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## In Lotteries, Lucky Numbers Will Only Win You Less

Popular picks are no more likely to hit than others—and mean more potential winners when they do



Big lottery jackpots tend to draw in infrequent players, many of whom might choose numbers with personal meaning. Such an approach can lead to lower eventual prizes because of an increased number of winners. *PHOTO: RANDALL BENTON/ASSOCIATED PRESS*

By **JO CRAVEN MCGINTY**

Oct. 9, 2015 5:30 a.m. ET

It goes without saying the chance of winning the lottery is minuscule. But if you play the numbers, you should know that certain tactics commonly used to make picks reduce the likelihood of collecting the maximum payout.

Grab a pencil, and we'll try it out.

Let's say a \$1 lottery ticket allows you to choose six numbers between 1 and 75. Write down your choices and make a mental note regarding the significance of each one.

If you are like many people, you picked numbers with personal meaning. Perhaps you jotted down a birthday or an anniversary. Possibly you threw in a 7 or some other lucky number. Or maybe you went for a pattern like 1, 2, 3, 4, 5, 6.

Those numbers may feel more satisfying than a computer-generated selection, but they are no more likely to win.

And they are less likely to give you that “I’m quitting and moving to Maui” payday you may dream about if other people, using similar strategies, choose the same numbers and get a cut of the jackpot.

“You can spend your whole life playing 1, 2, 3, 4, 5, 6, and you’ll have the same chance of winning as someone who played 1, 12, 25, 36, 38, 41,” said Philip J. Cook, co-author of “Selling Hope: State Lotteries in America” and a professor of public policy, economics and sociology at Duke University. “It does not matter in terms of winning. It matters in terms of dividing the pot.”

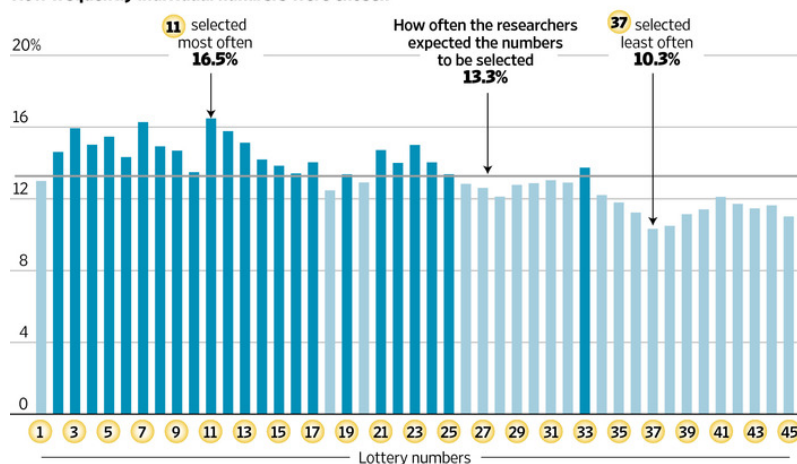
Any combination of numbers is equally likely to win, but people tend to choose some numbers and combinations more frequently than others, increasing the likelihood that different people will end up with the same picks.

The effect was documented recently by researchers in the Netherlands and the U.K. who examined more than 5 million number combinations played in the Dutch Lotto during 2½ years to test the players’ preferences.

### Random Selection

A study of 5 million tickets in the Dutch Lotto found that players often picked numbers that had personal meaning, formed patterns or were primed in memory, leaving an unexpectedly uneven distribution.

#### How frequently individual numbers were chosen



Sources: Rogier J.D. Potter van Loon and Tong V. Wang (Erasmus University, Rotterdam); Martijn J. van den Assem (VU University, Amsterdam)  
Dennie van Dolder (University of Nottingham)

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In the Dutch game, players select six numbers between 1 and 45 plus one of six colors. The chances of winning the jackpot, or a share of it, are about 1 in 49 million. The data used by the researchers included the ticket holders’ birth date and four digits of their postal code.

If the players had picked randomly, the researchers expected each number to be chosen 13.3% of the time. But that proportion was exceeded

by all personal numbers, and day of birth, which was chosen 21.03% of the time, was the most popular.

“These are numbers that follow you through life,” said Tong V. Wang, a doctoral student at Erasmus University in Rotterdam and one of the researchers. “You might

pick these numbers more frequently. That’s indeed what we find.”

Other patterns also emerged. Players preferred numbers that appeared in the middle of the lottery form to those on the edges. Visual patterns, such as strings of numbers that ran diagonally across the form, were popular, as were mathematical patterns—including 1, 2, 3, 4, 5, 6, which was the third most popular combination based on the number of players who chose it. Within the period the researchers studied, it was selected 1,944 times by 670 different people.

The researchers found numbers that were “primed” in the players’ memory also were chosen frequently. For example, the six numbers that appear in the Dutch game’s logo—2, 6, 15, 24, 37, 45—were chosen 2,873 times by 650 different players.

While choosing particular numbers doesn’t improve a player’s chances of winning the lottery, and could reduce the amount of money a winner collects, all modern lottery games allow, and encourage, players to make their own picks.

“It distracts people from the pure chance element,” Dr. Cook said. “People act as if they can improve their odds of winning through their insight or technique, but there is no way to improve your odds if the game is, as advertised, purely random.”

Winning any amount may satisfy some players. But if the aim is to vie for the maximum payout, the best strategy is to let the lottery’s computer generate a random combination of numbers that is less likely to be duplicated by lots of other players.



The Mega Millions lottery jackpot grew to an estimated \$425 million late in 2013, prompting a rush of ticket-buying.

*PHOTO: JONATHAN ALCORN/REUTERS*

“An important determinant in playing is the size of the jackpot,” said Martijn J. van den Assem, a professor of finance at the University of Amsterdam and another of the researchers. “If they knew they would have to share, it will become less appealing.”

And sometimes, the effect is extreme.

The combination 4, 8, 15, 16, 23, 42, a recurring string that appeared in the American

television series “Lost,” was played more than any other in the Dutch study, a total of 3,190 times by 656 people.

It’s popular in the U.S. as well—and in 2011, four of the numbers hit in the Mega Millions lottery. More than 40,000 people had played the winning combination, and each one walked away with a slice of the multimillion-dollar prize.

It amounted to \$150 per person.

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MORE NUMBERS (SOME LUCKY)

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- Check out past columns (<http://www.wsj.com/news/types/the-numbers>)
- Follow The Numbers on Twitter (<https://twitter.com/WSJnumbers>)

But when Julie Leach of Michigan won \$310.5 million in the Powerball lottery on Sept. 30, she was the only person playing the numbers 21, 39, 40, 55, 59 and

Powerball number 17.

That winning combination was an “easy pick” randomly generated by the computer at her local Shell gas station. The numbers were meaningless. But they were worth a fortune.

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