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Executive function moderates the association between fearful temperament and dimensions of perfectionism

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ABSTRACT

Previous research has shown that perfectionism is a dimensional construct and that it may be predicted by factors such as temperament and executive function. However, no previous studies have connected these lines of research. The current study sought to test a path model examining the role of fearful temperament, the cognitive shift domain of executive function, and their interaction on separate dimensions of perfectionism (SOP-critical, SPP, and SOP-striving). Participants were 56 parent–child dyads recruited from the community. Children were 7–13 years (51.8% male; 83.6% Caucasian, 9.1% African American). Overall the model fit the data well. Results indicated that fearful temperament and cognitive shift did not individually predict for any dimension of perfectionism. However, the interaction of fearful temperament and cognitive shift did predict for scores of SOP-critical and SPP, such that those children with higher cognitive shift deficits had a stronger effect of fearful temperament on dimensions of perfectionism. The interaction did not predict for scores of SOP-striving. These results, consistent with previous research, suggest that SOP-critical and SPP may represent maladaptive aspects of perfectionism, while SOP-striving may represent adaptive aspects of perfectionism. Further, it appears that maladaptive and adaptive perfectionism dimensions have separate developmental precipitants.

1. Introduction

Over the past two decades, empirical support for the dimensionality of perfectionism has grown (Stoeber & Otto, 2006). Maladaptive perfectionism has shown links with various negative outcomes whereas adaptive perfectionism is a reflection of positive striving and has not shown links with negative outcomes (Bieling, Israeli, Smith, & Antony, 2003; Herman, Wang, Trotter, Reinke, & Ialongo, 2013; McCreary, Joiner, Schmidt, & Ialongo, 2004). Hewitt and Flett (1991) further differentiated between self-oriented perfectionism (SOP), or requirements imposed by the individual on him/herself to be perfect, and socially prescribed perfectionism (SPP), or requirements perceived by the individual that others require him/her to be perfect. SOP, originally conceptualized as a single dimension, reflects two separate dimensions using the Child and Adolescent Perfectionism Scale (CAPS; Flett, Hewitt, Boucher, Davidson, & Munro, 1997): SOP-critical and SOP-striving. This has been confirmed through psychometric investigations of the CAPS (e.g., McCreary, Joiner, Schmidt, & Ialongo, 2004). SOP-critical and SPP represent maladaptive aspects of perfectionism, while SOP-striving represents adaptive aspects of perfectionism (McCreary et al., 2004). This split is similar to those observed in factor analytic studies concluding that perfectionism represents both maladaptive and adaptive aspects (Rice & Slaney, 2002). Current research has sought to find risk factors for the differentiation between maladapative and adaptive perfectionism.

Two internal risk factors that have received limited attention in previous studies are temperament and executive function. It has been proposed that temperamental traits such as fearful or inhibited temperaments may increase the likelihood of maladaptive perfectionism dimensions (Affrunti & Woodruff-Borden, 2014; Flett, Hewitt, Oliver, & Macdonald, 2002). Fearful temperament may increase levels of maladaptive perfectionism by increasing perceptions of threat of novel or challenging situations and apprehension about possible distress experienced in those situations. While research is sparse with children, undergraduate samples have provided preliminary evidence for this theory (Kobori, Yamagata, & Kijima, 2005; Randles, Flett, Nash, McGregor, & Hewitt, 2010). For example, in a study of 255 undergraduates, SOP and SPP were moderately correlated with behavioral inhibition (O'Connor & Forgan, 2007). Additionally, O'Connor and Forgan (2007) found a significant association between behavioral approach and SOP. Approach systems, which act opposite to inhibition and withdrawal, may lead to adaptive perfectionism, reflected by the SOP-striving dimension. Yet, despite these studies, it is unclear what the effect of fearful and inhibited temperament is on perfectionism dimensions in children. Further, temperament is plastic to other variables, such as executive function, in children (Degnan & Fox, 2007; Rothbart, Sheese, & Posner, 2007).

Executive function includes three separate but related core systems: inihibitory control, working memory, and cognitive shifting (Miyake

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et al., 2000). It has been theorized that the cognitive shift deficits may put a child at risk of developing maladaptive perfectionism (Affrunti & Woodruff-Borden, 2014). Despite theory, only a single study has examined the effect of cognitive shift on perfectionism. Using a sample of 34 adults, deficits in set shifting were significantly correlated with retrospective reports of perfectionism in childhood (Tchanturia et al., 2004). The use of adults and retrospective reports of childhood perfectionism limit the conclusions. No study has examined cognitive shift and perfectionism in children. Studies are needed to understand the effect of cognitive shift deficits in dimensions of child perfectionism.

Cognitive shift deficits, in tandem with a fearful temperament, may place a child at risk of developing difficulties with perseveration on perceived threat in novel and challenging situations. Models of the development of self-regulation theorize that higher order cognitive functions, such as attentional control and regulation, modulate temperamental reactions (Rueda, Posner, & Rothbart, 2005). Thus, executive function may moderate, rather than mediate, relations between temperament and child outcomes. Among fearful or behaviorally inhibited children, those without associated cognitive control deficits demonstrate better social and emotional outcomes (Oldehinkel, Hartman, Ferdinand, Verhulst, & Ormel, 2007). Children who experience social reticence or withdrawal from novel experiences and cannot flexibly shift away from distress, may be at risk for the development of psychiatric symptoms (White, McDermott, Degnan, Henderson, & Fox, 2011). As such, cognitive shift and fearful temperament may interact to predict increased levels of maladaptive perfectionism.

The current study sought to examine the role of fearful temperament and cognitive shift in separate dimensions of child perfectionism, within a single model using path analysis. This represents an important addition to the literature as it may inform how internal factors place children at risk of developing maladaptive perfectionism. Of note, in order to examine whether the effects of fearful temperament and cognitive shift were limited to maladaptive aspects of perfectionism (i.e., SPP and SOP-critical), all three domains (i.e., SPP, SOP-critical, and SOP-striving) were included in the current study. Based on the limited extant literature linking fearful temperament and cognitive shift to perfectionism in undergraduates and adults, we hypothesized that fearful temperament and cognitive shift would predict for increases in SPP and SOP-critical. Further, based on the theory that fearful temperament and cognitive shift may exert additive effects on perfectionism (Affrunti & Woodruff-Borden, 2014; Flett et al., 2002), we hypothesized that the interaction of fearful temperament and cognitive shift would predict for increases in SPP and SOP-critical.

2. Method

2.1. Participants and procedures

All participants were recruited as part of a larger study examining risk factors implicated in the development of child internalizing symptoms. Participants were recruited through elementary and middle schools, contacts in the local community, and flyers distributed throughout the community. The study was approved by the university Institutional Review Board. Both child assent and parent consent were required for participation in the study.

Participants were 56 parent–child dyads from two moderately-sized urban areas and their respective surrounding areas. Children were between the ages of 7 and 13 years ($M = 9.4$, $SD = 1.7$), were primarily Caucasian (83.6%; 9.1% African American), and there was approximately an even split of males and females (51.8% male). Parents were mostly mothers (96.4%), ranged in age from 29 to 52 years old ($M = 40.26$, $SD = 5.4$), had an annual family income of 60,000 US dollars or more (70.6%), were married (87.3%), had a bachelor's degree or higher level of education (71.2%), and were employed full-time (75%; 15.4% part-time).

2.2. Measures

2.2.1. Temperament

The Temperament in Middle Childhood Questionnaire (TMCQ; Simonds & Rothbart, 2004) was used to assess fearful temperament in children. The TMCQ is a parent-report measure consisting 157 items that measure 17 different facets of temperament. For the purposes of this study, only the 9 item fear subscale was used. The fear subscale measures the amount of worry or nervousness related to anticipated distress and threatening situations (Simonds & Rothbart, 2004). There is high convergent validity between the TMCQ and other measures of fearful temperaments (e.g. Goldsmith, Rieser-Danner, & Briggs, 1991). Parents are asked to denote how true a description of the child's reaction (e.g. "Can stop him/herself when s/he is told to stop") has been within the past six months on a 5-point Likert scale from 1 (*almost always untrue*) to 5 (*almost always true*). The scale uses a mean score of the 9 items, with a possible range of 1–5. Higher scores indicate a greater fearfulness or worry. The internal consistency for the fear subscale in the current sample was $\alpha = 0.76$.

2.2.2. Executive function

The Behavior Rating Inventory of Executive Function – Parent Form (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000) was used to assess executive function in children. The BRIEF is a parent-report questionnaire containing 86 items. It measures dimensions of executive function as manifested in everyday life. The BRIEF has shown to be a valid and reliable measure of executive function, showing replication among different pediatric populations (see Donders, DenBraber, & Vos, 2010; Isquith, Gioia, & Espy, 2004) and convergence with performance-based measures (Toplak, Bucciarelli, Jain, & Tannock, 2008). Parents are instructed to indicate how often their child exhibits problems with specific behaviors (e.g. makes careless errors). The measure uses a 3-point Likert scale, from 1 (*never*) to 3 (*often*). For the purposes of this study, the 8-item shift subscale was used. Shift is defined as the ability to flexibly solve problems, switch or alternate attention and change mindset from one topic to another (Gioia et al., 2000). The subscale yields a raw score, ranging from 8 to 24, which is then converted to a standardized T score. T scores were normed separately for children between 7 and 10 years old and 11 and 14 years old, for both males and females. All analyses were run using the T scores. Higher scores on the shift subscale reflect a greater inability to shift. The BRIEF has shown high test-rest reliability over a two week period in separate samples ($r = 0.76$ to $r = 0.85$; Gioia et al., 2000). In the current sample, the internal consistency for the shift subscale was $\alpha = 0.80$.

2.2.3. Child perfectionism

The Child and Adolescent Perfectionism Scale (CAPS; Flett et al., 1997) was used to assess child perfectionism. The CAPS is a self-report questionnaire consisting of 22 items. Children denote how true certain statements are using a 5 point Likert scale from 1 (*false*) to 5 (*very true of me*). The CAPS was originally developed to measure two aspects of perfectionism: self-oriented perfectionism (SOP), or standards imposed by the child on him/herself to be perfect and socially-prescribed perfectionism (SPP), or the belief that others require the child to be perfect. Previous research examining the psychometrics of the CAPS has shown that a three factor solution accurately accounts for how scores cluster (McCreary et al., 2004; O'Connor, Rasmussen, & Hawton, 2010) and better differentiates between adaptive and maladaptive perfectionism. These three factors also better reflect common conceptualizations of perfectionism as adaptive and maladaptive (Herman et al., 2013). The current study uses this three-factor solution. The CAPS has shown satisfactory psychometric properties with adequate internal consistency (SOP $\alpha = 0.83$, SPP $\alpha = 0.84$) and test-retest reliability over a 5-week period (Mitchell, Broeren, Newall, & Hudson, 2013). The CAPS has also shown to have acceptable test-retest reliability and intraclass correlations ($ICC = .61$–$.65$) over 6 months (O'Connor et al.,