



Fishing for happiness: The effects of generating positive imagery on mood and behaviour

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ABSTRACT

Experimental evidence using picture–word cues has shown that generating mental imagery has a causal impact on emotion, at least for images prompted by negative or benign stimuli. It remains unclear whether this finding extends to overtly positive stimuli and whether generating positive imagery can increase positive affect in people with dysphoria. Dysphoric participants were assigned to one of three conditions, and given instructions to generate mental images in response to picture–word cues which were either positive, negative or mixed (control) in valence. Results showed that the positive picture–word condition increased positive affect more than the control and negative conditions. Participants in the positive condition also demonstrated enhanced performance on a behavioural task compared to the two other conditions. Compared to participants in the negative condition, participants in the positive condition provided more positive responses on a homophone task administered after 24 h to assess the durability of effects. These findings suggest that a positive picture–word task used to evoke mental imagery leads to improvements in positive mood, with transfer to later performance. Understanding the mechanisms underlying mood change in dysphoria may hold implications for both theory and treatment development.

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Can we engage imagination to promote more positive mood? Recent evidence using picture–word cues suggests that evoking mental imagery has a more powerful impact on emotion than using verbal language (Holmes, Mathews, Mackintosh, & Dalgleish, 2008), at least for negative and benign stimuli. This is consistent with a line of research suggesting that mental imagery has a special impact on emotion (Arntz, de Groot, & Kindt, 2005; Holmes & Mathews, 2005, 2010; Holmes, Mathews, Dalgleish, & Mackintosh, 2006). However, the impact of generating mental imagery from overtly positive picture–word stimuli remains to be explored. We know little about the promotion of overtly positive imagery, particularly when this is most needed as in depressed mood. While the research is part of a broader endeavour to improve depressed mood, in this study we focused on the extent to which positive affect (rather than depressed mood per se) improved as a result of generating positive imagery. Our focus on positive affect and imagery was driven by recent findings that depression is not just associated with an excess of negative cognitions and affect, but also a deficit in positive cognitions (Holmes, Lang, Moulds, & Steele, 2008; Joorman, Siemer,

& Gotlib, 2007; MacLeod & Byrne, 1996), positive affect (Watson, Clark, & Carey, 1988) and willingness to pursue potentially rewarding goals (Dickson, Moberly, & Kinderman, 2011).

Research suggests that individuals with depression fail to benefit from the emotional lift provided by evoking past and future positive personal events (Joorman et al., 2007; Joormann & Siemer, 2004). Several mechanisms may contribute to this effect. With respect to mental imagery, this lack of congruent emotional response might be explained by three characteristic features of depressive thinking. First, depression has been shown to be associated with a deficit in generating positive imagery about the future (Holmes, Lang, et al., 2008; Stöber, 2000; Williams et al., 1996). Second, depression is characterized by rumination which is predominantly verbal in nature (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002). The verbal processing of positive information can have the paradoxical effect of worsening mood rather than improving it (Holmes, Lang, & Shah, 2009). Finally, depressed individuals tend to recall positive autobiographical events from an observer rather than a field perspective (Lemogne et al., 2006). Imagining positive scenarios from an observer perspective has been shown to lower mood, possibly due to unfavourable comparisons with perceived reality (Holmes, Coughtrey, & Connor, 2008). For all these reasons, we have suggested the utility of promoting positive future-oriented, field

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perspective mental imagery for improving depressed mood (Blackwell & Holmes, 2010; Holmes, Lang, & Shah, 2009).

The benefit of generating images about positive future outcomes may not be limited to mood and cognitive bias improvement but extend to subsequent behaviour. Indeed, a body of evidence suggests that imagining one's own future behaviour can increase the likelihood of that behaviour being enacted in reality (Carroll, 1978; Gregory, Cialdini, & Carpenter, 1982; Pham & Taylor, 1999). Imagining a possible event outcome has been shown to increase subjective probability that the same outcome will actually occur (Carroll, 1978). Depressed individuals' attitudes towards the future is marked with reduced expectancies for positive events (MacLeod, Rose, & Williams, 1993; Pyszczynski & Greenberg, 1987) and a lack of approach motivation towards future goals (Dickson & MacLeod, 2004). Moreover, a clinical feature of depression is a lack of interest in almost all everyday activities that were previously perceived as rewarding and enjoyable (American Psychiatric Association, 2000). Consequently, individuals with depression are less persistent and tend to engage less time in goal-directed behaviours than do healthy individuals (Hopko, Armento, Cantu, Chambers, & Lejuez, 2003; Hopko & Mullane, 2008).

Previous studies of dysphoric and depressed individuals have shown that, although these groups are as able as non-dysphoric groups to identify desirable activities and goals, they are more pessimistic about the outcome of any attempts to achieve these goals (Dickson et al., 2011). Similarly, when actually required to attempt experimental tasks, dysphoric individuals (and those exposed to learned helplessness inductions) are more readily discouraged by anticipated loss, are more inclined to give up trying after failures, and are less encouraged by expected rewards, resulting in poorer performance when effort is required to achieve success (Henriques, Glowacki, & Davidson, 1994; Miller & Seligman, 1975; Pizzagalli, Iosifescu, Hallett, Ratner, & Fava, 2008). On the basis of these results, we predicted that the performance of dysphoric participants would be improved by positive imagery designed to increase the anticipation of success under ambiguous conditions, thus enhancing their effortful engagement in a difficult but potentially rewarding task. A fishing game task (as in Reinecke, Deeproose, & Holmes, submitted for publication) was chosen as a simple behavioural performance measure assumed to tap behaviour negatively associated with dysphoria, such as approach motivation and persistence, while being clearly different in nature from the picture–word task.

Exploring the transfer of positive mental imagery to behaviour is of both clinical and theoretical relevance (Kavanagh, Andrade, & May, 2005). The deficit in motivated behaviour is one of the most pernicious symptoms in depression because it cuts the individual off from pleasant and rewarding experiences. This behavioural component of depression has long been targeted in Cognitive Behavioural Therapy (CBT) and has also given rise to the development of successful interventions known as “behavioural activation” (Jacobson, Martell, & Dimidjian, 2001). The aim of behavioural activation is to increase the likelihood of engaging in rewarding behaviours. Therefore, the clinical relevance of using an experimental task designed to encourage positive mental imagery to alleviate depressed mood would be further supported if a behaviour-enhancing effect followed training.

In the current experiment, dysphoric participants were given training and instructions to evoke mental imagery in line with our previous work on mental imagery generation (Holmes, Mathews, et al., 2008). Participants were then asked to imagine and rate the vividness of imagery in response to viewing 200 picture–word combinations within one of three conditions: positive resolution, negative resolution or a mixed control condition, before completing the behavioural task. To assess the durability of effects, a measure based on the perceived meaning of emotionally

ambiguous homophones (Mathews, Richards, & Eysenck, 1989) was completed 24 h later.

Our predictions were that, compared to the control condition, the positive condition would lead to a greater increase in positive mood. Conversely, we predicted that compared to control condition, the negative condition would lead to a greater decrease in positive mood. Furthermore, we predicted that generating mental images in response to picture–word cues would impact on later behaviour, with participants in the positive condition performing better on the fishing task than those in the control and negative conditions. Finally, we predicted a similar pattern of results on the homophone test completed 24 h later.

Method

Participants

Eighty-seven individuals (50 women; mean age = 27.96, $SD = 11.33$) with scores in the dysphoric range on the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) were recruited via advertisements in the local University town. When defining dysphoric samples it is generally recommended to use a multistage process (Kendall, Hollon, Beck, Hammen, & Ingram, 1987; Wenzlaff & Bates, 1998) to ensure that negative mood is not merely elevated at the start of the experimental session. In this study we defined dysphoric mood as a BDI-II (BDI-II; Beck, Steer, & Brown, 1996) score of 10 or above, at two time points, separated by at least 5 days, following Aarts, Wegner, and Dijksterhuis (2006), Dalgleish and Yiend (2006) and Sedek and von Hecker (2004). Thus, of the 87 participants meeting criteria at recruitment, 81 still met criteria at the beginning of the experimental session and were included in the study. The 6 people that no longer had a BDI-II score of 10 or above at the beginning of the experimental session ($M = 8.00$, $SD = 1.55$) did not differ from the sample in terms of age, $t(85) = 1.06$, $p = .29$, or gender $\chi^2(2, N = 87) = 3.57$, $p = .60$. The mean BDI-II score for the final sample of 81 participants was 17.63 ($SD = 7.56$) at recruitment, and 16.52 ($SD = 7.21$) at the beginning of the experimental session (henceforth referred to as time 1 in Table 1).

Materials

Picture–word cues to generate mental images

Participants were required to generate mental images in response to picture–word cues as in earlier research (Holmes,

Table 1
Characteristics of participants at baseline per condition.

Characteristic	Positive ($n = 27$)		Negative ($n = 27$)		Control ($n = 27$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (years)	29.78	12.37	28	12	26	9.50
Gender (%)						
Female	59		67		59	
Male	41		33		41	
BDI-II						
At recruitment	18.15	7.96	17.00	6.98	17.74	7.94
At baseline (time 1)	16.67	6.85	16.30	7.14	16.59	7.87
BHS	6.04	4.59	6.00	5.43	6.89	5.10
STAI-T	46.33	11.23	46.41	11.93	48.96	10.38
SUIS	41.15	6.52	38.63	8.39	39.85	9.10

Note: BDI-II = Beck Depression Inventory-II, BHS = Beck Hopelessness, STAI = Spielberger State-Trait Anxiety Inventory, SUIS = Spontaneous Use of Imagery Scale, PANAS = total positive affect score from the PANAS.

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