

The Frighteningness of Non-Disgusting Insects Angers Males More Than Females

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Participants ($N = 1351$) rated their hostility towards pictures of insects that were previously rated on frighteningness and disgustingness. The previous study revealed higher ratings on both characteristics by females. In the present study, disgustingness increased hostility more than frighteningness. Females were more hostile than males. However, frighteningness increased hostility more for the less disgusting insects, and this pattern was stronger for males than for females.

Previous research has examined the factors that evoke fear, anger, and disgust (e.g., Newhagen, 1998; Rozin, Lowery, Imada, & Haidt, 1999; Zurbriggen & Sturman, 2002). Also, much is known about how such emotions are recognized by means of facial expressions, body language, and situational cues (e.g., Kojima, 2001). Furthermore, emotions are certainly known to evoke behaviors, cognitions, and other emotions. The present study, however, examined how fear and disgust affect hostility, and how those effects interact with gender.

It is important to know how hostility is affected by both fear and disgust because of the implications for interpersonal aggression. Hostility often occurs in encounters with others that we perceive as different from ourselves. It is associated with racial bigotry and is invoked against the enemy in times of war. Hostility may be evoked by perceived difference because the difference is interpreted as threatening. But hostility towards other people is especially associated with differences in culture, and cultural differences are sometimes viewed with disgust. For example, Westerners often incorrectly believe that wearing a turban suggests that the wearer's hair is dirty which is viewed with disgust. Therefore, it is important to determine the relative potency of the emotions of fear and disgust for arousing hostility.

In order to obtain hostility ratings that would be not affected by social desirability bias, we chose to use insects as stimuli. We chose them because they are often viewed with fear and disgust, but it would be socially acceptable to express hostility towards them. However, when insects, like other potentially frightening stimuli, evoke either fear or disgust, they sometimes evoke the other emotion as well. For example, many insects, of which people often have phobias, are also viewed with disgust. Thus, such disgust evoking stimuli can also evoke fear in two ways. First, they might be frightening in themselves, either because of the irrational phobia, or because

they actually can cause harm. Secondly, the disgust reaction also has a component of fear of contamination (Rozin & Fallon, 1987).

Nevertheless, by obtaining frighteningness and disgustingness ratings on a large and diverse enough group of insects, it is possible to find examples of insects that can be categorized so that they vary independently on those two dimensions. For example, Davey (1994) found that wasps and bees evoke fear, but not disgust.

Method

Participants

Our participants were 1,351 respondents who participated in our web-based study from 9/13/05 to 6/18/06. The actual study can be found at <http://ryanlab.netfirms.com>. The majority of the participants were approximately 20 years old, and they reported that they were participating in the study as an assignment for school.

Materials

We had obtained frighteningness and disgustingness ratings of 43 different insects from college students in a previous study. These ratings were used to select eight insects, two of which were in each of the four categories resulting from crossing high and low frighteningness with high and low disgustingness. The eight insects were:

Low Disgustingness	Low Disgustingness	High Disgustingness	High Frighteningness
Low Frighteningness	High Frighteningness	Low Frighteningness	High Disgustingness



Procedure

The first web page invited the potential participant to participate in the study. It provided a brief informed consent statement to which the participant agreed by clicking on the "I'd like to participate" link. The next page gathered data on basic demographic characteristics, why the person was participating, some information on their experience with the Internet, and their expectation about enjoying the study.

The third page provided some instructions for the participant. It explained that they would see pictures of insects, and that they would rate how much they wanted to either kill, or at least get rid of each one. These instructions explained:

“The reason we say "or at least get rid of" is because some people might not want to kill the insect themselves because they might not want to risk touching it. Also, some people might consider killing it to violate a personal moral standard against killing living things. Therefore, your rating should reflect how much you would want to, in some way, get rid of the insect, regardless of whether you were willing to kill it yourself, have someone else kill it, or just get rid of it some way without actually killing it.”

These instructions were designed to maximize the possibility that we were getting a pure measure of hostility towards the insects, uncontaminated by either an avoidance reaction due to disgust, or by the social undesirability of killing any living thing that would occur in some religions and cultures.

The fourth page provided thumbnail pictures of all the insects so that the participant would have some idea of the range of frighteningness and disgustingness that they would encounter. This was done to enable them to make judgments on each insect sequentially, but to calibrate their judgments according to that range even on making their first judgment. The thumbnails were arranged in two rows of four, similar to how they are pictured above, except that the arrangement was randomly determined for each participant.

The following page presented each insect sequentially with a rating scale from zero to ten beneath it. This page contained all eight insects, but the participant was instructed to advance from insect to insect by clicking on a “next page” link, which then scrolled the page down to the next insect. The order in which the insects appeared on that page was also determined randomly for each participant. After the last insect, there was a “submit my ratings” button. When the participant clicked on that button they were thanked for participating and provided with the contact information of the first author.

Results

The data set was cleaned by removing responses that contained no ratings, and those that were obvious duplications. A response was considered a duplication if it came from the same IP address only a few seconds after the previous response and contained exactly the same demographic data and ratings.

A 3 factor ANOVA was used to analyze the responses with gender as a between subjects factor and both disgustingness and frighteningness as within subjects factors (see Fig. 1 and Table 1).

Figure 1. Mean Hostility Rating as a Function of the Gender of Participant and Disgustingness and Frighteningness of the Insect.

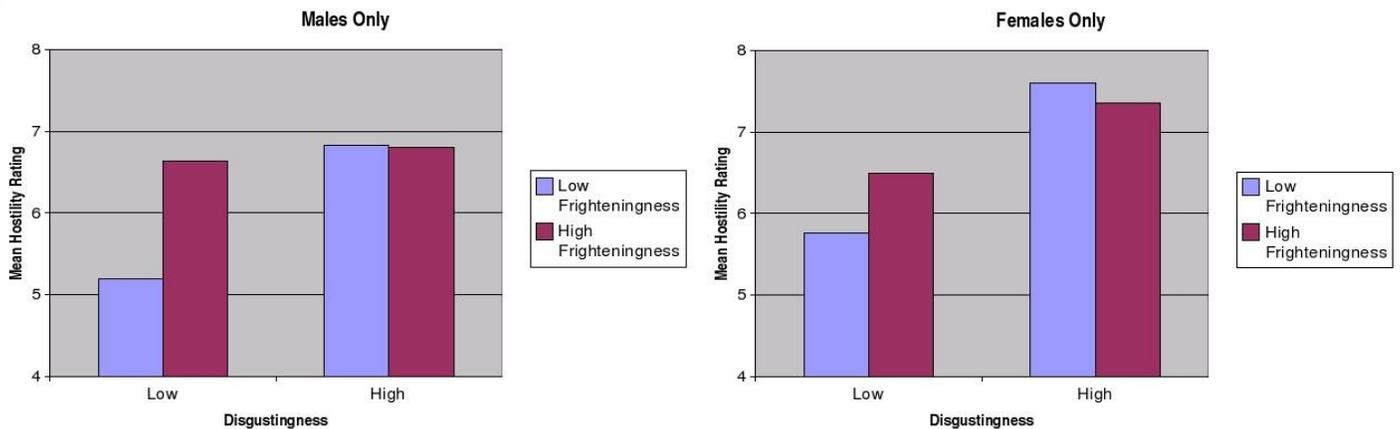


Table 1. Three way ANOVA for hostility rating with gender as a between subjects factor and frighteningness and disgustingness as within subjects factors.

Source	SS	df	MS	F	p	η^2
Gender	211	1	211	10.90	.001	.008
Error (Gender)	25012	1293	19.3			
Fear	256	1	256	48.92	<.001	.037
Fear * Gender	60	1	60	11.43	.001	.009
Error (Fear)	6757	1293	5.2			
Disgust	1401	1	1401	308.60	<.001	.193
Disgust * Gender	55	1	55	12.06	.001	.009
Error (Disgust)	5872	1293	4.5			
Fear * Disgust	410	1	410	100.57	<.001	.072
Fear * Disgust * Gender	18	1	18	4.31	.038	.003
Error (Fear * Disgust)	5265	1293	4.1			

There were main effects of both disgustingness and frighteningness, but disgustingness accounted for more than five times as much of the variance of hostility as did frighteningness ($\eta^2 = .193$ for disgustingness compared to $.037$ for frighteningness). There was also a main effect of gender. All of the two way interactions were significant. However, all of these main effects and interactions are qualified by the presence of a three way interaction. The three way interaction between gender, frighteningness, and disgustingness was driven by the presence of a two way interaction between gender and frighteningness for the low disgusting insects, $F(1, 1301) = 13.86$, $p < .001$, $\eta^2 = .011$, versus no such interaction for the high disgusting insects, $F(1, 1302) = 1.24$, $p > .05$.

Discussion

Disgustingness affected hostility more than did frighteningness. The females were more hostile than the males. However, for the low disgusting insects only, the males were more affected by frighteningness than were the females.

What could account for males being more affected by frighteningness for the low disgusting insects? The more highly frightening of those insects were wasps and bees. Davey (1994) found that females have greater disgust sensitivity than males but that wasps and bees did not elicit disgust along with fear, as did other stimuli to which people often had phobias. Given that our results show that disgust is an important factor in eliciting hostility, could it be that a better interpretation of the three way interaction in our study is that females are more hostile than males towards all the insects except for the wasps and bees? Figure 1 shows that to be the case. That interpretation is consistent with the higher disgust sensitivity of females leading to more hostility towards the more highly disgusting insects than wasps and bees. However, it is inconsistent with their greater hostility than males towards those insects that are low on both frighteningness and disgustingness.

Therefore, another possibility is that males were more hostile towards the wasps because of a culturally determined tendency to try to protect against the possible harm from such a stinging insect. This interpretation assumes that the wasps and bees were more readily identified by the males as threatening than the scorpion (the highly disgusting and highly frightening insect). Perhaps this occurred because wasp and bee stings are more common than scorpion stings in most cultures. Further research would be required to determine if this assumption is correct.

A more important question for further research, however, is the extent to which these results generalize from insects to people of other cultures. Greater cultural sensitivity could perhaps reduce the tendency towards the prejudicial view that the unfamiliar aspects of other cultures are disgusting. Such a change might reduce that portion of inter-cultural hostility produced by disgust. However, given the modern move towards greater globalization, reducing the feeling of being threatened by an unfamiliar culture might be more challenging. Our results show that, at least for our stimuli, men are induced to greater hostility towards even the non-disgusting stimuli if they find them threatening. Perhaps women have an important role to play in encouraging people to examine the rationality of such hostility.

References

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