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A true shampoo bounce

Head for the bathroom, grab some shampoo and place a metal baking sheet on a slope in the tub. This experiment will be a bit messy.

Now pour a very thin stream of shampoo onto that sheet from a height of about 20 centimetres. A cascade of arching jets will leap up and down the slope, getting progressively smaller.

Congratulations, you have just recreated the Kaye effect, an odd physical phenomenon named after the British engineer who first observed it more than 40 years ago.

Unfortunately, your eyes weren't fast enough to see the shampoo bounces, which are over in an instant.

But the photograph here, with exposure times of a mere 150 microseconds, puts together a half dozen colour-coded images of the jets.

Dutch researchers at the University of Twente used a high-speed video camera to capture the photo, and to finally figure out the physics behind the Kaye effect.

Their findings are posted on the www.arxiv.org website, used by physicists for rapid dissemination before paper publication.

Lead researcher Michel Versluis says this weird behaviour may be taking place regularly in kitchens and bathrooms.

Although originally discovered in obscure organic liquids, the Kaye effect can theoretically happen with shampoo, yogurt, ketchup, liquid soap and non-drip paints.

All these liquids display what is known as shear-thinning behaviour, meaning that the liquid gets less viscous as it flows. When the shampoo is poured, a thin layer of shear-thinned liquid forms, providing the lubrication necessary for the jets.

So far the Kaye effect is just a laboratory curiosity. But the researchers noticed that a laser beam shone into the descending stream stayed inside throughout the bounces.

"You can transport light this way," says Versluis.

Kids are a bummer

Ignore those "don't cook with cheese" ads on television as advice on how to get your grown-up kids to leave home: Even if they go, it won't help your parental depression one little bit.

Two American sociologists have found that parents of all varieties report significantly higher levels of depression than adults who don't have children. This is true whether the parents were married or unmarried, whether the children were adopted, stepchildren, minors or adults, and whether they were still at home or had moved out.

The highest levels of depression, however, were reported for parents of adult children and parents who didn't have custody of their minor children.

The researchers theorize that parents remain involved in the lives of their adult children - even if the kids have moved out - and this continued concern exacts an emotional toll.

"Parents have more to worry about than other people do, and that worry does not diminish over time," says Robin Simon, a professor at Florida State University.

Simon and colleague Ranae Evenson of Vanderbilt University analyzed data from the National Survey of Families and Households and reported their findings in the *Journal of Health and Social Behavior*, published by the American Sociological Association.

The two researchers weren't surprised that the emotional costs of parenting can outweigh the psychological benefits for many people. But they expressed shock at finding that the depression impact of being a parent was the same for men and women.

Family life researchers had generally assumed that parenthood matters more to the emotional well being of women, Simon said.

"Parenthood is not the way it is in TV commercials," she said.

Wired for emotion

Few who have watched one of the greats conducting an orchestra - Toscanini, von Karajan, Levine - would doubt that a conductor's baton thrusts and head tosses can add urgency and drama to the actual notes being played.

But can science measure such physiological responses? And does it matter whether you're at a live performance or experiencing high-quality digital audio and video from a DVD?

This month, researchers from McGill University tried to answer those questions by wiring up the conductor, musicians and audience members at a performance of the Boston Symphony Orchestra.

Maestro Keith Lockhart wore a tight-fitting shirt studded with sensors, which measured heart rate, muscle movement and other physiological responses.

Similar measurements were made from five musicians and 50 members of the audience, including children present for a Boston Pops performance that included an interpretation of Dr. Seuss's *Green Eggs and Ham*.

McGill's Daniel Levitin, a musician and a cognitive neuroscientist, said the researchers were seeking a window into the workings of the brain.

"If the conductor is conveying excitement, we expect to see that in the musicians and a second or two later in the audience," Levitin told an Associated Press reporter in Boston.

An audience in Montreal, similarly wired up, will view a high-definition video of the performance.

Months of data analysis then lie ahead before the researchers have any answers.

Looking at the experiment as a musician, Lockhart noted that people don't normally have incredibly tragic responses to Dr. Seuss. But a Puccini opera, he said, now there's something that takes your breath away.

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Each week a columnist identified only as Sybil investigates the point of seemingly pointless research on the news @ nature website. She has found valuable science behind hearing-challenged budgies, T-shirts advertising beer, and a U of T grad's computer program that judges whether two spoken words sound alike.

567511-394522.jpg | Michel Versluis, University of Twente A half-dozen images captured with high-speed video show how shampoo streams can bounce. Could light be transported this way? | ;

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