteristic accounts for unique variance in anxiety symptoms beyond these basic

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<sup>1</sup> Note that Kagan's (1994) concept of behavioral inhibition refers to an observable temperament variable involving shyness, fearfulness, and withdrawal from novel situations. This is somewhat different from Gray's (1991) construct of behavioral inhibition, which pertains to a biologically-based personality factor reflecting individual differences in sensitivity to signals of danger and punishment.

personality traits. This is particularly relevant given the fact that some authors (e.g., Eysenck, 1967) have proposed that individual differences in vulnerability to anxiety are grounded on a combination of high neuroticism and low extraversion (see also Craske, 2003).

With these issues in mind, the current study was conducted. Non-clinical children aged 9–12 years completed self-report scales for measuring behavioral inhibition, Big Five personality traits (including neuroticism and extraversion), and anxiety disorder symptoms. In this way, it became possible to investigate (a) correlations among behavioral inhibition, personality traits, and anxiety disorder symptoms, (b) to what extent neuroticism, extraversion, and other personality traits account for unique variance in behavioral inhibition, and (c) whether behavioral inhibition accounts for unique variance in anxiety disorder symptoms after controlling for Big Five personality traits. As parents<sup>2</sup> filled out similar questionnaires to assess levels of behavioral inhibition, personality factors, and anxiety symptoms in their children, it became also possible to examine the same research issues from the parents' perspective.

## 2. Method

### 2.1. Participants

Parents of 377 schoolchildren of three primary schools in the neighborhood of Rotterdam, the Netherlands, were approached by mail. In the letter, parents received information about the study and were asked to give their consent about their child's participation. In addition, they were invited to complete parent versions of the questionnaires (see below) and to return materials in a sealed envelope. Two-hundred-and-fifty parents (66.3%) responded positively to the mailing. Children of these parents were asked to complete child versions of the questionnaires. This was done in classroom sessions during which a research assistant and the teacher were always present in order to ensure confidential and independent responding. Eventually, due to missing data and children being absent during the assessment session, data of 226 children (109 boys and 117 girls) and parents (155 mothers, 16 fathers, 39 both parents, and 16 other caretakers) were collected. These children had a mean age of 10.54 years ( $SD = 1.05$ , range 9–12 years) and more than 85% of them were from original Dutch descent.

### 2.2. Questionnaires

The *Behavioral Inhibition Questionnaire* (BIQ; Bishop, Spence, & McDonald, 2003) is a 30-item measure for assessing behavioral inhibition in various domains: social novelty (e.g., "I am shy when first meeting new children"), situational novelty (e.g., "I approach new situations or activities very hesitantly"), and physical challenges (e.g., "I happily explore new play equipment" [reverse item]). Items are scored on a 6-point scale ranging from 1 = *hardly ever* to 6 = *almost always*. After recoding reverse items, a total score can be computed (range 30–180), with higher scores being indicative of higher levels of behavioral inhibition. The reliability and validity of the BIQ are satisfactory (Bishop et al., 2003; Edwards, 2007), and this is also true for the Dutch version of the scale (Broeren & Muris, submitted for publication).

The *Big Five Questionnaire for Children* (BFQ-C; Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003) is a 65-item questionnaire for measuring the five basic factors of personality (i.e., the Big Five) in children and adolescents: (1) *extraversion* which refers to aspects such as activity, enthusiasm, assertiveness, and self-confi-

dence, (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. 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, Fida, Paciello, Di Giunta, & Caprara, 2008; Barbaranelli et al., 2003; Del Barrio, Carrasco, & Holgado, 2006; Muris, Meesters, & Diederer, 2005).

The revised version of the *Screen for Child Anxiety Related Emotional Disorders* (SCARED-R; Muris, Merckelbach, Schmidt, & Mayer, 1999) is an extension of the original SCARED (Birmaher et al., 1999) and measures symptoms of the entire spectrum of anxiety disorders that according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000) may occur in children and adolescents. Thus, the scale consists of 69 items measuring symptoms of separation anxiety disorder (e.g., "I don't like being away from my family"), generalized anxiety disorder (e.g., "I worry about things working out for me"), panic disorder (e.g., "When frightened, my heart beats fast"), obsessive-compulsive disorder (e.g., "I have thoughts that frighten me"), traumatic stress disorder (e.g., "I have frightening dreams about a very aversive event"), social phobia (e.g., "I am shy with people I don't know well"), specific phobia (e.g., "I am afraid of the dentist"), and school phobia (e.g., "I am scared to go to school"). Children and adolescents have to indicate how frequently they experience each symptom on a 3-point scale: 0 = *almost never*, 1 = *sometimes*, or 2 = *often*. In the present study, a SCARED-R total score was obtained by summing across all items, with higher scores reflecting higher levels of anxiety symptoms. Previous studies have shown that the SCARED-R possesses adequate reliability and validity (e.g., Muris, Dreesen, Bögels, Weckx, & Van Melick, 2004; Muris et al., 1999).

The parent versions of the BIQ, BFQ-C, and the SCARED-R are identical to the questionnaires completed by the children, except that instructions and items are rephrased in terms of the caregiver's perspective.

## 3. Results

### 3.1. General statistics

Before discussing the main results of the present study, a number of general findings should be discussed. First, all questionnaires were reliable in terms of internal consistency, with Cronbach's alphas varying between .75 and .93. Further, significant sex differences were found for a number of variables. More specifically, girls rated themselves as more behaviorally inhibited [means being 95.84,  $SD = 22.41$  vs. 88.38,  $SD = 22.19$ ;  $t(224) = 2.51$ ,  $p < .05$ ] and anxious [means being 29.38,  $SD = 17.34$  vs. 22.23,  $SD = 14.62$ ;  $t(224) = 3.34$ ,  $p < .01$ ] than boys. Second, parents rated girls as more agreeable [means being 37.74,  $SD = 4.71$  vs. 35.83,  $SD = 4.72$ ;  $t(224) = 3.04$ ,  $p < .01$ ] and conscientious [means being 34.46,  $SD = 6.12$  vs. 31.59,  $SD = 5.46$ ;  $t(224) = 3.72$ ,  $p < .001$ ], whereas they rated boys as more neurotic [means being 20.76,  $SD = 4.79$  vs. 19.14,  $SD = 4.78$ ;  $t(224) = 2.55$ ,  $p < .05$ ]. In the light of these differences, it was decided to control for sex in all further analyses. Third and finally, correlations between scores on child and parent questionnaires were all moderate but statistically sig-

<sup>2</sup> The terms 'parent' and 'parents' not only refer to children's biological parents but also to other caretakers (e.g., stepparents, grandparents, foster parents).

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