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Bringing down the House: Researchers say chaos theory can predict a dice roll (but the maths required is so exact it is still 'effectively random')

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PUBLISHED: 11:41 GMT, 13 September 2012 | **UPDATED:** 13:04 GMT, 13 September 2012

It is meant to be all down to chance.

But researchers from Poland believe they can predict the throw of a dice, using chaos theory and mathematics to figure out where the dice will land - and crucially, which side is facing up.

Naturally, the researchers, at the Technical University of Lodz, need to know some of the starting variables, such as the friction of the table, air conditions and the acceleration of gravity.

If the team can translate their theories into a working, portable machine, then the houses at Vegas, Monte Carlo, and Atlantic City may be in trouble.



Predictable? Researchers believe that Chaos Theory could give the answer to a roll of the dice before it lands

CHAOS THEORY: SIMPLIFIED

Chaos theory, in the simplest terms, is a branch of mathematics that looks at highly complex systems, such as weather systems, crowd control, or the moment of molecules, whose behavior is highly sensitive to slight changes in conditions.

Just small alterations can give rise to strikingly great consequences - with the oft-quoted example being that 'a butterfly flapping its wings in England can cause a thunderstorm in Australia'.

The researchers created a three-dimensional model of the die throw and compared the theoretical results to experimental observations.

By using a high-speed camera to track the die's movement as it is thrown and bounces, they found the probability of the die landing on the face that is the lowest one at the beginning is larger than the probability of landing on any other face.

This suggests that the toss of a symmetrical die is not a perfectly random action.



The end of dice games? If future machines could accurately guess where the die will land, it could spell trouble for the casinos

'Theoretically the die throw is predictable, but the accuracy required for determining the initial position is so high that practically it approximates a random process,' said Marcin Kapitaniak, a Ph.D. student at the University of Aberdeen, Scotland.

'Only a good magician can throw the die in the way to obtain the desired result.'

These results suggest that randomness in mechanical systems is connected with discontinuity as the die bounces.

'When the die bounces on the table, it is more difficult to predict the result than in the case of a die landing on the soft surface,' Kapitaniak said.

The article describing the findings has been accepted for publication in the publication Chaos.

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not good enough;; when I,m digging a hole, I need to be spot on.

- [joe](#) , leeds, 15/9/2012 07:48

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The whole premise of chaos theory is that you cannot predict anything, therefore it would be foolish to use such a theory to demonstrate any kind of definitive rule.

- [bluesman](#) , Redditch, 15/9/2012 04:04

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Chaos is just the inability to know everything and therefore a lack of knowledge, which is not a mathematical issue, but a practice one. Probability and potential outcomes just tease us humans like a ball of wool teases a kitten. Everything is always random. To be looking at an article about Polish scientists suggesting that the rolling of dice can be predicted was never likely to ever happen, ever, in the whole life time of the universe. Yet it did. The actual likelihood of me typing these words was a certainty having done it, but infinitately improbable to predict by someone last week. The occurrence of anything always suggests that it can happen again. We are here so there are definately other people somewhere in the Universe because nothing can be so impossible as to have 9 billion beings in one place and there be none others in such a vast universe. This is the probability of concept. Rolling dice and the chance of coins landing on their edges are the probability of risk.

- [Jetty](#) , London, United Kingdom, 14/9/2012 16:50

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Nothing in real life is random, as it effectively influenced by something else. - James , Colwyn Bay, 13/9/2012 19:23 ===== That's right if everything has a source, then there must be a first source, a source than cannot be moved itself, a source that isn't influenced, a sold rock which the universe has its foundation in. Some people call this first source God. There is a plan, a design, that moves us through life, pre-destination, set in motion by the first source.

- [Dr Teddy Robbear](#) , Edinburgh, United Kingdom, 14/9/2012 00:29

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::::: Nothing in real life is random, as it effectively influenced by something else ::::: I think they just confirmed what everybody knew anyway. If conditions are *exactly* the same, the dice will do what you expect. Probably. Give or take

- [Go Einstein](#) , Auckland NZ, 14/9/2012 00:23

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The cube of the root of the square is the mathematical secret to success here,calculated precisely is normally spot on.

- [Brains](#) , Tracy Island, United Kingdom, 13/9/2012 23:41

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Randomness + fixed variable of 1 die with 6 sides, 2 die of 6 sides makes up 12 X 12 for 6 times to get all possible results. 1 out of 6 X 1 out of 6 since only 1 face per die can be up yet the total can never exceed 12. An optimist sees another possibility here, 5 X 1 die, times, 5 X the other die will NOT end up on top. This means 100 divided by 6, or 16,66% is actual odds being dealt with, other 84.34% is eliminated with every throw. This experiment has validity if scientists can pre-determine total sum with any given toss of a pair of dice. Nr 5 is a combo of 1 + 4, or 2 + 3, means 16.66% factor is upped to 33% reliable chance level. Simply put, 2 separate numbers have to surface, which combo of 2 numbers will produce a sum with most probability of actually coming up would be 5. 6 + 1, 5 + 2, 4 +3 are better odds, if. That's why odds makers at casino's make 7, 11, crapping out snake eye's, heavy bet numbers, house always wins. How many casino's allow 5 to be played?

- [pietschka liika](#) , scania, Denmark, 13/9/2012 23:27

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I will give you odds of Six to One that they can't !

- [blake_jake](#) , newport, 13/9/2012 23:19

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Perhaps if you were the craps shooter as well so could regulate your throws

- [maildog1](#) , warrington, United Kingdom, 13/9/2012 20:44

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Nothing in real life is random, as it effectively influenced by something else.

- [James](#) , Colwyn Bay, 13/9/2012 19:23

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