Attentional Bias of Self-Related Information in Self-Disgust

Keywords: self-disgust, self-consciousness, attentional bias

Department of Behavior and Health Sciences
Wen Guo

Introduction
Self-disgust is defined as a maladaptive psychological phenomenon including a stable pattern of disgust-based, cognitive-affective responding to the self (Powell, et al., 2015).

Powell and his colleagues (2014) observed an avoidance behavior in self-disgust sufferers, showing as a tendency that high self-disgust sufferers avoid looking at their reflections in the mirror. Furthermore, compared with low self-disgust sufferers, individuals with high self-disgust performed differently toward the faces of themselves and other people.

The concept of self-disgust and its relationship to other mental disorders or emotional disorders has been discussed detailedly by previous research. However, the mechanisms and the cognitive characteristics of self-disgust have remained unknown.

The purpose of the present study is to explore the attentional bias of self-related information in self-disgust. Experiment 1 investigated the correlation between self-disgust and self-consciousness, providing a theoretical basis for the following experiments. Experiment 2 used the dot-probe task, explored attentional bias toward self-information in the self-disgust sufferers. As a complement, Experiment 3 further discussed the attentional bias found in Experiment 2 by using the visual search task.

Experiment 1
The purpose of Experiment 1 was to explore the relationship between self-disgust and self-consciousness. According to previous research, the hypothesis was H1: self-disgust is positively correlated with self-consciousness significantly.

Methods
Participants
Totally 323 participants (108 females, 215 males) were recruited via Yahoo! Crowdsourcing Service Japan with an average of 44.48 years old (range: 15-73, SD = 10.16).

Materials
Self-disgust Scale (SDS). The SDS (Mizuna, 1996) is a 21-item, self-report scale used for measuring self-disgust.

Self-Consciousness Scale for Japanese (SCS). The SCS (Sagawara, 1984) is a 21-item, self-reported scale, including two main factors: private self-consciousness and public self-consciousness.

Results
Each participant’s total scores of SDS and SCS were analyzed. The results showed a positive correlation between the total scores of SDS and SCS (Pearson's $r = .457$, $p < .001$). Moreover, gender difference was found in SCS, in which female scored higher than male, $t (317) = 2.247$, $p = .025$, Cohen's $d = 0.268$.

Discussion
Consistent with previous research (Mizuna, 1996), Experiment 1 found a positive correlation between self-disgust and self-consciousness, which supported H1. According to previous research, a high level of private self-consciousness leads to more attributions to oneself, individuals are more likely to over concern their mistakes, doubt their way of acting, and easier to perceive perfectionistic demands.
from their environment (Buss & Scheier, 1976). Therefore, self-attribution may connect self-consciousness and self-disgust.

**Experiment 2**

Experiment 2 aimed to explore the attentional bias of self-related information in self-disgust through the dot-probe task.

Based on previous research, the hypotheses were H2: participants with high self-disgust showed attentional bias towards self-related information. H3: participants with high self-disgust responded significantly faster in the congruent condition.

**Methods**

**Design**

2 self-disgust level (high vs. low) × category (facial photo vs. word) × 2 congruence (congruent vs. incongruent), mixed design.

**Participants**

Thirty-three students from Kyushu university with an average age of 23.15 years old ($SD = 2.99$).

Based on the scores of SCS, the participants were divided into high (top 25%) and low (bottom 25%) self-disgust groups ($t (14) = 12.3$, $p < .001$, Cohen's $d = 6.17$).

**Materials**

Experiment 2 used the dot-probe, which including a photo block and a word block.

In the photo block, stimuli consisted of participants' facial photos taken on-site and neutral facial photos selected from Chicago Face Database, Japanese Female Facial Expression Database and a preliminary experiment in which photos were created by AI. All facial photos were processed by Adobe Photoshop CC (version 20.0.7, Adobe Systems Inc) into $187 \times 227$ pixels, 72 pixels/inch, black and white images without background color. Each size was $6.6 \times 8cm$.

In the word block, stimuli consisted of participants’ full names and 40 neutral Japanese words selected from Goto, Ota (2001).

**Procedure**

The experimenter first took a photo with a neutral expression of each participant with his permission. Then the photos were processed while participants were filling out the SDS.

In the dot-probe task, each block had 120 trials, for a total of 240 trials for one participant. One trial began with two $80\times80$ mm, visual angles of $7.59^\circ$, black square outlines on the screen's left and right sides. Inside one of them were a smaller ($70 \times 70$ mm) black square outline. After $1000$ ms, the cue probe, a $30$ mm red line, appeared randomly in horizontal or vertical directions inside the double-lined square outline and lasted for $500$ ms. The screen was then cleaned, and the stimuli appeared in pairs (self-related vs. neutral) on both sides of the screen and lasted for $1,000$ ms. After that, a target probe, a $30$ mm red line, appeared horizontal or vertical on the screen's left or right side again. Participants were instructed to determine whether the cue probe and target probe's direction were consistent as quickly and accurately as possible. If the cue probe's direction was the same as the target probe's, it defined as a congruent condition. Otherwise, it was an incongruent condition. After response, the next trial begun after $1,000$ ms.

**Results**

Results of ANOVA found a significant main effect of self-disgust level ($F (1, 56) = 13.779$, $p < .001$). Participants from high self-disgust group responded faster on both congruent and incongruent conditions than low self-disgust group. No main effect of condition or category was found. Interaction between three factors was not significant.
The index of attentional bias in the dot-probe task was defined as a difference of the mean of RTs\(_{\text{incongruent}}\) and the mean of RTs\(_{\text{congruent}}\) for each participant. Positive difference indicated the existence of selective attention toward self-related information, while negative difference indicated the existence of attentional avoidance. Results of One sample t test (compared to 0) found that participants with high self-disgust showed an attentional avoidance only in the word condition (t(7) = -2.588, p = .036). No attentional bias was found in low self-disgust group no matter what the condition were.

**Discussion**

Experiment 2 found that participants with high self-disgust responded faster on congruent condition than those with low self-disgust, which supported H3. Meanwhile, the high self-disgust group showed an attentional avoidance only toward their names within 1000 ms, which partially supported H2. According to Ypsilanti and his colleagues' study (2020), older adults with high self-disgust also showed an attentional avoidance to their faces at 4000 ms and 5000 ms. Considering the participants in Experiment 2 were university students, it indicated that occurrence of attentional bias varied across age.

**Experiment 3**

Experiment 3 aimed to further explore the attentional bias toward own facial photos by a visual search task.

The hypothesis was H4: the reaction times of participants with high self-disgust were significantly faster when exploring their faces in others’ facial photos than the low self-disgust group.

**Methods**

**Design**

2 self-disgust level (high vs. low) × 2 condition (with target vs. without target), mixed design.

**Participants**

Thirty-seven students from Kyushu University with an average age of 23.08 years old (SD = 2.87).

The method of group dividing was the same with Experiment 2.

**Materials**

Two kinds of stimuli were involved in the visual search task: targets (participants’ facial photos taken on-site) and distractors (other neutral facial photos used in Experiment 2).

**Procedure**

There were 160 trials for each participant, in which half were with target condition, the other half were without target condition.

In the visual search task, each trial contained nine photos. On with target condition, one of them was participant’s facial photo; on without target condition, none. The target has the same probability of appearing in each of the nine positions. Participants were asked to determine whether their own photos appear as soon as possible by pressing “y” key for “YES” and “n” key for “NO”.

**Results**

Results of ANOVA found a significant main effect of self-disgust level (F(1, 32) = 6.689, p = .014). However, no main effect of condition was found (F(1, 32) = .388, p = .538). There was also no interaction between self-disgust level and condition (F(1,32) = .164, p = .688).
Discussion

Participants with high self-disgust responded faster on with target condition, which supported H4. Results indicated that high self-disgust sufferers were more sensitive to their own facial photos. Given that one's own facial photos may induce a feeling of dysphoric or dysphoric thoughts and thus represent a negative schematic representation of the self (Ypsilanti et al., 2020), it is assumed that participants with high self-disgust avoided seeing their faces by completing the search task quickly.

General Discussion

Synthesize the results of Experiment 2 and Experiment 3, participants with high self-disgust showed a selective attention to own face within 900ms and an attentional avoidance bias towards own name within 1000ms. Considering the timing of the occurrence of the attentional bias, a main focus of vigilance-avoidance theory is to provide a theoretical framework to explain the process (Derakshan, Eysenck, & Myers, 2007).

According to the theory, first, a vigilance stage occurs rapidly in which participants were sensitive to self-related information. Because the appearance of such information activates negative self-relevant schemas and related autobiographical information stored in long-term memory, the vigilance produces reactions indicative of self-disgust. After the vigilance stage, an avoidance stage followed in which high self-disgust sufferers utilized various avoidant cognitive biases to alleviate the sustaining high level of self-disgust.

Moreover, participants with high self-disgust performed a shorter reaction time in all tasks. Here we argued that this difference in reaction time was not simply explained by the lack of satisfice (Krosnick, 1991; Takahashi, 2017) in the low self-disgust group. A pre-priming effect may be helpful for interpretation. Participants were instructed before the experiments that the self-related information would appear in the experiments as the stimuli, which may arouse an intense self-consciousness in the high self-disgust group.

For the first time, the present study revealed the attentional bias toward self-related information in individuals with high self-disgust. These findings contribute in several ways to our understanding of the cognitive model of self-disgust.

References


