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Implicit measurement of positive and negative future thinking as a predictor of depressive symptoms and hopelessness

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ABSTRACT

Research using explicit measures has linked decreased positive future thinking, but not increased negative future thinking, with clinical depression. However, individuals may be unable or unwilling to express thoughts about the future, and can be unaware of implicit beliefs that can influence their behavior. Implicit measures of cognition may shed light on the role of future thinking in depression. To our knowledge, the current study presents the first implicit measure of positive and negative future thinking. A sample of 71 volunteers (38 healthy; 33 with sub-clinical depression) completed both implicit and explicit measures of positive and negative future thinking. The findings indicate differences in the evaluation of both positive and negative future events between the two groups. However, group differences were more pronounced on the implicit measure. These findings point to the potential utility of an implicit measure of future thinking in mental health research and clinical practice.

1. Introduction

Thinking about the future is a core and distinguishing feature of human cognition. Previous research links altered future thinking with conditions such as depression and anxiety (MacLeod, Pankhania, Lee, & Mitchell, 1997; MacLeod, Rose, & Williams, 1993). One well-established method of future thinking assessment is the Future Thinking Task (FTT; MacLeod, Pankhania, Lee, & Mitchell, 1997; MacLeod et al., 1993). According to studies employing the FTT, depressed or anxious individuals differ from their healthy counterparts in their ability to generate positive and negative future expectancies. Specifically, depressed individuals demonstrate lower positive, but similar negative, expectancies compared with healthy individuals (i.e. MacLeod, Tata, Kentish & Jacobsen, 1997). Meanwhile, anxious individuals show higher negative, but not lower positive, future expectancies. There is also a burgeoning literature on links between future thinking and suicidality (cf. Szpunar, 2010). This work is exciting given the potential clinical utility of an assessment that allows early detection of suicidal ideation.

Individuals with comorbid anxiety and depression demonstrate higher negative expectancies and lower positive expectancies (MacLeod & Byrne, 1996). Until recently, intervention and assessment of future expectancies in participants with

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comorbid anxiety and depression have aimed to either increase positive future thinking based on depression research, or alleviate negative future thinking based on anxiety disorder research. However, neither of these approaches specifically target future expectancies associated with comorbid anxiety and depressive disorders (Brown, Schulberg, Madonia, et al., 1996; Kessler, Stang, Wittchen, et al., 1998; Sherbourne, Wells, Meredith, et al., 1996; Coryell et al., 1998). Given the fact that those diagnosed with comorbid anxiety and depression have a greater risk of suicide-related behaviors and completed suicide (Angst, Angst, & Stassen, 1999; Lepine, Chignon, & Teherani, 1993; Roy-Byrne, Stang, Wittchen, et al., 2000; Sareen et al., 2005; TenHave et al., 2009) than those with either depression or anxiety alone it is important to have an understanding of future expectancies in comordid patients. Thus, gaining a better understanding of distinctive future thinking patterns characterized by comorbid depression and anxiety is acutely important.

The Future Thinking Task (FTT) was designed to specifically target valence differences in individuals' cognitions about the future (MacLeod et al., 1993, 1997). Initial findings with the FTT indicated that positive and negative cognitions concerning the future represent two separate aspects of experience (e.g. MacLeod, Byrne, & Valentine, 1996), and other work indicates that generalized positive and negative future expectancies are differentially associated with biological outcomes (e.g., O'Donovan et al., 2009; Sharot, Riccardi, Raio, & Phelps, 2007). Whereas reduced generation of positive future events has been linked with depression and suicidal ideation, increased generation of negative future events has been linked with anxiety (e.g. Conaghan & Davidson, 2002; Hunter & O'Connor, 2003; MacLeod et al., 1997). However, studies examining estimates of negative future event likelihood have been mixed in clinical and non-clinical samples have been mixed. In some studies, individuals with dysphoric mood, rated negative future events as more likely compared to controls (depressed patients, Butler & Mathews, 1983; MacLeod et al., 1997; dysphoric students, Andersen, Spielman, & Bargh, 1992; Pietromonaco & Markus, 1985). However, other studies did report lower generation of positive future events in depression (depressed patients, MacLeod & Cropley, 1995; Pyszczynski & Greenberg, 1987; dysphoric students, Andersen, Spielman, & Bargh, 1992).

Administering the FTT involves explicitly asking participants to generate a number of potential events for the future (i.e., positive events that the individual is 'looking forward to' and negative events that the individual is 'not looking forward to') over different time periods in the future (i.e. the next week, the following year and the subsequent five to ten years). The explicit nature of the task renders it easy to administer, however, the direct questioning style of the task leaves it prone to weaknesses inherent to explicit measures (Gannon, 2006; Roche, Ruiz, O'Riordan & Hand, 2005). For example, it has been found that self-report measures are affected by factors such as the immediate mood of the respondent and their physical surroundings (Schwarz & Clore, 1983; Schwarz & Strack, 1991)(Hepburn, Barnhofer, & Williams, 2006). Despite efforts to increase the validity of explicit self-report measures, such as controlling for these tendencies by using social desirability scales (Paulhus, 1988), only limited progress has been made in this direction (Holden, Book, Edwards, Wasylkiw, & Starzyk, 2003; Roefs et al., 2011). This is of particular concern in clinical research because the thoughts and beliefs people tend to conceal on such measures may reflect the cognitions they attempt to conceal from themselves too (Greenwald et al., 2002). In the long term, any level of suppression (experiential avoidance) may lead to the adoption of unhealthy coping strategies that may accumulate and reinforce negative thoughts about the self and the future (Hayes, 1994; Hayes, Barnes-Holmes, & Roche, 2001).

Implicit measures show much promise in comparison to explicit measures (see Roef's et al., 2011 for a review). Greenwald and Banaji (1995, p. 8) define implicit attitudes as '*introspective occurrences of past experience that facilitate evaluative feelings, thoughts, or actions toward ones social world*'. Thus, implicit measures not only aim to overcome tendencies to respond in a socially desirable manner, but also target 'automatic' beliefs and responses outside of conscious control (e.g., Barnes-Holmes et al., 2006; De Houwer, 2002; Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Greenwald, McGhee, & Schwartz, 1998; Nosek & Banaji, 2001; Roefs et al., 2011). One study by Egloff and Schmukle (2002) demonstrated low or no correlation between explicit and implicit anxiety measures. However, the implicit anxiety measure did predict several behavioral measures of anxiety during a stressful speech task. Roefs et al. (2011) in a review of implicit measures has noted that 'the possible independence from overt reports has made them highly attractive' (p.186) for the study of depression and a variety of other psychiatric conditions. The core postulate behind implicit measures suggests that individuals are often unaware of the implicit beliefs that can subsequently influence their behavior.

The Implicit Association Task (IAT; Greenwald et al., 1998) is one of the more commonly used implicit measures. The IAT was designed to examine non-conscious differential associations of two target concepts with an attribute across individuals (Olson & Fazio, 2001). In a typical IAT, participants are required to pair two target concepts with a particular attribute. Faster reaction times and improved accuracy are generally reported when associated concepts are assigned to the same response (e.g., young- beautiful as opposed to when associated responses are assigned to different responses (e.g., old-beautiful) (Greenwald et al., 1998). The IAT protocol is based on the simple assumption that a person's response should be faster when associating items that they would pair together such as 'young' and 'beautiful' than when associating items that they would not pair together such as 'old' and 'beautiful' (Nosek & Hansen, 2008). The IAT effect has been depicted by the latency variance between trials that pair congruent stimuli and trials that pair non-congruent stimuli. Thus, the IAT is very useful in measuring stimuli that we categorize together or apart from each other.

Despite its widespread use and applicability for examining individuals pre-experimental associations, the IAT paradigm may be limited in that it only allows the measurement of associations between categories. Specifically, such measurement of associations does not provide information about the nature or direction of the association (Barnes-Holmes et al., 2006) rendering the IAT procedure inadequate for distinguishing between positive and negative future thinking. Recent research