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Research report

Mood-incongruent processing during the recall of a sad life event predicts the course and severity of depression

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ABSTRACT

Background: Previous studies suggest that mood-incongruent processing constitutes an adaptive mood regulation strategy, and that difficulties in this process may contribute to the maintenance of depression. However, no study has yet examined whether mood-incongruent processing predicts the course and severity of clinical depression.

Methods: To address this question, the present study used a prospective, longitudinal design to examine the effects of mood-incongruent processing in a sample of 59 clinically depressed patients. At baseline, participants were asked to recall and describe a sad and a happy life event. Participants' utterances were transcribed and analysed using computerized text analysis. Negated emotion words were excluded. The proportion of positive emotion words during sad memory recall was used as an indicator of mood-incongruent processing. After 6 months, participants were re-assessed for symptom levels and the criteria of major depressive disorder (MDD) during the follow-up period.

Results: Higher relative frequency of positive emotion words during sad memory recall was associated with less symptoms of depression at follow-up and shorter time to recovery from MDD, over and above baseline symptoms of depression. The effect was not just due to increased general positivity in emotional expression or emotional expressiveness per se.

Limitations: The sample size and the timeframe for the follow-up assessment were limited. Furthermore, it is unknown to which degree word use reflects the actual experience of the expressed emotions.

Conclusions: The findings highlight the role of mood-incongruent processing in the maintenance of depression and advocate a stronger focus on mood-incongruent processing in the treatment of depression.

1. Introduction

Sustained negative affect and reduced positive affect are the predominant features of major depressive disorder (MDD; APA, 2013). Several authors have suggested that these affective disturbances may result from altered cognitive processes of affect regulation (Campbell-Sills and Barlow, 2007; Gross and Muñoz, 1995; Joormann and D'Avanzato, 2010; Joormann and Quinn, 2014). One central mechanism in the regulation of negative mood states refers to the retrieval of mood-incongruent cognitions (Forgas and Ciarrochi, 2002; Joormann and D'Avanzato, 2010). For instance, recalling positive autobiographical memories can serve to repair a sad mood state (Erber et al., 1996; Forgas, 1995; Forgas and Ciarrochi, 2002) whereas mood-congruent recall maintains sad mood states and depression (Matt et al., 1992; Williams et al., 1997). Based on those empirical findings, Forgas and Ciarrochi (2002) have argued in their model of homeostatic cognitive strategies in affect regulation, that mood-congruent cognitions often maintain or even enhance pre-existing affective states in a self-perpetuating process of affect infusion until a certain threshold level of affect intensity is reached. At this point, a different process may occur that provides access to mood-incongruent cognitions in order to reverse mood effects. Thus, the two countervailing cognitive processes of mood-congruent vs. mood-incongruent information processing may serve as a dynamic, homeostatic affect regulation system. This utilization of mood-incongruent cognitions for mood regulation seems to be disturbed in depression. For example, individuals with high levels and longer durations of self-

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reported symptoms of depression were less able to retrieve mood-incongruent cognitions after a negative mood induction and also reported less mood repair than those with low levels of self-reported depressive symptoms (Capecelatro et al., 2013; Josephson et al., 1996). Correspondingly, Joormann and colleagues found reduced accessibility of positive autobiographical memories after a sad mood induction and less corresponding mood repair in dysphoric as well as currently and formerly-depressed individuals (Joormann and Siemer, 2004; Joormann et al., 2007). Similarly, formerly depressed individuals rate their cue-induced positive autobiographic memories as less vivid than never-depressed individuals when asked to retrieve such after a negative mood induction (Werner-Seidler and Moulds, 2011). In addition, we have shown in a previous study that formerly-depressed individuals retrieved less positive emotion words during the recall of a sad autobiographical event than never-depressed individuals (Brockmeyer et al., 2012). More generally, patients with depression feature decreased cognitive flexibility in the processing of emotional material (Murphy et al., 2012) and are slower and less specific in retrieving positive autobiographic memories (Williams and Scott, 1988). Further evidence for such mood-congruent cognitive biases and reduced memory for positive information in depression comes from neuroimaging studies that have shown associations between these biases and altered brain activation including the amygdala and posterior cingulate cortex (Nandrino et al., 2004; van Wingen et al., 2010).

Taken together, the findings outlined above suggest that mood-incongruent information processing constitutes an important mechanism of mood regulation that alleviates negative mood states and contributes to a more favorable course of and faster recovery from depression. No study, however, has yet examined whether mood-incongruent information processing predicts the course and future severity of clinical depression. Thus, the present study investigated whether difficulties in retrieving mood-incongruent emotion words during the recall of a sad autobiographical event predict the course and severity of MDD in a clinical sample of depressed patients. We expected that less retrieval of positive emotion words during sad memory recall would predict a later recovery from MDD during a 6-months follow-up period and stronger symptoms of depression at the time of the follow-up assessment. To counter-check the specificity of the hypothesized effect of mood-*incongruent* processing, we also assessed mood-*congruent* processing [i.e. (a) negative emotion words during sad memory recall to rule out that increased emotional expressiveness per se is associated with a more favorable course and less severity of depression, and (b) positive emotion words during the recall of a happy life event to rule out that increased expression of positive emotions in general is associated with a more favorable course and less severity of depression].

2. Method

2.1. Participants

Participants were recruited from the department of psychiatry of a community hospital and from a large outpatient psychotherapy center. To take part in the study, participants had to be between 18 and 60 years of age, and had to meet criteria for a current DSM-IV diagnosis of MDD. Exclusion criteria were: comorbid substance abuse or dependence, a lifetime diagnosis of bipolar disorder, and psychosis, according to the DSM-IV. In order to assess their eligibility, all participants were interviewed by trained clinical psychologists with the Structured Clinical Interview for DSM-IV Axis I and II (SCID) (Wittchen et al., 1997).

An a priori power analysis revealed that a total sample size of 55 participants will have 80% power to detect a medium effect size of $f^2=0.15$ using a linear multiple regression (fixed model, R^2 increase) with one predictor tested (i.e. mood-incongruent processing) and 3 predictors in total (i.e. baseline symptoms and chronicity of depression) with a 0.05 two-tailed significance level. Taking potential losses to follow-up into account, we aimed at assessing 60 participants in total. The study sample was composed of patients with either chronic ($n=30$) or non-chronic ($n=30$) MDD and has been described previously (Brockmeyer et al., 2015). Because these two subgroups of depressed patients neither differed in symptoms of depression nor in the retrieval of positive and negative emotion words during positive and negative memory recall nor in any socio-demographic or other basic clinical variable such as age, gender, current psychotropic medication and current psychotherapeutic treatment (all $ps > .108$) they were treated as one group of MDD patients for the purpose of the present study. One participant refused to take part in the Emotional Processing Task. Thus, analyses in the present study are based on the available data from 59 patients with MDD. Five participants were completely lost to follow-up. Another participant provided self-report data at follow-up but did not take part in the follow-up interview, and one other participant took part in the follow-up interview but did not provide self-report data at follow-up. Thus, the primary analyses were based on the data from 52 patients.

2.2. Measures

2.2.1. Longitudinal Interval Follow-Up Evaluation (LIFE)

The course of depression was assessed using the LIFE (Keller et al., 1987; Wolf et al., 2005). The LIFE is a semi-structured interview rating system that allows for a retrospective assessment of the longitudinal course of mental disorders. In the present study, the LIFE was used to assess the presence and severity of MDD over the 26-weeks follow-up period using weekly psychiatric status ratings (PSR) that are based on DSM-IV criteria, ranging from 1 (no symptoms) to 6 (severe symptoms and dysfunction). PSR levels 5 and 6 refer to full MDD criteria. The LIFE was conducted by an experienced clinical psychologist who was specifically trained in the administration of the interview. Interviews were conducted by telephone, which yields comparable results like face-to-face interviews (Rohde et al., 1997). The 6-months follow-up period was chosen as a common time frame (Arditte and Joormann, 2011; Brewin et al., 1999) and because previous studies have shown that the cumulative probability of remission onset after 6 months ranges between 0.6 and 0.8 (Keller and Shapiro, 1982; O'Leary et al., 2010).

2.2.2. Beck Depression Inventory-II (BDI-II)

In order to assess the severity of depressive symptoms, participants completed the BDI-II (Beck et al., 1996; Kühner et al., 2007), both at baseline and at 6-months follow-up.

2.2.3. Emotional Processing Task

In order to examine positive and negative emotional processing, we adopted a similar task like the one introduced by Rottenberg, Hildner, and Gotlib (2006). Participants were asked to report on one of the saddest and one of the happiest moments they had experienced together with other people in their lives. Initially, participants were provided with some typical examples of sad events (e.g. the loss of a loved one) and guided by standardized questions to focus on one single, specific event instead of repeated events or enduring phases of negative experiences. After establishing one specific event, participants were asked to recall the context of the sad event to elicit as much details as possible. The interviewer then asked several standardized probe questions to help the participant elaborate on the emotional experiences associated with this event ("Can you explain why this event made