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Explicit self-esteem mediates the relationship between implicit self-esteem and memory biases in major depression

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ABSTRACT

This study examines the relationships between explicit and implicit self-esteem and self-referent memory biases in depression. We specifically tested the hypothesis that implicit self-esteem would influence depression-related memory biases via its association with explicit self-esteem. Self-esteem was assessed in patients with a current Major Depressive Disorder (MDD; n=38) and in a control group of participants who had never experienced depression (ND; n=40) by using explicit (Rosenberg Self-esteem Questionnaire) and implicit (Go/No-go Association Task) measures. A self-referent processing task of negative and positive adjectives was used to assess memory bias. Our analyses revealed that participants diagnosed with MDD showed lower levels of both explicit and implicit self-esteem in comparison to ND participants. MDD compared to ND participants also recalled a greater number of depressed self-referent adjectives and lower recall of positive self-referent information. Mediation analyses showed an indirect effect of explicit self-esteem on the relationship between implicit self-esteem and depression-related memory biases in the MDD group. These findings suggest an association between implicit and explicit self-esteem in depression that may result in negative cognitive processing, as reflected by self-referent memory biases.

1. Introduction

Cognitive models of depression (Beck, 1967; Teasdale, 1988) posit that depressed mood states are maintained by biases in the processing of emotional information. Beck's (1967) model postulates that memory representations, or schemas, lead individuals to select and remember information congruent with those schemas. According to Beck, depressed people's schemas include self-evaluations of loss, separation, failure, worthlessness, and rejection. Consequently, the model predicts that depressed individuals will attend and remember information relevant to and congruent with those self-evaluations.

Most of research examining biases in information processing in depression has focused in the study of memory biases. Memory bias refers to a biased process of retrieval, consisting on either an enhancement or impairment in the recall of a given type of memories. In the context of depression, this bias is referred to a higher propensity to retrieve more negative memories. This bias has been typically assessed using incidental-recall tasks, where it is examined the extent to which depressed individuals remember recently presented negative stimuli in comparison to positive or neutral stimuli. Research using this approach has shown the presence of this negative bias in depression, also showing that its magnitude is even stronger when depressed individuals must specifically recall negative self-referent stimuli (for a review, see Wisco, 2009). Furthermore, previous research has consistently found that depressed compared to non-depressed individuals show not only greater retrieval of negative self-referent material, but also lower retrieval of positive self-referent material (Matt et al., 1992; Gotlib and Joormann, 2010). However, the specific mechanisms by which hypothesized self-evaluations comprising depressive schemas may contribute to the occurrence of these self-referent memory biases still remain unclear.

Self-evaluations for depression have traditionally been measured with questionnaires which measure self-attitudes and self-esteem. Participants are asked to rate statements related to their perceptions about themselves (Ingram et al., 1998). Research has consistently found that depressed individuals report lower levels of global self-esteem, with a lower endorsement of positive qualities and a higher endorsement of negative qualities about themselves compared to non-depressed (e.g., Miranda et al., 1990; Metalsky et al., 1993; Vazquez et al., 2008; Sowislo and Orth, 2013). However, cognitive models postulate that self-evaluations

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are not always consciously accessible (Young, 1994). In this case, schemas would be composed by both implicit and explicit self-evaluations, which would reflect distinct constructs requiring different measurement strategies (Bosson et al., 2000). Current paradigms have been developed to measure self-evaluations indirectly (Phillips et al., 2010), relying on reaction time to evaluate implicit associations between emotional stimuli and self-concepts. Implicit self-esteem measures, as opposed to explicit self-esteem measures, are supposed to capture implicit attitudes toward the self (i.e., valenced association that a person has toward himself or herself), providing an index of self-evaluations while participants may not be aware that they are being measured, and do not have control over the measurement outcome (De Houwer, 2006).

In contrast to studies evaluating explicit self-esteem in depression, which have consistently found evidence of low explicit self-esteem, studies evaluating implicit self-esteem have reported mixed results (for a review see Phillips et al., 2010). For instance, some authors have shown that, depressed individuals are slower in naming colors for self-descriptive negative targets than for negative non-self-descriptive phrases or positive self-descriptive phrases when using a colour-naming Stroop task, which would suggest that they have a faster activation of negative self-referent information (e.g. Segal and Vella, 1990; Segal et al., 1995). In contrast, other studies using different approaches, such as the Implicit Association Test (IAT, Greenwald and Farnham, 2000) and the Go/No-go Association Task (GNAT; Nosek and Banaji, 2001) have found mixed support for the presence of low implicit self-esteem in depressed compared to non-depressed individuals (e.g. De Raedt et al., 2006; Kesting et al., 2011; Valiente et al., 2011). Despite such inconsistencies, some previous studies have shown that both implicit and explicit self-evaluations may be involved in vulnerability towards depression (see Beevers, 2005; Phillips et al., 2012). For instance, both implicit and explicit self-esteem measures have been found to predict depressive reactions to a lab stressor (Haeffel et al., 2007), as well as self-reported levels of daily negative affect (Conner and Barrett, 2005).

Previous research has provided support for an association between both implicit and explicit self-esteem and the presence of self-referent memory biases in the development and maintenance of depressed mood states (Beck, 1967; Teasdale, 1988). First, several studies with non-depressed samples have found that explicit self-esteem levels facilitate the retrieval of consistent information with one's self-evaluation (Story, 1998; Taforady et al., 2003). Taforady et al. (2003) found that individuals with low levels of explicit self-esteem showed better memory for negative information and poorer memory for positive information compared to individuals with high levels of explicit self-esteem. Furthermore, Direnfeld and Roberts (2006) found significant associations between explicit self-evaluations (i.e., dysfunctional attitudes, self-esteem) and incidental retrieval of negative self-referent information in a subclinical sample composed of both non-dysphoric and dysphoric undergraduates. More recently, Romero et al. (2014) found that negative self-evaluations evaluated at both implicit (i.e., with the lexical decision task) and explicit levels (i.e., with the scrambled sentence task) were linked to memory biases for negative self-referent information. Specifically, Romero et al. (2014) found that formerly depressed individuals reported higher recall of negative information and less recall of positive self-referent information compared to never-depressed individuals, and that such differences in memory biases were predicted by group differences in both implicit and explicit self-evaluations.

Dual-process models have been proposed to explain the mechanisms by which these implicit and explicit self-evaluations contribute to depression (Beevers, 2005; Haeffel et al., 2007), based on dual-process theories from social psychology (for recent models see Evans, 2008; Gawronski and Bodenhausen, 2011). According to these models, implicit self-evaluations would result from pre-existing associations in memory and the set of stimuli in the context (e.g., a negative event). Affective reactions as the result of a given implicit association (e.g., "me" "bad") would be, in turn, translated into the format of a propositional statement (e.g., negative reaction → "I am bad"). Beevers (2005) argues that the primary role of explicit cognitive processes is to evaluate and alter such implicit self-evaluations. In his model, negative implicit self-evaluations are the primary source of cognitive vulnerability to depression, being dominant under conditions where they are uncorrected. Therefore, the more that negative implicit self-evaluations are uncorrected by explicit processes, the more they lead to depression-related cognitive biases and sustained negative affect.

In contrast, Haeffel et al. (2007) argue that explicit rather than implicit self-evaluations are the primary source of cognitive vulnerability to depression. Individuals' final evaluations may depend on whether they use explicit processes to accept or change initial implicit self-evaluations, but in last term explicit self-evaluations would be the sole factor having an impact on depression. Implicit negative self-evaluations that remain uncorrected by explicit processes might be endorsed into congruent explicit self-evaluations (e.g., "I do not like myself"), which, in turn, would be the ones guiding cognitive processing in a congruent manner (i.e., depression-related cognitive biases), leading to sustained negative affective conditions.

Some studies have initially tested implicit and explicit self-evaluations of depression, providing relatively stronger support to Haeffel et al's prediction. First, although some studies have reported correlations between the IAT self-evaluation and depression scores (e.g., Buhlmann et al., 2008; De Raedt et al., 2008), overall, there has not been sufficient support for a link between the IAT and depression measure (overall $r = -.14$). However, there is strong support for a link between explicit self-esteem and depression (overall $r = -.64$; in Buhrmester et al., 2011). Second, several longitudinal studies have found that IAT self-evaluations do not predict future depressive symptoms (Bos et al., 2010; Kruijt et al., 2013) whereas explicit self-esteem has been found to significantly account for depressive symptom changes (Bos et al., 2010). Furthermore, in their study, Haeffel et al. (2007) reported that both implicit and explicit self-esteem interacted with life stress to predict prospective changes in depressive symptoms. However, when both implicit and explicit predictors were entered into a regression equation simultaneously, only the explicit measure interacted with stress to remain a unique predictor of depressive symptoms over the five-week prospective interval (see also van Tuijl et al., 2014). On the other hand, other studies have also shown that implicit, rather than explicit self-esteem has a larger role in predicting long-term depressive symptoms (e.g., Franck et al., 2007) and, therefore, further research is needed to clarify this.

While studies derived from dual-process models were initially aimed at clarifying the contribution of both implicit and explicit self-evaluations to the onset of depression, further research is needed to understand how these different forms of self-evaluation interact once an individual has already developed depression. Therefore, it seems necessary to clarify the contribution of implicit and explicit evaluations to mechanisms of depression maintenance, which would help to identify the appropriate targets for intervention. Interestingly, memory biases for self-referent information, among others biased cognitive processes during depressive episodes, have been identified as significant markers of depression maintenance and sustained negative affect (Gotlib and Joormann, 2010). However, the specific mechanisms by which implicit and explicit self-evaluations may contribute to the occurrence of depression-related memory biases in clinically depressed participants remains unclear, as the associations of