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Seeing light at the end of the tunnel: Positive prospective mental imagery and optimism in depression

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ABSTRACT

Optimism is associated with positive outcomes across many health domains, from cardiovascular disease to depression. However, we know little about cognitive processes underlying optimism in psychopathology. The present study tested whether the ability to vividly imagine positive events in one's future was associated with dispositional optimism in a sample of depressed adults. Cross-sectional and longitudinal analyses were conducted, using baseline (all participants, *N*=150) and follow-up data (participants in the control condition only, *N*=63) from a clinical trial (Blackwell et al., 2015). Vividness of positive prospective imagery, assessed on a laboratory-administered task at baseline, was significantly associated with both current optimism levels at baseline and future (seven months later) optimism levels, including when controlling for potential confounds. Even when depressed, those individuals able to envision a brighter future were more optimistic, and regained optimism more quickly over time, than those less able to do so at baseline. Strategies to increase the vividness of positive prospective imagery may aid development of mental health interventions to boost optimism.

1. Introduction

A neglected area in psychopathology research concerns optimism and the ability to imagine a more positive future - something that may be of particular relevance to depression (Holmes et al., 2016). Most people are staunch “optimists”, expecting good rather than bad things to happen to themselves in the future (Weinstein, 1980). Defined as the generalized tendency to expect the future to turn out well, dispositional optimism is a robust predictor of psychological and physical wellbeing (Carver and Scheier, 2014; Carver et al., 2010). For example, people who are more optimistic are less likely to develop depressive symptoms (Giltay et al., 2006), and they recover from depression more quickly (Kronström et al., 2011). Given such findings, it is unsurprising that optimism has been the subject of extensive research – understanding its basis could not only illuminate important aspects of resilience, but also inform development of interventions to harness its beneficial effects. Numerous factors such as genetics (Bates, 2015; Plomin et al., 1992), life events (Broekhof et al., 2015), and socio-economic status (Heinonen et al., 2006) have been identified as contributing to whether an individual tends to be optimistic or otherwise. From a clinical perspective, cognitive processes involved in optimism may be particularly important to understand, as these could provide modifiable targets for psychological interventions.

Dispositional optimism is defined in terms of expectancies for the future, thus cognitive components of future-oriented thinking provide a useful focus for investigation. One important way in which people think about the future is via simulations of possible events using mental imagery (Schacter et al., 2008, 2012). Mental imagery refers to internal representations of perceptual experience without external sensory input, commonly described as “seeing with the mind's eye”, “hearing with the mind's ear”, and so on (Kosslyn et al., 2001; Pearson et al., 2015). Theoretical accounts suggest that people may use the experience of simulating events, such as via mental imagery, as information to help evaluate and predict the future (e.g. Kahneman and Tversky, 1982; Szpunar and Schacter, 2013). Could differences in individuals' expectancies about the future, that is, how optimistic or pessimistic they are, be related to how easily they can imagine different future possibilities? Depression is characterized by pessimistic expectancies for the future (e.g. Alloy and Ahrens, 1987; Beck et al., 1979; Miranda and Mennin, 2007), and emerging evidence suggests that people with depressed mood (Anderson and Evans, 2014; Holmes et al., 2008; Szőllősi et al., 2015) or major depressive disorder (Morina et al., 2011), struggle to generate images of positive events in their future. Specifically, they generate less vivid positive prospective mental images than non-

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depressed individuals. Conversely, initial research suggests that people who are optimistic can imagine positive events in their future particularly vividly (Blackwell et al., 2013).

Blackwell et al. (2013) examined the relationship between prospective mental imagery and optimism, using a cross-sectional design in a community sample (*N*=237). Higher levels of dispositional optimism, as measured via the Life Orientation Test – Revised (LOT-R; Scheier et al., 1994), were associated with higher subjective vividness of mental imagery for positive future scenarios (on the Prospective Imagery Task; PIT; Stöber, 2000), even when controlling for socio-demographic factors, health, general everyday mental imagery use, and vividness for negative future scenarios. This suggests the possibility that how vividly someone can imagine positive events in their future may be related to how optimistic they feel. This idea has intuitive appeal, to the extent that it may even appear tautological. However, the constructs measured are distinct: vividness as measured by the PIT is the perceived visual quality (clarity) of specific mental images generated, whereas dispositional optimism as measured by the LOT-R reflects the judgments one generally makes about one's own future, and makes no reference to imagery or imagined future events. A link between the quality of an individual's mental imagery and their generalized future expectancies is therefore interesting both from a theoretical perspective, contributing to our understanding of the role of imagery-based simulation in prospective thinking, and from a clinical perspective, highlighting a potential target for novel interventions. However, research in this area is preliminary, and many key questions remain.

The current study aimed to replicate the findings of Blackwell et al. (2013) and extend them in three main ways, using a sample of 150 depressed individuals from a clinical trial (Blackwell et al., 2015). First, we aimed to test whether the previously observed relationship between positive prospective imagery vividness and optimism also holds in a depressed sample. Baseline data from the trial (pre-intervention; *N*=150) allowed us to test the hypothesis that, amongst people with current major depression, higher vividness ratings for mental imagery of positive future scenarios (PIT) would be associated with higher optimism (LOT-R) when controlling for socio-demographic variables, health, general everyday mental imagery use, and negative imagery vividness. This provides a direct replication (Schmidt, 2009) of Blackwell et al. (2013), extended to a depressed sample.

Second, we aimed to rule out the possibility that the relationship between positive prospective imagery vividness and optimism would simply be a reflection of these measures' shared variance with relevant, but previously unmeasured variables, such as depression, anxiety, or the negative cognitive biases with which these are associated. The trial data included measures of depression symptoms, trait anxiety, and interpretation bias, and thus we were able to test the hypothesis that a unique relationship between positive prospective imagery vividness and optimism would hold even when controlling for these additional related factors.

Third, we aimed to extend the previous cross-sectional research and probe *temporal* relationships between processes, a crucial step for addressing questions relating to mechanisms (Kraemer et al., 1997). The trial included longitudinal data, enabling us to investigate optimism over a seven-month period, using data from participants in the trial's control condition (*N*=63). We predicted that higher baseline positive prospective imagery vividness (PIT) would be associated with greater optimism seven months later (as indicated by higher scores on the LOT-R), even when controlling for baseline optimism scores and other relevant variables (cf. Kleim et al., 2014; Nelis et al., 2015).

2. Method

2.1. Participants

Participants were 150 depressed adults (103 female) recruited for a clinical trial (trial data reported in Blackwell et al., 2015; registered at clinicaltrials.gov, NCT01443234). Participants were recruited via advertisements in local media (newspapers and radio), web sites (e.g. Google, Facebook), and community (e.g. public library), university, and health settings (e.g. GP practices) in the local area. Advertisements had taglines such as "Feeling Blue? We need your help!" and included the information that the study involved completing an "online computer program" over a four-week period. People who responded to the advertisements by contacting the research team were emailed an information sheet about the study, and those interested in participating then completed screening questionnaires online. Potentially eligible participants (scoring 14 or above on the Beck Depression Inventory – II; BDI-II; Beck et al., 1996; i.e. the cut-off for mild depression) were invited for a face-to-face eligibility assessment. Five months into the trial, an additional brief structured telephone-screening interview was added prior to the face-to-face assessment to screen out participants obviously meeting exclusion criteria (e.g. currently receiving psychological therapy, see Blackwell et al., 2015). Inclusion criteria were: willing and able to give consent to the study, male or female aged between 18–65; fluent in written and spoken English; access to the internet in order to complete the online program (for the trial intervention); able to travel to the research center for assessment appointments; and meeting Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; American Psychiatric Association, 2000) criteria for a current major depressive episode assessed via semi-structured clinical interview (the Structured Clinical Interview for DSM–IV–TR Axis I Disorders, SCID; First et al., 2002). Exclusion criteria were: current psychological therapy; participation in concurrent treatment trials; current psychotic or substance-abuse disorder; history of mania/hypomania; or dosage change of antidepressant medication during the past month. Ethical approval was provided by the NRES Committee South Central - Oxford C (11/SC/0278).

Participants ranged in age from 18 to 65 years (*M*=35.49, *SD*=14.05), with 94.7% reporting their ethnicity as "White", and 56.7% in paid employment, 28.0% student, 9.3% unemployed, 3.3% full-time homemaker or carer, and 2.7% retired.

2.2. Measures

2.2.1. Prospective mental imagery vividness

Was assessed with the Prospective Imagery Task (PIT; Holmes et al., 2008; Stöber, 2000), a brief paper-based self-report measure. Participants read descriptions of 10 positive (e.g. *"People you meet will like you"*) and 10 negative (*"You will be the victim of crime"*) hypothetical future events and were asked to imagine each as if happening to them in the near future. Participants rated the subjective vividness of each of their images on a five-point scale, ranging from 1 (*no image at all*) to 5 (*very vivid*). Main predictions concern vividness ratings for the positive items, and negative items were included to control for general ability to generate future imagery (Blackwell et al., 2013). The mean of the vividness ratings for the relevant items is used as the 'score' for each subscale (positive or negative), and thus scores can range from 1 to 5, with a higher score indicating more vivid imagery.

The PIT has good internal consistency ($0.83 < \alpha < 0.90$; Blackwell et al., 2013; see also Stöber, 2000). In our depressed sample, internal consistency was good for both positive (α=0.85) and negative (α=0.85) vividness scales.

2.2.2. Optimism

The Life Orientation Test-Revisited (LOT-R; Scheier et al., 1994) is the most widely used measure of trait optimism. It includes three positively-framed statements (e.g. *"In uncertain times, I usually expect the best"*) and three reverse-scored negatively-framed statements (e.g. *"If something can go wrong for me, it will"*) rated on a 5-point scale from 0 (*strongly disagree*) to 4 (*strongly agree*). An additional four