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By Rachel Ehrenberg

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As horror-flick titles go, *Night of the Living Chaos* and *Rosemary's Nonlinearity* aren't the catchiest. But filmmakers know that chaos — the mathematical kind — is scary. Now scientists know it too.

Filmmakers use chaotic, unpredictable sounds to evoke particular emotions, say researchers who have assessed screams and other outbursts from more than 100 movies. The new findings, reported May 25 in *Biology Letters*, come as no surprise, but they do highlight an emerging if little-known area of study, says cognitive biologist W. Tecumseh Fitch of the University of Vienna in Austria, who was not involved in the study.

"The classic example would be a screaming baby on an airplane," says Fitch, "the kind you can't ignore and makes your life hell."

Cries are harder to ignore when they become irregular and chaotic, recent research suggests. Scientists think that these noises, uttered or roared when an animal is really worked up, have a crucial role in communication: They frantically demand attention.

By exploring the use of such dissonant, harsh sounds in film, scientists hope to get a better understanding of how fear is expressed, says study coauthor Daniel Blumstein of the University of California, Los Angeles.

"Potentially, there are universal rules of arousal and ways to communicate fear," says Blumstein, who typically studies screams in marmots, not starlets.

Blumstein and his coauthors acoustically analyzed 30-second cuts from more than 100 movies representing a broad array of genres. The movies included titles such as *Aliens*, *Goldfinger*, *Annie Hall*, *The Green Mile*, *Slumdog Millionaire*, *Titanic*, *Carrie*, *The Shining* and *Black Hawk Down*.

Not unexpectedly, the horror films had a lot of harsh and atonal screams. Dramatic films had sound tracks with fewer screams but a lot of abrupt changes in frequency. And adventure films, it turns out, had a surprising number of harsh male screams.

"Screams are basically chaos," Fitch says.

Filmmakers have long been deliberately distorting sounds for dramatic effect, says musicologist James Wierzbicki of the University of Sydney. In Hitchcock's classic *The Birds*, the only true avian sounds are heard near the beginning of the movie, in a pet shop. The calls of the demented, attacking birds were all electronically generated. A true, harsh scream "is not a trivial thing to do," Fitch says. In fact, capturing a realistic, blood-curdling cry is so difficult that filmmakers have used the very same one, now found on many websites, in more than 200 movies. Known as the Wilhelm scream, it is named for the character who first unleashed it in the 1953 western *The Charge at Feather River*.

#### **SUGGESTED READING :**

B. Bower. 2009. Newborn babies may cry in their mother tongues. *Science News* (Dec 5), 176: 14.

S. Milius. 2002. Ear for Killers: Seals discern foes' from neighbor-whales' calls. *Science News*, 162(Nov. 16): 308.

#### **CITATIONS & REFERENCES :**

Blumstein, D.T., R. Davitian and P.D. Kaye. 2010. Do film soundtracks contain nonlinear analogues to influence emotion? *Biology Letters*, online May 25. Doi:10.1098/rsbl.2010.0333