

Abstract

When performing an attention task, we unconsciously inhibit sensory stimuli that are irrelevant to the task at hand. This inhibition can be fatiguing. One potential way to reduce this inhibition is the practice of mindfulness meditation. In the current work, we examine the validity of this concept through behavioral measurements using a method we confirmed to evaluate the degree of inhibition of distractors. The proposed method utilizes the distractor devaluation effect, which refers to an object receiving a less positive preference when it is presented as a distractor and is inhibited. Using this method, we showed that a 30-minute meditation intervention effectively reduced the inhibition of the distractor. Recently, meditation has been shown to contribute to well-being. By utilizing our findings, we can more deeply investigate the mechanisms underlying the reduction of inhibiting sensations and emotions, which are important in meditation. These results will ultimately contribute to the development of more effective and efficient meditation practices.

Issues with previous meditation research

Mindfulness meditation

- A technique for maintaining an awareness of present experiences without suppressing them.



**Focused Attention Meditation (FAM)**  
Voluntary focusing of attention on a chosen object.

**Open Monitoring Meditation (OMM)**  
Non-reactive moment-to-moment monitoring of the contents of one's experiences as they are.

Issues with previous research

- No studies have provided evidence that mindfulness meditation reduces inhibition processes using behavioral measurements.
  - Conventional attentional interference tasks can assess the degree to which attentional processes are not interfered with, but not the degree of inhibition to the stimulus.
- Devise an evaluation method (Exp. 1)  
→ Examine the impact of meditation (Exp. 2)

Devise an evaluation method (Exp. 1)

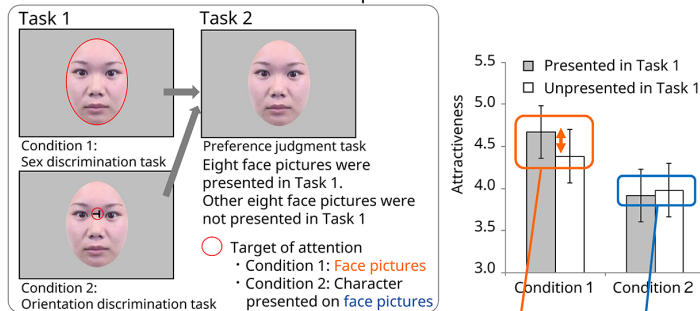
Point: Mere exposure effect & Distractor devaluation effect

An increase in preference for an object after an individual is repeatedly exposed to it.

An object receiving less positive or more negative preference when it is presented as a distractor.

Method: Attention task & Preference judgment task

- Condition 1: Facial expressions are the target stimulus
- Condition 2: Facial expressions are the distractor

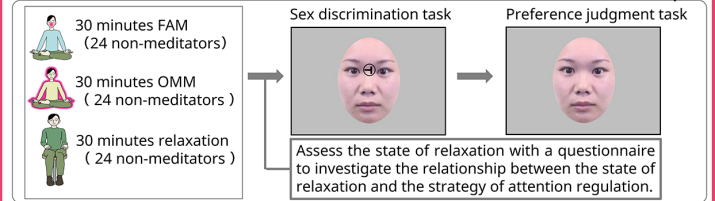


- Results**
- ① Condition 1: Increased attractiveness → Mere exposure effect
  - ② Condition 2: No change → Distractor devaluation effect
- Even for facial pictures, whose attractiveness increases with repeated exposure (Condition 1), attractiveness decreased after suppression (Condition 2).  
→ A task set of Condition 2 can be used to assess the degree of inhibition.

Examining the impact of meditation (Exp. 2)<sup>[1]</sup>

**Hypothesis: If meditation reduces inhibition of a distractor, the mere exposure effect would be solely observed in the preference judgment task.**

Method: 30-Min Intervention → Task set of Condition 2 of Exp. 1



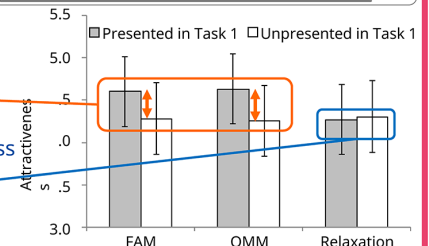
Results

① FAM/OMM groups:

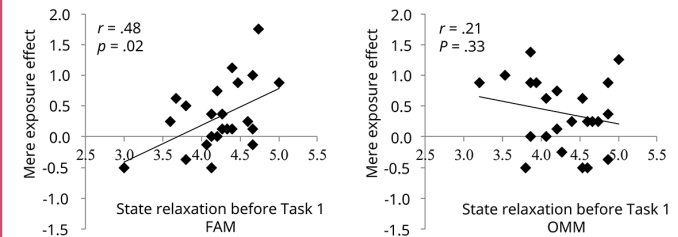
Increased attractiveness = Mere exposure effect

② Relaxation group:

No change in attractiveness = Distractor devaluation effect



→ Decreased inhibition of a distractor in FAM and OMM groups



③ FAM group: There was a correlation between state of relaxation and mere exposure effect. → Attention control strategy influenced by the state of relaxation was used.

④ OMM group: No correlation between state of relaxation and mere exposure effect. → Attention control strategy not influenced by the state of relaxation was used.

**Conclusion: Mindfulness meditation reduces inhibition processes. FAM & OMM may have different attention control strategies.**

References

[1] M. Fujino, Y. Ueda, V. Inoue, Y. Ooishi, N. Kitagawa, M. Nomura, "Evidence of difference in emotion regulation between focused attention meditation and open monitoring meditation," in *Proc. Contemplative Science Symposium* (Poster sessions), 2019.

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