Sex-Differences in Disease Avoidance 2

- Diana Fleischman 3
- University of Portsmouth, Portsmouth, UK AU1 4

Synonyms

Gender differences in disgust

Definition 7

- The degree to which men and women avoid cues 8
- that indicate contagious illness or that elicit the 9
- emotion of disgust. 10

Introduction

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Pathogens, the organisms and viruses that cause disease, are a central adaptive problem for almost all organisms. Pathogens, like bacteria, helminths (worms), viruses, and protozoa, take nutrients from their hosts, the larger multicellular organism. They also shelter in their host and often use the host's own cellular processes to make copies of themselves. While there are many bacteria, microorganisms, and even viruses that do not cause harm to their hosts, pathogens are defined as agents that cause disease and by definition undermine the nor- 22 mal functioning of the host organism.

Because of the constant threat of pathogens, 24 immune systems have evolved in many organ- 25 isms. Humans and other mammals are equipped 26 to fend off pathogens with a variety of different 27 cellular functions from creating molecules that 28 coat the pathogens (antibodies) to having special- 29 ized cells that absorb the pathogens (e.g., macro- 30 phages). However, launching immune attacks is 31 energetically costly. Thus, it is in the organism's 32 best interests to avoid being exploited by these 33 organisms in the first place. The way that organ- 34 isms prevent pathogens from triggering these 35 other physiological defense mechanisms is called 36 disease avoidance.

Disease Avoidance

Disease avoidance is widespread. Even organisms 39 as simple as worms can avoid toxins in their envi- 40 ronment. Rodents avoid diseased conspecifics and 41 even rats who are known to eat a wide variety of 42 foods display a "cannibalism taboo," avoiding eat- 43 ing other rats for the purposes of disease avoidance 44 (Hart 1990). Humans also engage in various dis- 45 ease avoidance strategies common in other species; 46 however, humans are the only species who demon- 47 strate disgust.

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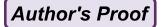
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Disgust

The central adaptive function of disgust is thought to be to reduce the risk of infection by motivating distance from cues of pathogens. While so-called pathogen or disease avoidance disgust is likely central to its function, disgust also deters mating with humans who do not show signs of good genetic endowment (Tybur et al. 2013). Disgust is measured in humans in a variety of different ways, through word-based questionnaires, through image-based ratings, through measuring disgust facial expressions, and through behavioral tests (for a review see Fleischman 2014).

Differences in Disgust and Disease Avoidance

Decades of research have shown that there are robust sex differences in disgust sensitivity, defined here as the tendency to experience disgust. Women have been shown to be more disgust sensitive than men using verbal measures and across all domains (Fleischman 2014). Specifically in the pathogen domain, women are more disgust sensitive when rating disgusting images (Curtis et al. 2004) and when engaging in disgusting tasks (e.g., eating a piece of feces-shaped fudge) (Rozin et al. 1999). As adults, women are more likely to develop obsessive-compulsive disorder, more likely to present with cleaning compulsions and contamination obsessions (Altemus et al. 2014). In nonclinical samples, women score higher than men on measures of OCD-related contamination fear (Mancini et al. 2001).

Sexual disgust has been shown to be very different between men and women. In studies using the established three domains of disgust scale, the largest sex difference is in the sexual domain (d (475) = 1.44 as compared to the pathogen domain (475) = 0.32 (Tybur et al. 2011). Women are less inclined toward casual sex and more disgusted by pornography than men (Koukounas and McCabe 1997). Finally, while sexually aroused men have been shown to have reduced disgust sensitivity, sexually aroused 91 women do not always show this effect and may 92 even show increased pathogen disgust sensitivity 93 (for a review, see Fleischman 2014).

Functional Reasons for Sex Differences in Disgust Sensitivity

Compared to men, women have faced unique 97 circumstances over evolutionary history that 98 may have led to heighted pathogen disgust sensi- 99 tivity. Women show changes in immunity across 100 the menstrual cycle and as a function of pregnancy 101 that make them vulnerable to disease. Women also 102 must protect children and infants who are vulner- 103 able from disease, perhaps making pathogen dis- 104 sensitivity more important (Curtis 105 et al. 2004). Finally, women are uniquely able to 106 pass on sexually transmitted and other infections 107 to their offspring during pregnancy, birth, and 108 lactation (Fleischman Madkan 109 2014; et al. 2006). Men's greater propensity for risk 110 taking more generally might also be contributing 111 factor to their relatively lower disgust sensitivity. 112

There are several adaptive reasons why women 113 might have heightened sexual disgust. Women 114 can have fewer offspring than men and have a 115 greater burden of parental investment. Thus, they 116 have less to gain from engaging in promiscuous 117 sex. If sexual disgust serves to prevent one from 118 engaging in sexual activity with someone who is 119 not genetically fit, men have less to lose and thus 120 lower disgust sensitivity in this domain. Anatom- 121 ical differences between men and women lead to 122 large differences in rate of infection and disease 123 burden for sexually transmitted disease. Women 124 have a greater area of mucous membranes and 125 experience more damage during intercourse. In 126 women, the fallopian tubes open into a central 127 pelvic cavity making them much more likely to 128 get systemic infection from bacteria that are sex- 129 ually transmitted. Women with a sexually trans- 130 mitted infection are much more likely to die or 131 become sterile (Madkan et al. 2006).

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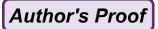
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Conclusion 133

Selection pressure has acted differently on men 134 and women with regard to disease avoidance. 135 Disgust, the uniquely human emotion thought to 136 have evolved specifically for disease avoidance, 137 tends to be greater in women than in men. In 138 particular, sexual disgust sensitivity is greater in 139 women. This is likely due to disease risk and 140 burden from sexually transmitted infection as 141 well as greater obligate parental investment. 142

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