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What is the contribution of different cognitive biases and stressful childhood events to the presence and number of previous depressive episodes?

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ABSTRACT

Negative cognitive biases as well as stressful childhood events are well-known risk factors for depression. Few studies have compared the association of different types of biases and events with depression. The current study examined whether different cognitive biases and stressful childhood events variables were associated with depression and recurrence. Three types of childhood events were assessed in 83 never-depressed and 337 formerly depressed individuals: trauma within the family, trauma outside the family, and adverse events. Furthermore, after a sad mood induction procedure, participants executed a Dot Probe task (selective attentional bias), an Emotional Stroop task (attentional interference bias) and an incidental learning task (memory bias). The association of these measures with case status and recurrence status (one or multiple past episodes) was examined. Negative memory bias and traumatic childhood events within the family were associated with case status, whereas none of the bias measures or childhood events variables were associated with recurrence status. The results indicate that memory bias as well as the experience of aggression and/or abuse within the family during childhood are independently associated with depression. Biases and stressful childhood events did not offer differentiation between individuals with one or multiple past episodes.

1. Introduction

Mood disorders result in a high disease burden as well as increased mortality risk due to important impairments in social, emotional and physical functioning. The World Health Organization estimates that depression will be the number two cause of lost years of healthy life worldwide by the year 2020. Moreover, relapse rates are high and increase substantially with the experience of multiple depressive episodes (Clark et al., 1999; Ramana et al., 1995; Pettit et al., 2006; Curry et al., 2011). It is therefore important to identify risk factors for depression and to understand the underlying environmental and psychological mechanisms of its pathogenesis.

The cognitive theories state that biased processing of emotional information is a strong contributor to the development as well as the recurrence of depression (Beck, 1987, 2008; Mathews and MacLeod, 1994, 2005; Gotlib and Joormann, 2010). Depressed individuals are inclined to have better memory for negative than for positive information, while the reverse is true for never-depressed individuals (Matt et al., 1992; Ridout et al., 2009). Depressed individuals also show selective attention towards negative information and more attention interference of negative information (Gotlib and Joormann, 2010; Peckham et al., 2010). What is more, after recovery from depression, transient sadness is construed as a stressor able to trigger depressogenic factors, such as biased cognitive processing (McCabe et al., 2000; Scher et al., 2005; Joormann and Gotlib, 2007; Gupta and Kar, 2012). Sad mood induction procedures are often used to trigger cognitive biases in remitted depressed individuals (Liotti et al., 2002) and response to such procedures has been associated with risk for depression relapse (Segal et al., 1999; Teasdale et al., 2000; Kupfer and Frank, 2001). Attention and memory biases are assumed to engender and maintain negative thinking, rumination and low mood (Beck, 2008). Cognitive biases have also been observed in highly neurotic,

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never-depressed individuals (Chan et al., 2007), who are at increased risk of depression and in never-depressed family members of depressed individuals at a higher rate than in the general population (Jaenicke et al., 1987; Taylor and Ingram, 1999; Joormann et al., 2007; Van Oostrom et al., 2013), underlining its potential as vulnerability factor.

Other widely studied risk factors for depression in adulthood are stressful childhood events (Kendler et al., 1999; Alloy et al., 2006; Hovens et al., 2010). Experiencing negative events in childhood often leads to dysfunctional basic assumptions about the self and the world (Beck, 2008). These assumptions form the basis of cognitive biases, as information is processed in accordance with the dysfunctional cognitions. Subsequent stressful events may trigger biased processing, such as negatively biased attention and memory, and leave individuals vulnerable for developing symptoms of depression or to relapse (see cognitive models of depression, Beck, 1987, 2008; Bower, 1981; Abramson et al., 1989; Williams et al., 1997). Although many studies have focused on stressful childhood events as a predisposing factor, there is generally little understanding of or consensus about the specificity of different types of events in association with depression (Gibb et al., 2001). When it comes to stressful childhood events, researchers generally do not distinguish between more general adverse events and interpersonal traumatic events nor between traumatic events that occurred within or outside the family of origin, although these distinctions are clinically highly relevant (Margolin and Gordis, 2000). Traumatic childhood events are proposed to have most detrimental effects (Swanson and Mallinckrodt, 2001; Hovens et al., 2010; Spinhoven et al., 2010). If a child experiences severely stressful interpersonal events purposely directed at the child – especially when inflicted by a caregiver that should ensure safety – negative basic assumptions about the self and the world may be formed (Jehu et al., 1985–1986). Traumatic events may have stronger effect on the course and severity of depression than non-traumatic adverse events.

In a similar vein, when examining cognitive vulnerability to depression, many different measures have been used to study different types of cognitive biases (e.g., Beevers et al., 2007; Joormann et al., 2007; Dearing and Gotlib, 2009). In depression, some of the most widely studied domains are attentional interference, selective attention and explicit incidental memory, using the Emotional Stroop task, the Dot Probe task and the self-referential memory task, respectively (Bradley et al., 1997a, 1997b; Gotlib et al., 2004). Although many studies focus on 'cognitive vulnerability to depression', the methods used and domains involved often differ and are only seldom studied within one sample. Based on the cognitive theories of depression, one would expect similar preferential processing of negative information in different cognitive domains. However, the evidence for this is limited and inconsistent (Gotlib et al., 2004; Everaert et al., 2012; Vrijsen et al., in press). Moreover, some cognitive theories and studies indicate that memory bias might be more characteristic of depression than biased attention (Ingram, 1984; Matt et al., 1992; Williams et al., 1997; Vrijsen et al., in press). Notwithstanding the current focus on biases as well as stressful childhood events as vulnerability factors for depression, surprisingly little attention has been paid to examining the specific contribution of different types of biases and events to depression vulnerability within one sample. Moreover, although the cognitive theories assume an association between childhood events and biased processing, this has not received much attention so far. In order to guide future studies on depression vulnerability, it seems important to study different cognitive biases as well as different stressful childhood events measures *within the same clinical sample*. Also the distinction between risk factors for the onset and recurrence of depression have received little attention so far (Monroe and Harkness, 2011). However, the conditions that bring on a first episode of depression may differ in from the conditions that bring on subsequent episodes (Monroe and Harkness, 2005; Pettit et al., 2006).

The aim of the study was two-fold. First, the assumption was tested that both cognitive biases and stressful childhood events are associated with depression, and that they may interact to increase vulnerability. More specifically, the current study examined the association of several childhood life events variables, as well as selective attentional bias, attention interference bias and memory bias with case status (never-depressed or formerly depressed) and recurrence (one or multiple past episodes). The second aim was more exploratory in nature, as the differentiating effect of these widely used bias and stressful childhood events measures was compared. We expected to find a clear association between childhood trauma and case status, whereas we did not have a specific hypothesis for the association with childhood adversity (Hovens et al., 2010). Although speculative, memory bias may be associated with case status above and beyond attentional biases (Matt et al., 1992). One could also predict that stronger negative bias and more severe childhood events are also associated with relapse. However, after a first episode, the onset of depressive episodes may become more spontaneous and less strongly linked to stressful events (Kessler and Magee, 1993; Post et al., 1996; Monroe and Harkness, 2005), and biased processing may not offer additional differentiation after individuals have experienced a first episode (in line with the 'scar hypothesis', Lewinsohn et al., 1981).

2. Method

2.1. Participants

This study is part of the 'Info in Genes' study, which aims to link cognitive biases to genetic susceptibility to depression and includes several computer tasks. Only data of three computer tasks are discussed here. A sample of 337 formerly depressed and 83 never-depressed individuals participated in the study. A formerly depressed sample was selected to minimize reverse causation (current depressive state influencing retrospective report of childhood events), as well as depressive state affecting cognitive biases. In formerly depressed individuals, the average number of previous episodes was 3.53 (S.D.=1.88). The formerly depressed individuals were recruited at the Department of Psychiatry of the Radboud University Medical Centre, as well as via HSK, a private regional mental health care organization. Participants were included in the formerly depressed group if they met the criteria of the DSM-IV (American Psychiatric Association, 1994) for a previous depressive episode. Exclusion criteria for both groups were: current depressive episode, current or lifetime bipolar disorder, current psychotic symptoms, alcohol or substance abuse within the past 6 months, deafness, blindness, neurological disorder, sensorimotor handicaps and intellectual disability. The never-depressed individuals were recruited via local newspapers, online postings at the medical centre's website and a local training centre. The never-depressed individuals did not have a current or previous diagnosis of depression. In order to assess in- and exclusion criteria, trained professionals interviewed eligible participants with the Structured Clinical Interview for the DSM-IV Axis-I disorders (SCID-I; First et al., 1996). The SCID-I has been demonstrated to have a good reliability (Skre et al., 1991; Williams et al., 1992). All interviewers had extensive training in the use of the SCID-I, as well as previous experience in administering structured clinical interviews to psychiatric patients. Participants received a gift certificate in return for their participation.

2.2. Materials and apparatus

2.2.1. Stressful childhood events, depressive symptomatology, neuroticism and medication use

Stressful childhood events were assessed with an adapted version of the Life Events Questionnaire (e.g., Gerritsen et al., 2011; Van Oostrom et al., 2012). This questionnaire has good psychometric properties (Brugha and Cragg, 1990). Participants were asked to indicate whether they had experienced a set of life events (e.g., parental loss, sexual abuse or serious health problems) before the age of 16 years, after the age of 16 and/or within the last year. Two childhood trauma variables were calculated: one variable representing the number of traumatic events (aggression and/or abuse) involving a family member before the age of 16 and a second variable representing traumatic events before the age of 16 where the