Christmas cracker pulling: How to send everyone home a winner

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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

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