



Researchers Show Parachutes Don't Work, But There's A Catch

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A study found that parachutes were no more effective than empty backpacks at protecting jumpers from aircraft. There was just one catch.

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Research published in a major medical journal concludes that a parachute is no more effective than an empty backpack at protecting you from harm if you have to jump from an aircraft.

But before you leap to any rash conclusions, you had better hear the whole story.

The gold standard for medical research is a study that randomly assigns volunteers to try an intervention or to go without one and be part of a control group.

For some reason, nobody has ever done a randomized controlled trial of parachutes. In fact, medical researchers often use the parachute example when they argue they don't need to do a study because they're so sure they already know something works.

Cardiologist Robert Yeh, an associate professor at Harvard Medical School and attending physician at Beth Israel Deaconess Medical Center, got a wicked idea one day. He and his colleagues would actually attempt the parachute study to make a few choice points about the potential pitfalls of research shortcuts.

They started by talking to their seatmates on airliners.

"We'd strike up a conversation and say, 'Would you be willing to be randomized in a study where you had a 50 percent chance of jumping out of this airplane with — versus without — a parachute?'" Yeh says.

Only a few people said yes to this outrageous invitation, and they were excluded for reasons of questionable mental health.

The scientists had much better success asking members of their own research teams from Harvard, University of California, Los Angeles (Where Yeh's brother is a surgery professor), and University of Michigan (where a buddy works) about volunteering to participate in the experiment on other aircraft.

In all, 23 people agreed to be randomly given either a backpack or a parachute and then to jump from a biplane on Martha's Vineyard in Massachusetts or from a helicopter in Michigan.



Daredevil Joanne Healy, one of the study participants, leaps from an airplane. (Spoiler alert: She's wearing a backpack.) *Courtesy of Robert Yeh*

Relying on two locations and only two kinds of aircraft gave the researchers quite a skewed sample. But this sort of problem crops up frequently in studies, which was part of the point Yeh and his team were trying to make.

Still, photos taken during the experiment show the volunteers were only too happy to take part. "I think people are laughing all of the way to the ground," Yeh says.

Oh, there's one important detail here. The drop in the study was about 2 feet total, because the biplane and helicopter were parked.

Nobody suffered any injuries. Surprise, surprise. So it's technically true that parachutes offered no better protection for these jumpers than the backpacks.

"But, of course, that is a ludicrous result," Yeh says. "The real answer is that that trial did not show a benefit because of the types of patients who were enrolled."

If they had enrolled people at high risk for injury, that is people in *flying* aircraft, the results would have been quite different (not to mention unethical).

But something like this happens in everyday medical research. It's far too easy for scientists who have already anticipated the outcome of their research to cherry-pick patients and circumstances to achieve the results they expect to see. This research paper carried that idea to the ridiculous extreme.

The [study's findings](#) were published in the traditionally lighthearted Christmas issue of the medical journal, *BMJ*.

"It's a little bit of a parable, to say we have to look at the fine print, we have to understand the context in which research is designed and conducted to really properly interpret the results," Yeh says. Scientists often

read just the conclusion of a study and then draw their own conclusions that are far more sweeping than are justified by the actual findings.

This is a real problem in science.

"I know that people often don't look detailed enough into what is being investigated to know how to interpret the results of a trial," says [Cecile Janssens](#), an epidemiology professor at Emory University.

Janssens was delighted to come across the paper on Twitter. She says like a lot of research, its results are accurate as far as they go, but "the results can only be generalized to situations where people jump out of an aircraft within a few feet above the ground."

She plans to give this paper to her students with a straight face and see how long it takes for them to get the deeper points about scientific methodology buried in this absurd experiment.

"It will be unforgettable," she says — far better than assigning a straight-ahead scientific study.

Yeh is pleased to see that the fun he had with his colleagues is turning into a teaching tool. He also savors some of the more subtle lessons buried in the paper.

For example, the scientists attempted to submit it to a government registry of research studies, which is required for many studies involving human subjects. They chose one in Sri Lanka to reduce the risk that it would be discovered in advance, spoiling the joke. It was rejected.

"They thought that a trial conducted in this manner could not lead to scientifically valid evidence," he said.

"They're right!" he adds with a laugh.

In fact, the paper acknowledges that the research team members cracked themselves up so much that "all authors suffered substantial abdominal discomfort from laughter."

"Our greatest accomplishment from all of this was we felt very good that we were able to cite Sir Isaac Newton in the paper," he says. They referred to Newton's classic 1687 paper establishing the law of gravity.

Yes, gravity is a law. Mess with it at your own risk.