Introduction

The attentional blink (AB) is a decreased ability to detect a target stimulus that rapidly (within ~500ms) proceeds a previously detected target. It is as if attention "blinks", missing the second target in a stream of stimuli (see Figure 1). This is thought to occur per the overinvestment hypothesis because attentional resources are over-allocated to detect the first target (T1; Olivers & Nieuwenhuis 2006), leaving insufficient resources for the second target (T2).

Mindfulness meditation decreases the AB (Slagter et al. 2007), hypothetically because this type of meditation facilitates distributed attention (and consequently, less investment in a particular stimulus). In addition to the Overinvestment Hypothesis, Olivers and Nieuwenhuis (2006) proposed the Positive Affect Hypothesis. This hypothesis is a species of the Overinvestment Hypothesis, proposed to capture research which demonstrates that positive affect also reduces the AB (Olivers & Nieuwenhuis, 2006; Jeffries et al., 2008; MacLean et al., 2009). Like mindfulness meditation, positive affect facilitates distributed attention (Srinivasan et al., 2009). Therefore, meditations which are designed to increase positive affect should also reduce the AB.

In previous research (Burgard & May, in press), 10 minutes of Metta meditation did not reduce the AB. In Metta meditation participants focus on sending and receiving feelings of "loving kindness" and compassion. This null result, however, may have resulted from either insufficient levels of positive affect, or a difficulty sustaining positive affect, in those with no previous Metta experience. To examine this possibility, we conducted two experiments to test the influence of Metta meditation practice on the AB. In the first experiment, participants did not meditate immediately prior to completing the AB task (to determine if there was a trait effect), and in the second experiment, participants did meditate immediately prior to completing the AB (to determine if there was a state effect).

Method

Participants:
- 13 (3 men, 10 women) M(age)=22.08) students enrolled in a research course taught by Dr. May were assigned to the meditation group.
- 14 volunteers (3 men, 11 women) M(age)=23.21) from the Carroll University student body constituted the control group.

Materials:
- Participants completed 260 trials (see Figure 1 for trial details), 65 with T2 at position 12, 65 at position 17, and 130 with no T2; trials randomly placed into 5 blocks of 52 trials.

Procedure

Experiment 1:
- Meditation group was instructed to meditate for at least 15 minutes per day, four days a week, for six weeks. Meditators logged actual meditation times. On average, participants mediated 485.15 minutes (SD = 71.31).
- Participants were tested twice, before and after the meditation group undertook Metta training.
- At both pre- and post-test, participants were administered the Five Facet Mindfulness Questionnaire (FFMQ), and Positive Affect Negative Affect Schedule (PANAS).

Experiment 2:
- Meditation group meditated for 10 minutes, immediately preceding the AB task.

Results

Figure 2. Means (with standard error bars) of meditators’ and control participants’ difference scores (post-test minus pre-test) on sub-scales of the Five Factor Mindfulness Questionnaire (FFMQ), and Positive Affect Negative Affect Schedule (PANAS).

Figure 3. Comparisons of mean affect (with standard error bars) for meditators and control participants before (Pre) and after (Post) the meditators began their training program. Higher PA-NA scores indicate higher positive affect, lower negative affect, or both.

Figure 4. Mean attentional blink (AB) scores (with standard error bars) under four different conditions: No meditation prior to completing the AB (No Metta, No training), meditation prior to the AB without having previously practiced Metta (Metta, No training), completion of the AB without a preceding meditation; following 6 weeks of Metta practice (No Metta, Training), and meditation just prior to completion of the AB, following 6 weeks of Metta practice (Metta, Training).

Discussion

Previous studies have shown that metta meditation without practice does not produce attentional alterations (May & Burgard in Press). Experiment 1 shows that after six weeks of practice, metta meditators experience qualitative changes, such as being more observant, descriptive, and experiencing less negative affect; however, six weeks of meditating did not produce a trait effect that improved their attention. This could be due to the fact that positive affect was not increased in meditators versus the controls. This could also account for the improvement in experiment 2 when practiced metta meditators spent ten minutes meditating before taking the AB test.

References