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Retrospective reports of behavioral inhibition and young adults' current symptoms of social anxiety, depression, and anxious arousal☆

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ABSTRACT

The primary goal of this study was to investigate the specificity of the social versus nonsocial components of self-reported behavioral inhibition during childhood with young adults' current symptoms of anhedonic depression, social anxiety, and anxious arousal. As hypothesized, the social component of BI demonstrated some specificity for symptoms of social anxiety versus other internalizing disorders. Furthermore, results support the hypothesis that the relationship between BI and depressive symptoms is mediated by levels of social anxiety and anxious arousal.

1. Introduction

Anxiety and mood disorders account for the vast majority of individuals suffering from mental health problems (Kessler, Tat Chiu, Demler, & Walters, 2005). Given this, it is important to gain a better understanding of the shared and unique vulnerabilities to these forms of psychopathology so that more effective prevention and early intervention efforts can be developed. One potentially important risk factor is childhood temperament, which can be understood as one's natural disposition toward his or her physical and interpersonal world (Rothbart, Ahadi, & Evans, 2000). A child's temperament is believed to have a notable impact on the way in which the child adapts to his or her world (Rothbart et al., 2000). The temperament style of behavioral inhibition (BI) is characterized by reticence to interact with novel people and situations (Garcia-Coll, Kagan, & Reznick, 1984), and may represent a shared vulnerability for internalizing disorders such as anxiety and depression. In considering the role of BI in the subsequent development of psychopathology, previous research has largely focused on the role of BI in the development of pathological anxiety (Rosenbaum et al., 1993), and more specifically, social anxiety (Hirshfeld-Becker et al., 2008). This research has suggested that children with elevated levels of BI are more likely to develop social phobia later in life (Hayward, Killen, Kraemer, & Taylor, 1998; Hirshfeld-Becker et al., 2007; Schwartz, Snidman, & Kagan, 1999). For example, Hirshfeld-Becker et al. (2007) found that children's levels of BI significantly predicted new onset of social phobia (but not other anxiety disorders) 5 years later. This link between BI and elevated social anxiety has also been supported in a number other studies (Biederman et al., 2001; Coles, Schofield, & Pietrefesa, 2006; Gladstone, Parker, Mitchell, Wilhelm, & Mali, 2005; Mick & Telch, 1998; Neal, Edelman, & Glachan, 2002).

More recently, there has been evidence to suggest that BI may be a more general risk factor for internalizing disorders. For example, studies have suggested that childhood BI may also be related to internalizing disorders such as panic disorder (Rosenbaum, Biederman, Hirshfeld, Bolduc, & Chaloff, 1991), obsessive–compulsive disorder (Van Ameringen, Mancini, & Oakman, 1998; Coles et al., 2007), and depression (Caspi et al., 1997; Jaffee et al., 2002). Thus, there is evidence to suggest that BI may represent a general vulnerability factor for internalizing disorders rather than a specific predisposition to social phobia.

Although the majority of studies have focused on BI generally, there is increasing evidence for the utility of differentiating social versus nonsocial components of BI. These separate components were included in the original identification of BI as "the behavioral tendency to be extremely inhibited ... to unfamiliar people or events" (Garcia-Coll et al., 1984, p. 1018). The social component of

☆ To be clear, throughout this paper the construct of "behavioral inhibition" refers to a temperament trait characterized by reticence to interact with novel social and nonsocial stimuli. A related, but somewhat different construct is similarly referred to as the "behavioral inhibition system." This latter construct refers to the motivational system originally defined by Gray (1981) and will not be addressed in this manuscript.

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BI is characterized by reticence to approach/interact with strangers and unfamiliar people, whereas the nonsocial component is characterized by behavior such as reticence to explore unfamiliar surroundings and fearfulness when faced with novel or potentially threatening situations (e.g., school, a dark room). Importantly, factor analyses conducted in previous research support the separability of behaviors reflecting social inhibition in contrast to behaviors reflecting nonsocial inhibition in children as young as 2 years old (Kochanska, 1991). Furthermore, these domains of BI may be differential predictors of social behavior in children. For example, in one study of children, social BI predicted subsequent shy behavior in peer interactions and decreased affect in fantasy play (e.g., less expressive behavior while playing "make believe"), whereas nonsocial BI only predicted decreased participation in group play (engaging with peers while playing; Kochanska & Radke-Yarrow, 1992).

Additional support for the distinction between social and nonsocial BI is provided by a growing body of research suggesting that the two components may have differential relations with different internalizing disorders. Specifically, several studies have suggested that social anxiety is more strongly associated with social BI than nonsocial BI (Mick & Telch, 1998; Neal et al., 2002), whereas symptoms of other anxiety disorders may be similarly correlated with the two BI components (Coles et al., 2007; Mick & Telch, 1998; Neal et al., 2002; Van Ameringen, Mancini, & Oakman, 1998). This suggests that whereas nonsocial BI may play a role in multiple anxiety disorders, social BI may show some specificity to social anxiety symptoms.

Potential relations between components of BI and depression have received less empirical attention. The existing literature suggests that this temperament style may serve as a precursor to depression as well as anxiety, though the nature of this relation remains unclear. Specifically, although one study of adults found that symptoms of depression were more strongly related to social than nonsocial BI in childhood (Neal et al., 2002), another study of high school students suggested that nonsocial BI ("fearfulness"), but not social BI, increased risk for future depression (Hayward et al., 1998). Given the discrepancy in ages across the two aforementioned samples (mean ages of 43 versus 15 years), it is difficult to assess whether the later project is best conceived as a failure to replicate, or whether developmental factors influenced the different patterns of findings. Thus, the current study focuses on a study of young adults (an intermediate age between those used in the two prior studies) as a means to address this gap in the literature addressing the relationship between BI and mood/anxiety symptoms.

In considering the relation between BI and depression, it is important to note that individuals suffering from anxiety disorders are at an increased risk for developing depression in comparison to non-anxious individuals (Stein et al., 2001), and evidence suggests that in many instances the presence of an anxiety disorder precedes the development of major depression (Brown, Campbell, Lehman, Grishman, & Mancill, 2001). Given such temporal relationship between anxiety and depression, it is important to consider that associations between BI and depression may be largely contingent upon the presence of anxiety. In fact, one study found that social anxiety fully mediated the relation between BI and depression (Gladstone & Parker, 2006), supporting the hypothesis that the link between childhood BI and later depression was not direct, but rather mediated by the presence of social anxiety symptoms.

The primary aim of the current study was to examine relations between behavioral inhibition (social versus nonsocial) and symptoms of anxiety and depression in young adults. We examined specificity of the general construct of behavioral inhibition to symptoms of social anxiety, nonsocial anxiety (anxious arousal; cf. Clark and Watson, 1991), and depression. We hypothesized that behavioral inhibition would be significantly associated with all three forms of internalizing symptoms. However, given previous research supporting the strength of the relation between BI and social anxiety (Hirshfeld-Becker et al., 2008), we hypothesized that BI would be more strongly related to social anxiety than the other symptom domains. Second, we examined the utility of differentiating the social versus nonsocial components of BI. We hypothesized that the social component of BI would be significantly more strongly related to young adults' current levels of social anxiety than would nonsocial BI. We hypothesized that strength of the relations between the two domains of BI with symptoms of anxious arousal would be similar. Predictions as to relative importance of the two domains of behavioral inhibition were not made for depression, given conflicting data on the role of social behavioral inhibition and depression (Neal et al., 2002; Hayward et al., 2002) and the age discrepancy between the participants in the current study and previous research. Finally, we tested the hypothesis that symptoms of anxiety (both social anxiety and anxious arousal) would mediate the relations between social and nonsocial BI and depression. For this meditational model, we expected to replicate previous research indicating that the relation between childhood BI and symptoms of depression would be mediated by social anxiety (Gladstone & Parker, 2006). Further, given that depression is typically preceded by symptoms of anxiety (Brown et al., 2001), we also predicted that symptoms of anxious arousal would mediate the BI–depression relationship.

2. Method

2.1. Participants and procedure

Participants in this study were 247 undergraduate students (73% female). The mean age for the sample was 19.17 (*SD* = 2.63). Seventy percent of the sample was Caucasian, 13% were Asian/Asian American, 5% were African American, 6% were Hispanic, and 6% reported their ethnicity as "other."

2.2. Measures

2.2.1. Behavioral inhibition

The Retrospective Self-Report of Inhibition (RSRI; Reznick, Hegeman, Kaufman, Woods, & Jacobs, 1992) is a retrospective self-report questionnaire used to assess levels of behavioral inhibition exhibited during childhood (i.e., grades 1–6). The RSRI consists of 30 items rated on a Likert-type scale from 1 to 5 (the anchors for this scale vary depending on the question; e.g., never → very often or 0–4 days → 20 or more days), with higher scores reflecting higher levels of behavioral inhibition. Total and subscale scores are computed by determining the mean item scores (cf. Reznick et al., 1992). Items were developed to refer to specific events/situations (e.g., "Did you have a nightlight?") rather than subjective impressions so as to reduce the influence of mood or current psychopathology (Reznick et al., 1992). The RSRI consists of two factors, consistent with the social and nonsocial components of behavioral inhibition: (1) school and social situations (12 items), and (2) fear and illness (12 items), a factor structure that has been supported in several studies (Coles et al., 2006; Neal et al., 2002; Reznick et al., 1992; Van Ameringen, Mancini, & Oakman, 1998). Supporting the convergent validity of the scale previous research has demonstrated that scores on the RSRI are significantly correlated with symptoms of anxiety disorders such as agoraphobia, social phobia and depression (Neal et al., 2002; Van Ameringen, Mancini, & Oakman, 1998) as well as obsessive–compulsive disorder (Coles et al., 2006). Further, supporting the