

Ewwwww! UCLA anthropologist studies evolution's disgusting side

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Behind every wave of disgust that comes your way may be a biological imperative much greater than the urge to lose your lunch, according to a growing body of research by a UCLA anthropologist.

"The reason we experience disgust today is that the response protected our ancestors," said Dan Fessler, associate professor of anthropology and director of UCLA's Center for Behavior, Evolution, and Culture. "The emotion allowed our ancestors to survive long enough to produce offspring, who in turn passed the same sensitivities on to us."

Across a series of subtle and ingenious studies, Fessler has managed to illuminate the ways in which disgust may have served to protect our ancestors during such biologically precarious situations as pregnancy and to maximize the likelihood of our forbears' reproduction when they were at their most fertile.

Fessler's research also illustrates how the emotional response that helped our ancestors may not serve us as well today and may actually promote xenophobia, sexual prejudices and a range of other irrational reactions.

"We often respond to today's world with yesterday's adaptations," Fessler said. "That's why, for instance, we're more afraid of snakes than cars, even though we're much more likely to die today as a result of an encounter with a car than a reptile."

Fessler will present his findings on Friday, March 30, as part of a three-

day conference at UCLA on new research concerning emotions. The event, "Seven Dimensions of Emotion: Integrating Biological, Clinical and Cultural Perspectives on Fear, Disgust, Love, Grief, Anger, Empathy and Hope," which runs Friday through Sunday, March 30–April 1, will include 40 scholars from around the world. The conference will be held in Korn Hall at the UCLA Anderson School of Management and is sponsored by UCLA and the Foundation for Psychocultural Research.

Fessler's research helps shed light on why some body parts universally draw more "ewwws" than others. In one study, Fessler asked 400 participants to imagine 20 different transplant operations and to rate them according to the level of disgust they elicited.

Half of the transplant organs were appendages — like tongues and genitalia — that routinely come into direct contact with the outside world and are therefore more susceptible to infection and damage. The other half were located inside the body — like the spleen and heart — and much less under an individual's control, especially with regard to protecting from infection and damage.

"If disgust protected our ancestors from pathogens, the emotion would have had the most utility in protecting parts of the body that interact most with the environment such as appendages," Fessler said. "Our ancestors would not have enjoyed the same advantage from disgust reactions with regard to protecting internal organs. So they benefited from focusing disgust reactions on the parts of the body that are on the outside and interface with the world around us."

True to Fessler's theory, participants considered the idea of transplanting appendages more disgusting than the idea of transplanting internal organs. Tongues, genitalia and anuses ranked the most disgusting, while hips, kidneys and arteries turned the fewest stomachs.

"The disgust we feel when we consider individual body parts reflects an adaptive goal of avoiding the transfer of pathogens," Fessler said.

The same logic appears to be behind some of the queasiness experienced by women during the first trimester of pregnancy, when an infusion of hormones lowers the immune system to keep it from fighting the "foreign" genetic material taking shape in the womb. Because the consequences of infection are also greatest for the fetus during this period, Fessler reasoned that natural selection may have armed pregnant women with an emotional response that helped compensate for their suppressed immune system.

To test the theory, Fessler gathered 496 healthy pregnant women between the ages of 18 and 50 and had them consider 32 potentially stomach-turning scenarios, including "a 30-year-old man who seeks sexual relationships with 80-year-old women," "walking barefoot on concrete and step(ping) on an earthworm," "someone accidentally stick(ing) a fish hook through his finger" and "maggots on a piece of meat in an outdoor garbage pail."

But before asking the expecting women to rank how disgusting they found these scenarios, he asked a series of questions designed to determine whether they were experiencing morning sickness.

In keeping with Fessler's theory, women in their first trimester scored much higher across the board in disgust sensitivity than their counterparts in the second and third trimesters. But when Fessler controlled the study for morning sickness, the response only held for disgusting scenarios involving food, such as the maggot example.

"A lot of the diseases that are most dangerous are food-borne, but our ancestors could not afford to be picky all the time about what they ate," Fessler said. "Natural selection may have helped compensate for the

greater susceptibility to disease during this risky point in pregnancy by increasing the urge to be picky about food, however much additional foraging that required. That the sensitivity seems to lift as the risk of disease and infection diminish is consistent with the view of disgust as protection against pathogens."

Fessler's research also suggests that at least some xenophobia may have its roots in the same vulnerable trimester. Together with colleagues, he asked 206 healthy American pregnant women between the ages of 18 and 42 to read two essays — one obviously written by a foreigner critical of the United States and another by a patriotic American citizen. He then asked the pregnant women to rate how interested they were in meeting and working with the authors. Pregnant women in their first trimester were much less likely to express an interest in meeting the foreigner than those in their second and third trimesters.

"Since the need for assistance from any other human being increases with pregnancy, the response doesn't make sense unless you consider outsiders as carriers of disease and infection," he said. "We suspect that, around the world, cultures have discovered that an easy way to elicit prejudice toward outsiders is to associate them with illness. Because emotional reactions that protect against disease are elevated during the first trimester, xenophobia comes along for the ride and is similarly increased early in pregnancy."

Women also appear to feel increased disgust toward certain forms of sexual behavior during the time in their menstrual cycle when they are most likely to become pregnant. Fessler administered the same standardized disgust scale that he used with pregnant women to 307 women between the ages of 18 and 45. In addition to the scenario about sex between couples separated by great spans of age, the disgust scale included scenarios involving incest and bestiality. Around the time of ovulation, women consistently rated these sexual activities as more

disgusting than did women at other points in their menstrual cycle.

"Since women have been shown to be the most interested in sex and new experiences when they are the most fertile, their disgust reactions toward unusual forms of sexual behavior during ovulation don't make sense except when considered in the context of reproductive fitness," Fessler said. "These are sexual activities that either would not result in conception or — in the case of incest and sex with older people — were less likely to result in conception of healthy children, so women who were more disgusted by them during ovulation would be more likely to reproduce and to have healthy children."

Source: University of California - Los Angeles

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