Effects of Positive Mood on Attention Broadening for Self-related Information

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Abstract

Studies on cognitive effects of positive emotions have associated positive emotions to broadened attention. Given the widely investigated relationship between self-focused attention and mood, it is important to investigate the effect of positive mood on visuospatial attention for self-related information. We used a performance-based measure to assess fluctuations in attentional broadening from self-related contrasted to not-self-related information. In Experiment 1, we checked that the self-related versus not-self-related stimuli did not evoke differential attention effects in general. In Experiment 2, we manipulated mood and found that an increase in positive mood was associated with a relative broadening of attention for self-related information. These results suggest that the meaning of the target of attention provides an interesting dimension for further investigation into the relation between positive emotions and attentional broadening.

Keywords: positive emotions, self-related information, attentional breadth

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1. Introduction

Considerable research has focused on how emotion influences cognition, in relation to different functions of positive and negative emotions. Within the field of positive psychology, the broaden-and-build theory (Fredrickson, 1998; 2001) proposes qualitatively distinct functions for negative and positive emotions. This theory proposes that positive emotions, as opposed to negative emotions, broaden people's repertoire of thoughts and actions that come to mind. Research has supported this theory by linking positive emotions to broadened cognition; positive emotions have been shown to increase creativity, social openness, and visual attentional breadth (e.g. Fredrickson & Branigan, 2005; Garland et al., 2010; Isen, Daubman, & Nowicki, 1987; Rowe, Hirsh, & Anderson, 2007). These prior studies have also stimulated research into the conditions under which these broadening effects of positive emotions occur.

Research by Gable and Harmon-Jones (2008; 2011) suggests that the effect of positive emotions on visuospatial attentional breadth may depend on motivational factors. While positive affective states low in approach motivation broaden attention, which is in line with previous work (e.g. Fredrickson & Branigan, 2005), they found that positive affective states high in approach motivation were actually related to a relative decrease in global attentional focus (Gable & Harmon-Jones, 2008; 2011). Moreover, Förster and Dannenberg (2010) describe in their global versus local processing model (GLOMO^{sys}) the effects of mood on global and local processing. They mention that although explicit mood and approach/avoidance motivational factors may underlie effects on processing, these cannot explain all broadening effects (Förster & Dannenberg, 2010). They suggest that additional psychological factors (e.g. regulatory focus) may underlie the effects on processing, and their overview reveals the complexity of the effects on broadened attention or global processing.

Research on the attentional broadening effects of positive emotions has shown a sharp increase after Fredrickson (1998; 2001) elaborated on the cognitive broadening function of positive emotions. Interestingly, it is proposed that these broadening effects play an important role in the relation between positive emotions and resilience against stressful events and potentially against emotional disorders. Given the potential role of these attentional broadening effects, it is important to consider that in emotional disorders, cognitive processes are often affected depending on the processing of specific types of information (e.g. emotional valence of presented stimuli). There is an expansive literature relating emotional disorders to self-focused attention (e.g. Mor & Winquist, 2002). This literature indicates that (chronic) negative mood is related to a heightened focus on self-relevant information. In line with this, it has recently been proposed that rumination, a style of persistent negative thought, is associated with attentional narrowing on self-related information (Whitmer & Gotlib, 2012). On the other hand, research also shows that adopting a self-distanced perspective, allowing a focus on the broader context, is related to reduced distress and less rumination after recall of a negative event (Kross & Ayduk, 2011).

If we want to further investigate the attentional broadening effects of positive emotions, as these may be important in explaining the relation between positive emotions and psychological resilience, we need to consider the possible influence of the value of the presented information when measuring the attentional effects of positive emotions. Earlier research already suggested that the broadening effects of positive emotions may be influenced by characteristics of the presented information, such as emotional valence (Wadlinger & Isaacowitz, 2006). However, although it might be specifically relevant in the context of emotional disorders, to our best knowledge, no research so far has investigated how the attentional broadening effects of positive emotions may interact with the presence (or processing) of self-related information.

Former research has not yet focused on the value or meaning of the target of attention when investigating the broadening effects of positive emotions. That is, most studies examined visuospatial attentional broadening effect in relation to manipulations of mood or emotions (e.g. Fredrickson & Branigan, 2005; Gable & Harmon-Jones, 2008) but did not manipulate the content or meaning of the target of attention. Importantly, attentional broadening effects may occur because of the nature of a positive mood induction, but also because of the meaning or value of the attentional target. Therefore, it is important to examine whether broadening effects by positive emotions can be influenced on a trial-by-trial basis, due to the nature of the target in focal attention. In the current study we were interested in broadening in function of self-relevant information. Based on previous research on the relation between negative mood and self-focused attention and the effects of self-distancing, it can be expected that positive mood would be related to a broadening of attention (or loosening of attentional focus) for self-related information. In our study, this broadening of attention is operationalized at the level of visuospatial attention. Furthermore, in line with the observation that mood induction procedures (MIP) that elicit positive mood with low approach motivation tend to broaden attention, we used a MIP based on the recollection of positive autobiographical memories, and not a MIP using appetitive stimuli or approach motivating positive cues, which may be more likely to induce high approach positive mood (Gable & Harmon-Jones, 2008; 2011).

The present study examines the effects of positive mood on attention for self-related information using a performance-based measure of visual attentional breadth. The task is based on an attentional breadth task that has been successfully used before to measure fluctuations in attentional broadening/narrowing related to centrally presented, personally relevant information (Bosmans, Braet, Koster, & De Raedt, 2009). This task allows us to explore how the presentation of self-related information influences the broadening effect of

positive emotions contrasted to a comparison condition, that is, relative to effects for not-self-related information.

Given the previously shown association of positive emotions with visual attentional breadth and the relation between negative mood and a heightened self-focus, we hypothesized positive emotions to be associated with broadened attention for self-related information.

2. Experiment 1

To measure attention for self-related information we used a paradigm based on a task developed by Bosmans et al. (2009). This task was adjusted to measure attentional narrowing/broadening in relation to self-related as compared to not-self-related stimuli. Based on previous criticism about the use of "self" versus general "other" categories in implicit measures (e.g. Karpinski & Steinman, 2006), we used self-related stimuli in contrast to a non-defined but specific not-self category: "ME" (self-related) versus the name initials of an unknown other participant ("LR") who was said to have already taken part in this study.[1] The problem with self-related versus general other stimuli (e.g. ME, THEM) is that it is difficult to infer whether the effect is driven by self-related stimuli, or by the fact that other people in general (as a category) evoke attentional processes. However, a possible confound in the use of "ME" and "LR" as stimuli could be that the self category and not-self category are a word versus non-word respectively.[2] This problem is impossible to prevent because there are no suitable real two-letter words that can be used as a contrast category for "ME". Therefore, in experiment 1, under conditions without any mood manipulation we first investigated whether our self-related and not-self-related stimuli evoked differences in attentional broadening in

[1] We checked that none of the participants' name initials was LR.

[2] We considered using participants' own initials, but this is problematic as this introduces perceptual variance across participants. Moreover, some letters may be more familiar or form a word which could cause differences in attentional breadth for reasons other than mood. Finally, some name initials will consist of more than two letters and because the control initials have to match the length of the experimental stimulus, using stimuli of different length across participants, would again introduce perceptual variance across participants.

general (i.e. due to other factors than mood manipulation). Across the literature a quite consistent relation is found between negative affect and self-focused attention, notwithstanding the multifaceted nature of this concept (Mor & Winquist, 2002). Across the literature, results are however mixed with regard to whether self-related stimuli automatically capture attention in studies without any manipulation of mood. There are studies finding that self-related stimuli do automatically capture attention (Alexopoulos, Muller, Ric, & Marenda, 2012); however, other studies did not confirm this finding or suggest this appears only under specific conditions (Bundesen, Kyllingsbaek, Houmann, & Jensen, 1997; Devue & Brédart, 2008; Devue, Van der Stigchel, Brédart, & Theeuwes, 2009; Harris & Pashler, 2004). Given the mixed findings across the literature we would not necessarily expect differences evoked by self-related and not-self-related stimuli in general (in a healthy population).

2.1 Method

2.1.1 Participants.

Thirty-five undergraduate students (24 females) aged between 18 and 25 years (M = 19.97, SD = 2.04) volunteered to participate in this experiment in partial fulfilment of undergraduate course requirements or were paid €6 for their participation. This experiment was approved by the local ethical committee of the Faculty of Psychology at Ghent University.

Figure 1 about here

2.1.2 Materials.

In each trial of the experimental task a word appeared in the center of the screen; this word was either “ME” (Dutch = IK) or “LR”. Simultaneously with presentation of the central word, 16 gray dots with a diameter of 2 cm appeared around the word in two concentric

circles (see Figure 1). One circle appeared at 4.5 cm from the central word at 10° of the visual angle, the other circle appeared at 11.2 cm from the central word at 25° of the visual angle. The gray dots were arranged in pairs of two, one close and one far, situated on one of eight imperceptible axes. Simultaneously with the presentation of the word and gray dots, a smaller, black circle with a diameter of 1.3 cm appeared in one of the gray dots, either close or far. The smaller circle that could appear in one of the 16 gray dots was the target stimulus participants had to identify. After the simultaneous presentation of the stimuli, participants were asked to identify the central stimulus. After their response, they were asked to identify the axis on which the target stimulus (i.e. the smaller black circle) had appeared. The main dependent variable was the accuracy rate on the peripheral task (i.e. the proportion of correctly localized target stimuli) on trials in which participants also correctly identified the central word to make sure participants maintained attention to the center of the screen during the task. Because we were merely interested in early, automatic attentional processes, and in order to prevent confounds of saccadic eye movements in search of the peripheral target, all stimuli were presented for 68 msec (Ball, Beard, Roenker, Miller, & Griggs, 1988).

2.1.3 Experimental Design and Procedure.

All participants were seated at a distance of 27 cm from a 19” CRT-computer screen, using a chin rest to ensure correct positioning. The task consisted of 16 practice trials with a presentation time of 250 msec to allow participants to get acquainted with the task, followed by 16 practice trials with a presentation time of 68 msec. The test phase consisted of 128 trials, with four types of trials: “ME” close, “ME” far, “LR” close, and “LR” far which were randomly presented in two blocks consisting of 64 trials each.

2.2 Results and Discussion

In order to ensure that participants were focusing on the center of the screen during the task we deleted all trials in which the central word was incorrectly identified. This resulted in deleting an average of 1.58% of the trials.

2.2.1 Attention for self-related information.

We performed a 2 Word (ME versus LR) x 2 Distance (far versus close) ANOVA with accuracy rates on the peripheral task as dependent variable, that is, the proportions of correctly localized target stimuli. Table 1 shows the means and standard deviations for the proportions of correctly localized target stimuli for each type of trial. This analysis yielded only a significant main effect of distance, $F(1,34) = 127.16$, $p < .001$, $\eta_p^2 = .79$, indicating that in general the accuracy for localizing the peripheral target when it is close to the word (M = .93) is higher than when it appears further away (M = .60). No other effects were significant (Fs < 1.85).

These results indicate that when mood was not manipulated, participants did not show differences in attentional broadening between the self and not-self trials; that is, the presentation of a word versus non-word did not evoke differences in attentional broadening in general.

Table 1 about here

3. Experiment 2

Given the absence of general differences between the self- and not-self-related stimuli, we could investigate the influence of positive mood on attention for self-related information, being confident that the self- versus not-self-related words did not differentially influence attentional breadth in itself. In Experiment 2, we used the same task with the same central stimuli but now in relation to an experimental manipulation of mood.

3.1. Method

3.1.1. Participants.

Fifty-five other undergraduate students (45 females) between 17 and 30 years of age (M = 18.76, SD = 2.40) volunteered to participate in this study in partial fulfilment of undergraduate course requirements. Participants were randomly assigned to either a positive or neutral mood induction condition (MIP). This experiment was approved by the local ethical committee of the Faculty of Psychology at Ghent University.

3.1.2. Materials.

3.1.2.1 *Questionnaire measures.*

Mood state was measured using two visual analogue scales (VAS), with the anchor points “0%” and “100%” (0 to 10 cm, resulting in a 0-100 scale), measuring how happy and sad participants were feeling “*at this moment*” respectively. In the current study we decided to use VAS as these are most sensitive to fluctuations in affect due to their visual presentation (Rossi & Pourtois, 2012).

3.1.2.2. *Mood induction procedure.*

The MIP consisted of an imagery procedure where participants were instructed to vividly imagine either a self-provided neutral- or happy-inducing autobiographical memory. Participants first practiced the use of mental imagery by completing an imagery practice task of cutting a lemon (Holmes, Coughtrey, & Connor, 2008). Following this practice task, participants in the positive MIP condition were instructed to recall a memory of an event that happened on a specific day, more than one week ago, which made them feel very happy at that time, while participants in the neutral MIP condition were instructed to recall a memory of a specific event that did not elicit strong negative or positive emotions at that time. All participants were asked to shut their eyes and to describe what they remembered in detail. Participants were given instructions (Watkins & Moberly, 2009; based on Holmes et al.,

2008) to promote concreteness (e.g. “focus on how the event happened and imagine in your mind as vividly and concretely as possible a ‘movie’ of how the event unfolded”), and to promote field perspective imagery (e.g. “see it through your own eyes, from your own perspective”). Participants imagined the event for 30 seconds after which they were asked a series of questions (based on Watkins & Moberly, 2009), asking them to focus on what they could see, hear, and feel (e.g. “What can you see?”, “What physical or bodily sensations do you feel?”). Following these questions, participants were instructed to continue imagining the event for another 30 seconds without describing it. In order to strengthen the induction of the desired mood, music was played during imagining the autobiographical memory and continued playing throughout the task. To induce positive mood we used Mike Oldfield’s “Music of the spheres” (track 2, 3, 5, and 6). To induce neutral mood we used Chopin’s “Waltzes Nos. 11 and 12”, which have been successfully used to induce neutral mood in previous studies (Startup & Davey, 2001; Heene, De Raedt, Buysse, & Van Oost, 2007).

3.1.2.3. *Experimental task.*

To measure attention for self-related information the same task was used as in Experiment 1.

3.1.3. Experimental design and procedure.

Participants were randomized to receive either the positive or the neutral MIP. After informed consent, baseline levels of mood were measured with the VAS. Following this, participants completed the MIP and mood was measured again immediately afterwards. After the MIP, participants performed the experimental task. All participants were seated at a distance of 27 cm from a 19” CRT-computer screen, using a chin rest to ensure correct positioning. Participants received eight practice trials with a presentation time of 250 msec to allow participants to get acquainted with the task, followed by eight practice trials with a presentation time of 68 msec. The test phase consisted of 96 trials which were randomly

presented in two blocks consisting of 48 trials each (the task was shortened as compared to Experiment 1 to maximize the chance that the mood induction effects would remain present during the whole task).

3.2. Results and Discussion

As we are interested in the direct effect of positive mood on attentional breadth for self-related information, taking into account interindividual differences in the effectiveness of the MIP that are neglected when analyzing the data on a group level, the change in positive mood was used as a continuous predictor to enhance power. Early research on the affective contrast theory (Bacon, Rood, & Washburn, 1914; Manstead, Wagner, & MacDonald, 1983) has shown that the impact of mood states depends on a contrast with the prior perceived state, therefore it was decided to look at the effects of the change in positive mood across the mood induction. Importantly, notwithstanding that the data are derived from two MIP groups (positive and neutral), based on graphical exploration and nonsignificant normality tests (both Kolmogorov-Smirnov and Shapiro-Wilk yielded $p > .05$) the change in positive mood was normally distributed. For the analyses of attention for self-related information, all trials were deleted in which the central word was incorrectly identified, to ensure that participants were focusing on the center of the screen during the task. This resulted in deleting an average of 6.23% of the trials. No differences were found between groups in terms of the percentage of trials that was deleted ($t < 0.5$).

Table 2 about here

3.2.1. Group characteristics.

Twenty-eight participants received the positive MIP and 27 participants received the neutral MIP. Table 2 shows the mean and standard deviation for each variable. There were no

significant differences between the groups in terms of gender, χ^2 (1, N = 55) = 0.004, p = .949, age, and baseline mood measures, all ts < 1.70.

3.2.2. Mood manipulation check.

To assess the effect of the MIP on mood, mixed ANOVAs with Group (Positive MIP versus Neutral MIP) as between subject factor and Time (before versus after the MIP) as within subject factor was performed, separately for the happy and sad VAS. For the happy VAS, this revealed a significant Group x Time interaction, $F(1,53) = 8.67$, $p = .005$, $\eta_p^2 = .14$, whereas no Group x Time interaction for the sad VAS was found, $F(1,53) = 0.98$, $p = .327$, $\eta_p^2 = .02$. The Group x Time interaction was driven by a significant increase in levels of happiness in participants in the positive MIP group, $t(27) = 3.82$, $p = .001$, whereas participants from the neutral MIP group did not show such an increase, $t(26) = 0.27$, $p = .792$. While the positive and neutral group did not differ in levels of happiness before the MIP (M = 71.71 and M = 66.19 respectively), $F(1,53) = 2.14$, $p = .149$, $\eta_p^2 = .04$, the positive MIP group reported significantly higher levels of happiness than the neutral group afterwards (M = 80.71 and M = 66.63 respectively) when controlling for mood at baseline, $F(1,52) = 9.73$, $p = .003$, $\eta_p^2 = .16$.[3]

3.2.3. Mood and attention for self-related information.

We performed a 2 Word (ME versus LR) x 2 Distance (far versus close) ANOVA with the change in positive mood across the mood induction (ΔVAShappy, M = 4.80, SD = 11.51) as a continuous predictor and the proportions of correctly localized target stimuli as dependent variable. Table 3 shows the means and standard deviations for the proportions of correctly localized target stimuli for each type of trial across all participants (i.e. regardless of the change in positive mood). This yielded a significant main effect of distance, $F(1,53) = 345.94$,

[3]Results of the analysis without correcting for baseline mood yielded similar results, $F(1,52) = 10.28$, $p = .002$, $\eta_p^2 = .16$

$p < .001$, $\eta_p^2 = .87$, a significant main effect of ΔVAShappy, $F(1,53) = 6.72$, $p = .012$, $\eta_p^2 = .11$, and a Word x Distance x ΔVAShappy interaction, $F(1,53) = 5.55$, $p = .022$, $\eta_p^2 = .10$.

To explore the direction and magnitude of this significant interaction, an index of Attentional Narrowing (ANI = accuracy stimulus close to word - accuracy stimulus far from word) was calculated for both self trials and not-self trials, and subsequently an ANI difference score (ΔANI = ANIself - ANInotself) was calculated (based on Bosmans et al., 2009). Higher ΔANI scores reflect stronger attentional narrowing when the central word was self-related contrasted to attentional narrowing when the central word was not-self-related. To investigate whether attentional breadth for self-related relative to not-self-related information is modulated by changes in positive mood we examined correlations between changes in positive mood and ΔANI scores. ΔVAShappy was negatively correlated with ΔANI, $r = -.31$, $p = .022$.[4] In line with our hypothesis, these results indicate that a bigger increase in positive mood was associated with a relative broadening of attention for self-related information.

Table 3 about here

3.2.4. Additional analyses.

Experiment 1 showed there were no significant attentional effects of the self and not-self related stimuli independent of mood manipulation effects. Experiment 2 showed that attentional broadening for self-related information contrasted to not-self-related information was influenced according to the change in positive mood. Additional analyses were performed to test whether the effects on attentional broadening without mood manipulation are

[4] The change in positive mood was also correlated with the single accuracy scores on the peripheral task in both Word conditions (i.e. ME-close, ME-far, LR-close, LR-far trials). Results showed that an increase in positive mood was significantly associated with an increase in accuracy for localizing the target stimulus when it appeared far from the central stimulus in both the self condition, $r = .36$, $p = .008$, and in the not-self condition, $r = .30$, $p = .024$. An increase in positive mood was also correlated with an increase in accuracy for localizing the target stimulus when it appeared close to the central stimulus in the not-self condition, $r = .30$, $p = .024$.

statistically significant different from the effects found according to an increase in positive mood. As experiment 1 did not involve a mood measure whereas experiment 2 tested the influence of the change in positive mood, we divided the participants from experiment 2 according to whether they showed an increase in positive mood above the overall average change (M = 4.80) or not. That is, a division was made between participants who increased in positive mood with more than 4.80 points (n = 23) on the VAS scale and participants who showed an increase of less than 4.80 points or even showed a decrease (n = 32). These two groups were compared to the participants from experiment 1 who received no mood manipulation (n = 35). As the assumption of homogeneity of variance was violated, we performed a nonparametric Kruskal-Wallis test to check for group differences on the calculated ΔANI score (ANI = accuracy stimulus close to word - accuracy stimulus far from word, ΔANI = ANIself – ANInot-self) representing attentional narrowing for self-related information contrasted to not-self-related information. This analysis showed a significant group difference, $H(2) = 6.68$, $p = .035$. Follow-up Mann-Whitney tests showed no differences in ΔANI between the participants who received no mood manipulation and participants who showed a change in positive mood of less than 4.80 points, $U = 521$, $p = .624$, $r = -.06$. Mann-Whitney tests between the participants without mood manipulation or participants with a change in positive mood of less than 4.80 points, and participants with an increase in positive mood above average showed significant differences, $U = 265$, $p = .029$, $r = -.29$ and $U = 230$, $p = .019$, $r = -.32$ respectively. These additional analyses showed that the participants without mood manipulation did not significantly differ on ΔANI (M = .03) from participants with a change in positive mood of less than 4.80 points on the VAS scale (M = .05). However, participants with an increase in positive mood above the average change (i.e. with more than 4.80 points on the VAS scale), as compared to the other two groups, showed a

significant smaller attentional narrowing index for self-related information contrasted to not-self-related information (*M* = -.05).

4. General Discussion

The objective of this study was to investigate the relationship between positive mood and attention for self-related information. We hypothesized that positive mood would be related to a relative broadening of attention for self-related information, which was confirmed by our results. Our study is the first to show a broadening of visuospatial attentional breadth in relation to self-related information relative to not-self-related information using a performance-based measure.

The broaden-and-build theory, which makes a qualitative distinction between positive and negative emotions in their effect on cognition (Fredrickson, 1998; 2001), proposes a broadening function for positive emotions. Previous research has supported this theory by relating positive emotions to broadened visual attention, exploratory activity, and openness to others (for review see Garland et al., 2010). However, other research (e.g. Förster & Dannenberg, 2010; Gable & Harmon-Jones, 2008) suggests that besides emotional states also other factors may underlie the broadening effects of emotion. In the present study we only manipulated explicit mood using the recall of positive events, which is likely to induce low-approach positive mood (Gable & Harmon-Jones, 2008). We focused on manipulating the meaning of the target of attention itself, which remained under investigated to date, and investigated how this is interacting with the effects of positive mood on attentional broadening. The results from our study complement previous findings by showing the interaction of positive mood with trial-by-trial fluctuations in attentional broadening based on the value or meaning of the target of attention.

Previous research on the attentional broadening effects of positive emotions (e.g. Fredrickson & Branigan, 2005; Rowe, Hirsh, & Anderson, 2007) mostly investigated this

relation with tasks using neutral (not-self-related) stimuli and looking at the effects of positive mood on 'tonic' attentional breadth. The task used in the current study allowed us to investigate effects of positive mood in relation to trial-by-trial fluctuations in attentional breadth (or 'phasic' attentional breadth) for self-related information relative to not-self information. Clearly, the current findings suggest that the breadth of attention - in interaction with mood – can efficiently be adjusted in a phasic manner based on the nature of encountered visual stimuli.

Investigating the effect of positive emotions on attentional processes in the presence of self-related information may especially be pertinent in the context of stress resilience as negative emotions have been associated with an increased self-focus (Mor & Winquist, 2002) and moreover, it is likely that people in those situations are confronted with information that is not neutral but related to the self. The effect of positive mood on broadened visuospatial attention (or a loosening of attentional focus) for self-related information may also further facilitate engagement in exploratory behavior, openness to new information, and social openness. By these broadening effects, positive emotions may play a role in building resources and developing or strengthening both physiological and psychological resilience over time (Fredrickson 1998; 2001; Tugade & Fredrickson, 2004), though such a mediation model has yet to be tested experimentally.

A possible limitation to the present research is that, by design, the self-category and not-self-category are a word and non-word respectively. Therefore, in the first experiment we checked whether these stimuli would evoke a different attention effect in general, and we did not find a Word x Distance interaction. Based on previous criticism about using self versus other categories in implicit measures (e.g. Karpinski & Steinman, 2006), the use of a self versus non-defined but specific not-self category seemed most appropriate.

In summary, the current results indicate that an increase in positive mood is associated with a broadening of attention for self-related information when contrasted to not-self-related information, on a trial-by-trial basis. Our performance-based measure of attention for self-related information, based on an existing attentional breadth task (Bosmans, et al., 2009), provides an interesting task to use in further exploration on how mood changes interact with fluctuations in attentional breadth on a trial-by-trial basis. Furthermore, the results of the present study suggest that the meaning or value of the target of attention provides an interesting factor for further investigation into the relation between positive emotions and attentional broadening.

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Table 1

Experiment 1: Proportion of correctly localized target stimuli for each type of trial

M (*SD)*	Word: "ME"	Word: "LR"
Distance: close	0.94 (0.08)	0.93 (0.08)
Distance: far	0.60 (0.22)	0.61 (0.22)

Table 2

Experiment 2: Group Characteristics

	Neutral MIP *M* (*SD*)	Positive MIP *M* (*SD*)
Age	19.30 (3.24)	18.25 (0.89)
Gender	22 females	23 females
VAS happy pre-MIP	66.19 (13.81)	71.71 (14.21)
VAS sad pre-MIP	10.11 (13.08)	8.79 (8.40)

Table 3

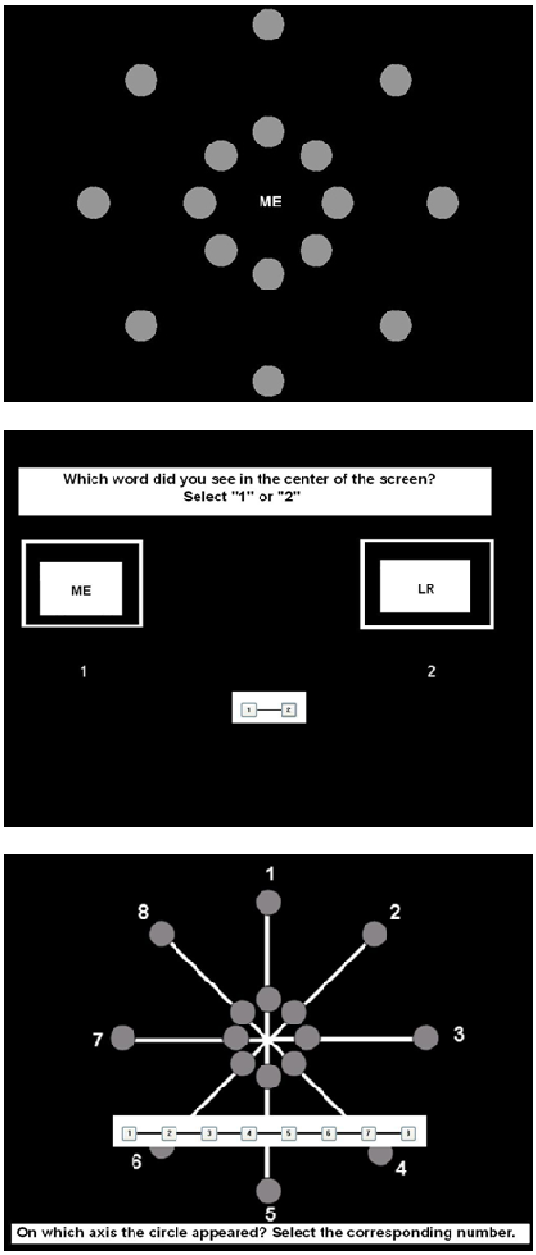
Experiment 2: Proportion of correctly localized target stimuli for each type of trial across all participants (i.e. regardless of change in positive mood)

M (*SD)*	Word: "ME"	Word: "LR"
Distance: close	0.76 (0.19)	0.75 (0.19)
Distance: far	0.26 (0.13)	0.25 (0.13)

Figure Captions

Figure 1. Stimulus presentation of the Attentional Breadth Task. The gray dots are presented in pairs of two, simultaneously with the central word and the target stimulus. The first response screen asks participants which word they have seen. The second response screen asks participants on which of eight axes the target stimulus was presented.

Figure 1.


ME
Which word did you see in the center of the screen?
Select "1" or "2"
ME
LR
1
2
1
2
3
4
5
6
7
8
On which axis the circle appeared? Select the corresponding number.