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Sex-Differences in Disease Avoidance

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Synonyms

Gender differences in disgust

Definition

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

Introduction

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 normal functioning of the host organism.

Because of the constant threat of pathogens, immune systems have evolved in many organisms. Humans and other mammals are equipped to fend off pathogens with a variety of different cellular functions from creating molecules that coat the pathogens (antibodies) to having specialized cells that absorb the pathogens (e.g., macrophages). However, launching immune attacks is energetically costly. Thus, it is in the organism's best interests to avoid being exploited by these organisms in the first place. The way that organisms prevent pathogens from triggering these other physiological defense mechanisms is called disease avoidance.

Disease Avoidance

Disease avoidance is widespread. Even organisms as simple as worms can avoid toxins in their environment. Rodents avoid diseased conspecifics and even rats who are known to eat a wide variety of foods display a "cannibalism taboo," avoiding eating other rats for the purposes of disease avoidance (Hart 1990). Humans also engage in various disease avoidance strategies common in other species; however, humans are the only species who demonstrate disgust.

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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 women do not always show this effect and may even show increased pathogen disgust sensitivity (for a review, see Fleischman 2014).

Functional Reasons for Sex Differences in Disgust Sensitivity

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

There are several adaptive reasons why women might have heightened sexual disgust. Women can have fewer offspring than men and have a greater burden of parental investment. Thus, they have less to gain from engaging in promiscuous sex. If sexual disgust serves to prevent one from engaging in sexual activity with someone who is not genetically fit, men have less to lose and thus lower disgust sensitivity in this domain. Anatomical differences between men and women lead to large differences in rate of infection and disease burden for sexually transmitted disease. Women have a greater area of mucous membranes and experience more damage during intercourse. In women, the fallopian tubes open into a central pelvic cavity making them much more likely to get systemic infection from bacteria that are sexually transmitted. Women with a sexually transmitted infection are much more likely to die or become sterile (Madkan et al. 2006).

Conclusion

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

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