Probability Stories

I The Coinciding Birthday Parties (Huff 1959)

You have (, let's say,) 24 friends who give parties on their birthdays. What are the chances that two or more parties fall on the same day? This is a (fine) instance of the difficulty of judging probabilities by common sense. The first birthday can be any day. There is 1/365 that the second will come on the same day or 364/365 that it will not. That the third will coincide with either of the first two is two chances in 365 or 363 in 365 that it will not. So multiply 364/365 by 363/365 and so on to 342/ 365. It comes out .46, or slightly less than an even chance that the birthdays won't coincide. For 26 birthdays, which comes to one every other week of the year, it's .37 or almost 2 to 1 odds that at least two birthdays will fall on the same day. Even-money bets on this would be highly profitable in the long run, or even the fairly short run, and shouldn't be hard to get, since the conclusion we've proved rather outrages common sense. You might agree to settle the bet by opening "Who's Who" at random and taking the first 26 birth dates given. (Break even is at 23) Curve looks like so: https://en.wikipedia.org/wiki/Birthday_problem

II The addition non-principle

This leads to a non-principle of probability - the addition non-principle. It is not true that: The chance of at least one of two or more events occuring equals the sum of the chances that each event occurs. Please never use this hideous illogical but tempting non-principle.

http://web.stonehill.edu/compsci/schechter/sassds/prob.html

Huff, Darrell. 1959. ***How to Take a Chance***. London: V. Gollancz, 1960.