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Human-to-Human Contagion of Moral Disgust Based on Physical Contact

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People often refuse to touch objects that were once in contact with an immoral person because they find the idea of residue transfer disgusting. Previous research has revealed that objects in contact with immoral persons are often rejected because of disgust contagion. However, it is unclear whether the importance of contact with a disgusting presence also applies when moral disgust contaminates people. Thus, this study examined whether moral disgust can spread to a person without direct physical contact with a moral transgressor. Participants evaluated their impressions of individuals either in contact with or separated spatially from a moral transgressor. The results indicate that negative evaluations were significant only for individuals who had direct contact with moral transgressors. This suggests that physical contact is essential for the transmission of moral disgust. Although further research is needed to confirm the human-to-human contagion system, this study offers a significant step toward understanding the mechanisms of moral disgust contagion.

Keywords
disgust, psychological contagion, behavioral immune system, law of contagion

Introduction

Most individuals refrain from touching objects that elicit disgust. For example, people may feel disgusted and nauseated when gross-looking insects or other people's bodily fluids come close to their faces or mouths. Similarly, individuals may refuse to eat food once in contact with a cockroach or another person's mouth because they find it disgusting. Even if the food is heated thoroughly again, its disgusting nature will not change. Thus, disgusting things spoil another object through mere physical contact (Hejmadi et al., 2004).

This disgust contagion depends on contact with disgusting objects and transfers disgust (Rozin et al., 2009). A previous study contended that the behavioral immune system causes a psychological contagion of disgust to avoid pathogens (Schaller & Park, 2011). This system detects perceptual cues that indicate pathogens (e.g., gross-looking noxious odors and disfiguring blemishes). The behavioral immune system facilitates the avoidance of pathogens before an object eliciting disgust comes into contact with the body.

Notably, objects that are neither gross-looking nor visibly contaminated can also transfer disgust to others through mere physical contact. One such example is a morally disgusting object. Rozin et al. (1989) reported that many participants rejected clothes worn by a vicious person because they felt that the residue of the person's spirit remained on the clothes. This indicates that although moral transgressors are entirely different from typically disgusting objects and are not visibly contaminated, clothing in contact with an immoral person is illogically considered disgusting and should be avoided as a carrier of infectious pathogens. The behavioral immune system provides a reasonable explanation for such illogical emotional responses and behaviors from an evolutionary psychological perspective.

A previous study on disgust contagion without material dirt indicated that moral transgressors may contaminate humans. For example, Ikeda and Yamada (2019) reported that participants had an unpleasant impression of a person who shook hands with a murderer. In addition, participants were slower to respond to a handshake requested by a person who shook hands with the murderer than to a handshake requested by a person who shook hands with a businessperson. These findings suggest that moral disgust contagion can be transmitted via physical contact.

To the best of our knowledge, no studies have examined whether direct physical contact with a source of moral disgust is essential for transmitting psychological residues to humans. Generally, physical contact is not necessary for sharing morality with others. In line with this, previous studies have reported that moral disgust contagion between objects and humans occurs without physical contact (Kim & Kim, 2011; Stavrova et al., 2016). Considering these findings, although the behavioral immune system assumes that direct contact is essentially a perceptual cue for detecting pathogen transmission, this mechanism may not apply to moral disgust contagions. Therefore, this study investigates whether moral disgust can spread to a person without direct physical contact with a moral transgressor, which we refer to as the "human-to-human contagion" of psychological residues. We hypothesized that participants would evaluate someone sharing the same space as a moral transgressor as someone in direct contact with a moral transgressor. We also used three sensitivity scales related to the function of the behavioral immune system and explored how individual differences in these scales were involved in the transmission of disgust.

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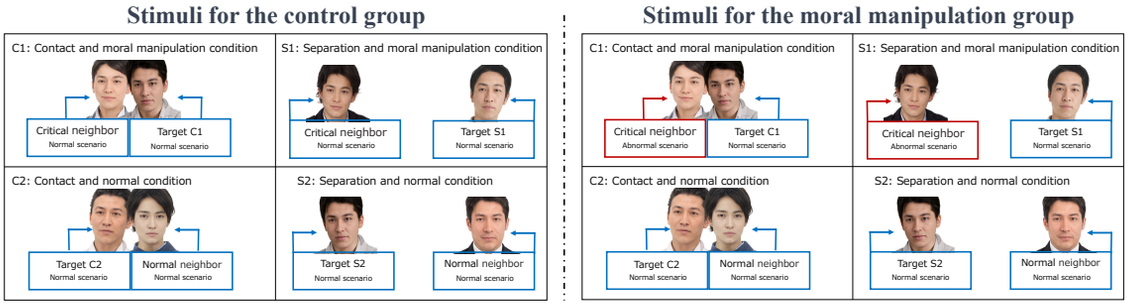

Figure 1. Examples of stimuli used in the experiment. C1 and C2 represent contact-type stimulus. S1 and S2 represent separation-type stimuli.

Methods

Participants

In total, 210 Japanese individuals were recruited via Yahoo! Crowdsourcing (https://crowdsourcing.yahoo.co.jp) for online experiment. The participants accessed the experimental form using their own devices. An attention-check question (ACQ) was inserted in the survey form to identify distracted and satisfied respondents. We excluded four participants who made a mistake on the ACQ: "291 + 33 − 319 = ?" from our analysis. Finally, data from 206 participants (142 men and 64 women) were included in the statistical analyses. The participants were aged 21–71 years (M = 45.66). These participants were divided into two groups: the control group (n = 103) and the moral manipulation group (n = 103).

We had to recruit different participants for each group and alternate the target's position in the stimuli within the group. Hence, we conducted four separate rounds for two groups (control vs. moral manipulation) with two target positions (left vs. right).

Materials

We used four images featuring two side-by-side AI-generated human figures (Figure 1). Participants evaluated one designated figure as the "target" for each image. The other figure, side by side with the target and not evaluated by the participants, was designated as the "neighbor." The AI human figures were all males with different faces and were generated using artificial intelligence from AC works (2019).

Each figure (target and neighbor) was assigned a short scenario involving a slice of daily human life to explain their personality. All targets were assigned to the normal scenario regardless of group (control vs. moral manipulation). In the control group, normal scenarios were assigned to all neighbors regardless of the scenario variable (normal vs. critical). In the moral manipulation group, neighbors were assigned to the normal and abnormal moral scenarios in the normal and critical conditions, respectively. In addition, the distance variables of contact (0-pixel interval between figures) and separation were introduced for pairs of figures. Two of them were "contact" stimuli, where the figures were placed in a way that their skin touched (Figure 1: C1 and C2). The other two were "separation" stimuli, where the figures maintained a sufficient distance so that no parts of their bodies touched (Figure 1: S1 and S2).

Two abnormal moral scenarios were used. The first scenario involved "eating familiar animals," where a man's dog was killed by car, and he decided to eat the dog out of curiosity. The second scenario involved "sexual contact with animals," where a male interacted inappropriately with his kitten (see Text 1 in 'Appendix 1 and 2' for details about scenario selection). These moral transgression scenarios were adapted from Tracy et al. (2019). The scenarios were selected because they are non-criminal but abnormal behaviors to remove the extraneous variable of avoiding the social risk of having a relationship with an explicit criminal, such as a murderer.

Procedure

First, all participants memorized eight male portraits (AI figures) and their personalities (inferred from the scenarios). Subsequently, the participants were presented with four images: two from the contact stimulus and two from the separation stimulus. Participants were asked to evaluate the likability and contact avoidance of the target on a seven-point Likert scale. The questionnaire on likability consisted of three items (good-bad, pleasant-unpleasant, like-dislike), with higher points indicating higher levels of disgust. The contact avoidance questionnaire consisted of items from the Contact Avoidance Scale (Kawano et al., 2013). After evaluating the four targets, all participants were asked to complete the Japanese version of the Disgust Scale-Revised (DS-R-J; Iwasa et al., 2018), which assesses disgust sensitivity; the Japanese version of the Perceived Vulnerability to Disease Scale (PVD; Fukukawa et al., 2014), which evaluates sensitivity to disease infection; and a moral disgust scale in the Three Domains of Disgust Scale (TDDS; Tybur et al., 2009), which assesses sensitivity to immorality.

Design & statistical analyses

The evaluation of targets had a two (distance of the neighbor: contact/separation) × two (scenario: normal/critical) design. The group (control vs. moral manipulation) and scenario (normal vs. critical), distance of the neighbor (contact vs. separation), and the interaction terms between group and scenario, scenario and distance, and distance and group, and all scales were inserted as fixed effects, whereas the participants' ID was inserted as a random effect. The response variable was the unpleasantness score for the target (the average of likability and contact avoidance). We ran a linear mixed model analysis using the lme4 package (Bates et al., 2015) and multiple comparisons using the emmeans package (Lenth, 2024) in R version 4.2.2 (R Core Team, 2022).

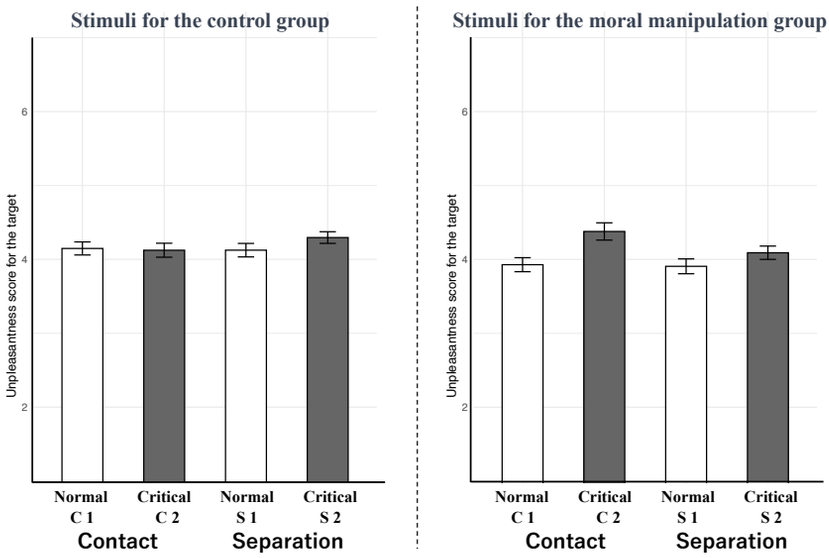

Figure 2. Results of the experiment. The bars in the left panel show the mean unpleasantness scores of the target in the control group. Those in the right panel show the mean unpleasantness score of the target in the moral manipulation group. Error bars represent SEs.

Results

The results of the analysis showed that the interaction term between group, scenario, and distance of the neighbor ($b = -0.4665$, $t = 3.052$, $p < .005$) and the interaction term between group and scenario were significant ($b = 0.4736$, $t = 4.385$, $p < .001$). In addition, the fixed effects of DS-R-J ($b = 0.2754$, $t = 4.174$, $p < .001$) and PVD ($b = 0.3913$, $t = 2.707$, $p = .007$) were significant (Figure 2). The multiple comparisons results showed that the experimental group's unpleasantness scores for the critical scenario and contact-type target were significantly higher than those for the normal scenario and contact-type target ($b = -5.86$, $p < .0001$), the normal scenario and separation-type target ($b = -6.15$, $p < .0001$), and the critical scenario and separation-type target ($b = 3.82$, $p < .005$). All other results and details, including the analysis code, are provided in the Supplementary Materials.

Discussion

This study investigated whether moral disgust contagion occurs not only through direct contact but also through spatial distance from a moral transgressor. The results revealed a significant interaction term between group, scenario, and distance of the neighbor. Furthermore, the results of multiple comparisons suggested that a target who had contact with a neighbor of abnormal morality was more disgusting than targets who maintained a sufficient distance from a neighbor of abnormal morality and who had contact with a neighbor of normal morality. These results indicate that participants have a more negative impression of a target who comes into contact with a moral transgressor and prefer not to touch the target's body, compared with targets in other conditions including separation. The present results do not support the human-to-human contagion of psychological residues without direct contact. The worsening evaluation of the target who had contact with a neighbor with abnormal morality in our study was consistent with previous findings (Ikeda & Yamada, 2019), which suggested that direct physical contact with a source of moral disgust was essential for transmitting psychological residues to humans. Thus, it is suggested that the visibility of contact is crucial for human-to-human contagion, and the transmission of moral disgust residue is different from pathogen infection, which spreads through the air from one human to another.

Focusing on the effect of individual sensitivity, the significant fixed effects of the DS-R-J and PVD emphasize that unpleasantness in this study was based on disgust sensitivity and perceived vulnerability to disease. This result is consistent with the theory of the behavioral immune system (Schaller & Park, 2011), which assumes that sensitivity to pathogen avoidance plays a key role in psychological disgust contagion.

Our findings may have an affinity with the law of contagion (Frazer, 1983). The law of contagion has been presented in anthropological literature as a general belief underlying diverse magical practices and rituals in traditional cultures. This law of thought implies that mutual contact transfers properties and essence. This transfer of properties or essence between a source and recipient persists for a long time (perhaps permanently) after physical contact. Moreover, previous studies have concluded that the law of contagion is an operative belief that influences people's reactions to disgusting objects in modern cultures (Rozin et al., 1989). Based on the law of contagion, the target's negative impression in the present study may be interpreted as follows: Immoral properties or essences are shared between the moral transgressor (the source) and the normal person (the recipient) through physical contact. Thus, in modern times, even with an advanced understanding of infections, people may still respond to magical contamination based on the laws of contagion that have been suggested for more than a century.

In summary, the present study indicates that human-to-human contagion does not occur without physical contact. Hence, we speculate that the moral disgust residue is treated as a physical entity that passes from body to body and not as a non-physical idea or microscopic pathogen.

Rejection based on the behavioral immune system, limited to tag-like rules, may not involve a scientific understanding of contamination or logical moral thinking. This study is the first to examine the detailed nature of the human-to-human contagion of moral disgust. Human-to-human contagion is also a topic of great significance in discussions on unfounded bias and discrimination. Further experiments are necessary to confirm the overall human-to-human contagion system and possible confounding variables. For example, it is possible that proximity per se, rather than contact, may have had a contagion effect through implied inter-figure communication or grouping. These possibilities would be addressed by manipulating the inter-figure distance in multiple levels, or by fixing it and manipulating the presence or absence of contact via postures. Regardless, the present study could be considered an essential step in this direction.

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Author contribution

AI and YY have significantly contributed to the development and design of the experiment. AI conducted the experiment. All authors listed analyzed the data and wrote the manuscript.

Ethical statement

This study was approved by the Research Ethics Committee of the Graduate School of Human-Environment Studies at Kyushu University on December 20, 2019 (ID:2019-026).

Data accessibility & program code

All datasets and R codes used in the analysis are available in the OSF repository (https://osf.io/sr7tn/).

Some information required to reproduce the reported methodology is not openly accessible to prevent copyright infringement. However, all stimuli and a list of all questions used in the experiments are available in the OSF repository in the 'stimuli' zip (https://osf.io/sr7tn/).

Supplementary material

The "Appendix 1 and 2" file below is available for reference in the OSF repository (https://osf.io/sr7tn/).

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