Medical Xpress

Fear of holes may stem from evolutionary survival response

September 3 2013

Dr Geoff Cole

What do lotus flowers, soap bubbles, and aerated chocolate have in common? They may seem innocuous, even pleasant, but each of these items is a trigger for people who report suffering from trypophobia, or the fear of holes. For trypophobes, the sight of clusters of holes in various formations can cause intensely unpleasant visceral reactions.

New research from psychological scientists Geoff Cole and Arnold Wilkins of the University of Essex suggests that trypophobia may occur as a result of a specific visual feature also found among various poisonous animals. The findings are published in *Psychological Science*, a journal of the Association for Psychological Science.

"These findings suggest that there may be an ancient evolutionary part of the brain telling people that they are looking at a poisonous animal," says Cole.

Trypophobia is widely documented by sufferers on the Internet and, in one study, Cole and Wilkins found that about 16% of participants reported trypophobic reactions. Despite this, there has been little scientific investigation of the phenomenon, leading Cole to refer to trypophobia as "the most common phobia you have never heard of."

Cole and Wilkins, both vision scientists, wondered whether there might be a specific visual feature common to trypophobic objects.

They compared 76 images of trypophobic objects (obtained from a trypophobia website) with 76 control images of holes not associated with trypophobia. After standardizing various features of the images, the researchers found that the trypophobic objects had relatively high contrast energy at midrange spatial frequencies in comparison to the control images.

Why might this unique visual feature lead to such aversive reactions? One trypophobia sufferer provided Cole with a clue: He had seen an animal that caused him to experience a trypophobic reaction.

The animal in question, the blue-ringed octopus, is one of the most poisonous animals in the world, which led Cole to a "bit of a Eureka moment."

He and Wilkins analyzed images of various poisonous animals—including the blue-ringed octopus, deathstalker scorpion, king cobra snake, and other poisonous snakes and spiders—and found that they, too, tended to have relatively high contrast at midrange spatial frequencies.

In light of this, the researchers speculate that trypophobia may have an evolutionary basis—clusters of holes may be aversive because they happen to share a visual feature with animals that humans have learned to avoid as a matter of survival.

"We think that everyone has trypophobic tendencies even though they may not be aware of it," says Cole. "We found that people who don't have the phobia still rate trypophobic images as less comfortable to look at than other images."

In studies currently under way, Cole and Wilkins are exploring whether manipulating the spectral characteristics of images of everyday objects, like watches, leads people to prefer one object over another. They believe these experiments will shed light on just how ingrained trypophobic tendencies might be.

More information: pss.sagepub.com/content/early/ … /23/0956797613484937

Provided by Association for Psychological Science

Citation: Fear of holes may stem from evolutionary survival response (2013, September 3) retrieved 26 April 2024 from https://medicalxpress.com/news/2013-09-holes-stem-evolutionary-survival-response.html

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