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Mood repair in healthy individuals: Both processing mode and imagery content matter

Laura Seebauer [a, *], Tobias Arthen [b], Marit Austermann [b], Johannes Falck [b], Lennart Koch [b], Michelle L. Moulds [c], Gitta A. Jacob [b, d]

[a] Biological and Personality Psychology, University of Freiburg, Germany
[b] Clinical Psychology and Psychotherapy, University of Freiburg, Germany
[c] School of Psychology, The University of New South Wales, Sydney, Australia
[d] GAIA AG, Hamburg, Germany

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ABSTRACT

Background: The recall of positive autobiographical memories (mood repair) is an effective strategy for improving sad mood. In depressed individuals mood repair has shown to be most effective, if the memory was processed in a concrete (imaginable), as opposed to an abstract (verbal) processing mode. However, it is not yet clear whether this also applies to healthy subjects. Moreover we do not know whether intensity and content of an imagery stimulus influences its effectiveness. We report on two experimental studies in healthy participants.
Methods: Negative emotion induction was followed by mood repair via recall of positive autobiographical memories. In study I, abstract processing was compared to two concrete processing strategies (high concrete/low concrete). In study II, the content of the memories was systematically varied (social/achievement).
Results: In study I, a concrete processing resulted in better mood repair, however no differences were found between high and low concrete processing. In study II, both types of memories had comparable effects on mood repair but promoted different emotions.
Limitations: Only a young, healthy, predominantly female population was investigated.
Conclusions: Adopting a concrete processing mode when recalling positive memories leads to better mood repair in healthy participants. Moreover, the content of the memory determines the corresponding emotions.

1. Introduction

Negative affect, which is at the core of many mental disorders, is often associated with distressing mental images (Holmes & Mathews, 2010). Accordingly, imagery techniques are increasingly applied to reduce negative emotions or boost positive emotions (Hackmann, Bennett-Levy, & Holmes, 2011).

A rather simple and effective imagery technique is the so-called *mood-repair* via recall of positive autobiographical memories (Joormann & Siemer, 2004; Joormann, Siemer, & Gotlib, 2007). Retrieving specific positive memories after a sadness induction was shown to induce positive mood and "repair" the sadness in healthy people, but not in formerly depressed or acutely depressed participants (Joormann et al., 2007). In a follow-up study investigating this group difference Werner-Seidler and Moulds (2012) found that mode of processing determined the emotional consequences of happy memory recall in depressed individuals. Those in a concrete processing mode (moment by moment reliving, focussing on details etc.) experienced effective mood repair, while participants in an abstract processing mode (analytical approach, focus on causes, meanings and consequences etc.) did not experience any improvement of mood – possibly because abstract processing is associated with a ruminative comparison between the happy memory and the current depressive experience (Werner-Seidler & Moulds, 2012).

Accordingly research in mental imagery shows that imagining positive events improves mood more than verbal processing

* Corresponding author. Department Biological and Personality Psychology, University of Freiburg, Stefan-Meier-Str.8, D-79106 Freiburg, Germany.
E-mail address: laura.seebauer@psychologie.uni-freiburg.de (L. Seebauer).

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(Holmes, Lang, & Shah, 2009). Furthermore, evidence is growing that imagery techniques which rely on concrete sensory processing are most effective in psychotherapy (Arntz, 2011; Hackmann et al., 2011). Clinicians also recommend optimizing the vividness of such exercises e.g. by closing one's eyes, focussing on bodily sensations, imagining details, taking the field perspective and using first-person present tense (Hackmann et al., 2011). However, only some of these instructions have been empirically investigated, and study results are mixed regarding whether or not such instructions do actually improve the effect of these exercises (Berntsen & Rubin, 2006; Holmes, Coughtrey, & Connor, 2008; McIsaac & Eich, 2004; Pearson, Deeprose, Wallace-Hadrill, Burnett Heyes, & Holmes, 2012; Terry & Horton, 2007). Research is needed to test these recommendations, since some patients are hesitant to follow such instructions because they fear to relive distressing images intensely. Finally, while clinical instructions cover formal aspects, i.e. *how* to do those exercises, they specify less about the imagery content, i.e. which images should be processed, when using positive imagery to repair mood.

We conducted two studies to investigate the following three questions: (1) Does processing positive memories in a concrete mode promote better mood repair than processing in the abstract mode in a healthy sample? (Study I); (2) Are participants following clinical instructions on enhancing intensity and are the instructions suitable to increase the positive emotional effect of a mood repair exercise in the concrete processing mode? (Study I); (3) Does the content of the positive memories make a difference with regard to their emotional effect? (Study I & II).

2. Study I

2.1. Methods

2.1.1. Participants

Out of 104 recruited psychology students who participated in the study, $n = 87$ were included in the analysis. $N = 17$ participants were excluded, 11 due to high depression scores (BDI > 14), 6 did not follow the experimental procedure as instructed.

2.1.2. Material and measures

2.1.2.1. Mood induction. One of two film clips (10 min) was used for sadness induction at the beginning of the experiment. Most participants ($n = 78$) watched a segment of the motion picture *The Dead Poets Society* (Weir, 1989). This film segment has been validated to induce negative mood and was used in all forerunner studies (Joormann & Siemer, 2004; Joormann et al., 2007; Werner-Seidler & Moulds, 2012). Due to the age of this movie, we introduced an additional, more recent, movie clip, in case any mood induction effects were specific to the first clip. Therefore $n = 9$ participants watched a segment from the motion picture *Lion King* (Allers & Minkoff, 1994).

2.1.2.2. Mood repair. In the instruction (partly adopted from Werner-Seidler & Moulds, 2012), participants were instructed to recall a positive memory. In order to support focus on the respective processing mode, participants were asked seven specific questions (see appendix) to think about (e.g.: “Who else is present”).

2.1.2.3. Mood ratings. Participants rated their current experience of three emotions (sad, happy, bad) on a nine point scale (1 = not at all, 9 = very much). These items showed good internal consistency in Werner-Seidler and Moulds' study (2012; $.80 \leq \alpha \leq .89$). An overall mood variable (range 3–27, 3 = very bad mood) was calculated from the mood ratings.

2.1.2.4. Questionnaires. BDI-II: The Beck Depression Inventory (BDI) was used to exclude currently depressed participants (cut-off score > 14) (Kühner, Bürger, Keller, & Hautzinger, 2007).

SUIS: The Spontaneous Use of Imagery Scale (*SUIS*; Reisberg, Pearson, & Kosslyn, 2003) was used to control for habitual use of mental imagery.

2.1.2.5. Memory content. The content of the spontaneously selected memory was assessed orally after the experiment and assigned to one of three categories (social, achievement, nature and travelling). $N = 15$ participants did not report this information.

2.1.3. Procedure

The experimental procedure was adapted from Werner-Seidler and Moulds (2012). Sadness induction was followed by either abstract (verbal) or concrete (imagery) positive memory recall. In addition to the conditions employed by Werner-Seidler and Moulds (2012), two different concrete processing modes were compared (high and low concrete). (1) The *abstract processing mode* condition promoted abstract, analytical reflection and verbal, ruminative processing of the event and its consequences (“Why did the event happen?”). (2) In the *low concrete processing mode* condition, participants were instructed to run the memory from an observer perspective like a film in their mind's eye and to focus on external conditions (“What did people talk about?”). (3) The *high concrete processing mode* condition reflecting therapeutic recommendations promoted a highly concrete, image-based reliving of the event with closed eyes, from a field perspective, focussing on sensorial content of the event in the present tense (“What do you see?”). The detailed instructions are found in the appendix.

After giving informed consent, participants filled in one part of the questionnaires and were randomized to one of the three conditions. After negative mood induction, participants received written instructions for the recall of a positive autobiographical memory, which lasted 6 min. Mood ratings were assessed before and after the mood induction and after mood repair. After the experiment participants in the two concrete processing mode conditions rated intensity and vividness of the exercise on a nine point scale (1 = not at all, 9 = very much) as well as their imagery perspective (observer/rather observer/rather field/field). Finally the remaining questionnaires were filled in.

2.1.4. Statistical analysis

Cronbach's α was calculated for the mood ratings (happy, sad, and bad). For the calculation of internal consistency reversed scores for bad and sad were used. Two factorial ANOVA with repeated measures was conducted for the manipulation check of sad mood induction (factors: condition (abstract/high concrete/low concrete); time (t0/t1)). ANCOVA was conducted to compare the mood effect of the two film clips (factor: film (dead poets' society/lion king); dependent variable: t1 mood ratings; covariate: t0 mood ratings). T-tests were used to compare self-rated intensity and vividness in the two concrete conditions. ANCOVA was conducted to compare t2 mood ratings of the two concrete strategies (factor: condition (high concrete/low concrete); covariate: t1 mood ratings).

Pearson's r coefficient was calculated to investigate the connection between self-rated intensity and mood repair (t2 minus t1 mood ratings). We conducted a chi-square test to check for differences between the two concrete conditions in regard to perspective during the imagery exercise (field/observer). Kendalls Tau was calculated for the connection between the imagery perspective (field/observer) and mood repair.

T-tests for dependent samples were conducted separately for each condition to investigate mood repair (t1/t2). To test for the