**Comparing brief mindfulness manipulation (BMM) to attention feedback awareness and control computer-based training (A-FACT)**

Potential participants will be recruited at the University of Haifa, other universities and general population in Israel. Participants will be screened through a web-based assessment (Qualtrics), in which they will provide informed content and fill-out demographic information, a brief rumination questionnaire (RRS, brooding scale) and a question about suicidal ideation (from the PHQ-9?). Those high on the rumination score (>CUTOFF) and with no indication to suicidal ideation, will subsequently be contacted for further participation in the experiment. Additional exclusion criteria are: < 18 years of age; uncorrected vision problems; hearing problems; self-reported mother tongue other than Hebrew.

Eligible participants will complete a web-based Simulated Thought Paradigm (STP) stimuli ranking and recoding at home, using their computer or smartphone. During this web-based procedure they will: (1) rate the frequency and negative emotional reactivity for a list of sentences that reflect neutral and negative thoughts; and (2) record the negative sentences and emotionally neutral sentences in their own voice. These will be used as idiographic stimuli in the experimental sessions.

***Procedure***

The main session will be held on “Zoom” virtual meeting or at the Universe of Haifa. If the participant will choose to participate in a remote running via “Zoom”, the experimenter will install python-based program that run the experiment on the participant’s computer by using remote control. During the installation, the participant will complete self-report measures of: \_\_\_\_\_\_\_*Omer (baseline)*\_\_+ pre questionaire\_\_\_ through a web-based assessment (Qualtrics) using smartphone. The \_\_\_\_\_*Omer*\_\_\_\_\_ questionnaire and the *Body Maps Task* will be used as pre-post correlates.

Then, participant will be randomly assigned to one of three training groups: *Attention Feedback Awareness and Control Training* (A-FACT); *Brief Mindfulness Manipulation* (BMM); or the *Control “placebo”* group. The *Digit Categorization Task* (DCT) will be introduced before and after each group’s training (*A-FACT/BMM/Placebo*). After the post-training DCT, the following tasks will be administered to all groups: the *Meta Awareness for Bias Self-Caught* (MAB-SC) task and the *One-Back Dichotic Listening* *task* *with STP*.

***Tasks’ descriptions***

The *Body Maps Task* measures change, from pre- training to post- training, in interoceptive attention via subjective assessment (i.e. sensibility) of the frequency, location, intensity and hedonic tone of bodily sensations, as well as change in emotional experience (5-point Likert scale ranging from 1 to 5), in response to negative and neutral self-referential thoughts. \_\_\_\_\_*Omer*\_- the task consists of X STP trials (out of which X are neutral STPs and X are negative STPs). First all the neutral STP trial are being played, and then participants are requested to rank their current emotional state (using the Likert scale for Anxiety, Curiosity ……????…). Then they are asked to click on locations over a body map where they notice different emotions and to express the intensity of these sensations (by repeatedly clicking on a certain area) this process is being repeated, the second time with all the negative STPs

In the *Digit Categorization Task* (DCT) participants will be asked to categorize whether a digit between 1 and 8 presented on a monitor is odd or even, while listening to simulated neutral or negative thoughts (Amir, Ruimi, & Bernstein, 2021). DCT measures one’s ability to exercise attentional control and disengage from negative content by measuring reaction time (RT) to the categorization demand. The task consists of 20 STP trials (10 different STPs repeated twice throughout the task), out of which 5 are negative STPs and 5 are neutral STPs; Each trial start with three Xs for 1000 ml before an STP sentence is being played. 500ms before the end of the sentence, the middle X is replaced by a digit ranging from 1 to 8.

*The attention feedback awareness and control computer-based training (A-FACT)* is a training that aims to increase awareness to attentional bias toward negative thoughts, and thereby to train attentional control. It contains the Squares Categorization-STP task, in which participants will be asked to categorize whether the number of squares presented on a monitor is more or less than five, while listening to simulated neutral or negative thoughts. The training based on feedback on attentional bias following negative thought (Bernstein & Zvielli, 2014). The task consists of 80 STP trials (40 different STPs repeated twice throughout the task), out of which 40 are negative STPs and 40 are neutral STPs; Each task begins with 1000ml of a “+” fixation, and then an STP sentence is being played. 500ml before the end of the sentence a matrix of 3X3 (9 in total) squares is presented where a random number, between 1 and 9 (excluding 5), of squares are filled in white while the rest are empty (outline of all 9 squares is always white).

*The brief mindfulness manipulation (BMM)*aims to train mindfulness skills of present moment awareness, and specifically the ability to disengage attention to thoughts by focusing on a body object (i.e. the breath). The task is comprised of focused attention mindfulness mediations toward the breath, in which participant are trained to press a button after each instance of awareness for an inhalation or an exhalation, and to not press while noticing that their awareness was drown to the STPs content. In this instances participant are instructed to disengage from the STP content, and to re-focus on the breath. The BMM task has the same amount and composition of trials as in A-FACT. This task starts with an recorded instructions that are divided to three phases: (a) mindfulness towards the breath meditation – in this phase participants are instructed to press the Space button in each instance of noticing inhalation and exhalation, (b) noticing and disengaging from mind wandering – participants are instructed to not press the button while not focused on the breath, to notice the mind wandering and the gently return to focusing on the breath and pressing the Space button, and (c) noticing STPs as thoughts and retuning to focusing on the breath – participants will be requested to notice the STPs as thoughts and the gently refocus their attention on the breath and to press the Space button only where their awareness is back on the breath. After the third phase, participants will continue the mindfulness breath focused meditation while attending to STPs and redirecting their attention to the breath. Throughout all the task a “+” fixation will be presented on the monitor.

*The control “placebo” group* contains the Squares Categorization-STP task (parallel to A-FACT) , without the “active ingredient” of feedback about attentional bias. The control task has the same amount and composition of trials as in A-FACT.

The *Meta Awareness for Bias Self-Caught* (MAB-SC) is a task that quantifies awareness for moment-to-moment attentional biases (Ruimi, Hendren, Amir, Zvielli & Bernstein, 2020). In the task, participants undergo DCT while listening to STPs. In addition, participants are requested to voluntarily report on instances where they noticed their thoughts are being drawn to the content of an STP stimulus (these reports are refereed as self-caught). The task consists of STP 30 trials (30 different STPs repeated once throughout the task), out of which 15 are negative STPs and 15 are neutral STPs; Each trial start with three Xs for 1000 ml before an STP sentence is being played. 500ms before the end of the sentence, the middle X is replaced by a digit ranging from 1 to 8. Using signal detection analytical approach meta-awareness for bias is quantifies by contrasting self-caught reports with trial-level expression of bias that is computed from the categorization RT.

In the *One-Back Dichotic Listening* *task with STP* participants hear two separate auditory channels, in each ear, that contain STP stimuli. The left channel contains negative STP stimuli and right neutral. At pseudo-random intervals, the simulated thought stimulus in one of the channels is presented sequentially (i.e., specific STP recording is repeated). The task consists of 96 neutral STP trials and another 96 negative STP trials (the sum of trials remains 96 because negative and neutral trials occur separately and relatively simultaneously in the different auditory channels). For each trial, participants are asked to press one of two buttons corresponding to the channel (LEFT/RIGHT) if in this channel an STP stimulus was repeated sequentially. Throughout all the tasks a “+” fixation is presented on the monitor (Amir, Ruimi, & Bernstein, 2021).

Bibliography:

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