

Christmas cracker pulling: How to send everyone home a winner

December 15 2014

According to experts' statistical analyses, if you're expecting 10 guests for dinner on Christmas day, 15 crackers—those festive cardboard tubes filled with a one-size-fits-no-one paper hat, a small toy, and a groan-inducing joke—should be enough to send everyone home happy. The experts came to their estimation by simulating 10,000 parties, with guest numbers ranging from 2 to 50. Their results are published in *Significance*.

In the traditional approach, all dinner guests sit around the table, cross arms, and pull [crackers](#) with their two immediate neighbors. In this approach, each person has a 25% chance of winning zero crackers, so there are clearly inefficiencies in the system.

A better approach would be to use a system that starts by pairing up individuals and having each pair pull a single cracker. (For odd-sized groups one individual will have to stir the gravy or check the goose while this takes place.) Exactly $[N/2]$ crackers are used in this round, with the same number of winners and losers.

Those who have not yet won continue as before until only a single individual remains. That individual then pulls a cracker with themselves and we are done.

More information: Clifford, D., Lê Cao, K.-A. and Huang, B. E. (2014), A statistician's Christmas party. *Significance*, 11: 44-47. [DOI: 10.1111/j.1740-9713.2014.00784.x](https://doi.org/10.1111/j.1740-9713.2014.00784.x)

Provided by Wiley

Citation: Christmas cracker pulling: How to send everyone home a winner (2014, December 15)
retrieved 26 April 2024 from

<https://phys.org/news/2014-12-christmas-cracker-home-winner.html>

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