

Cause and effect: chaos theory

Business



“ If there were ever a more field so closely related to cause and effect, it would be chaos theory.” -Craig Allen, Meteorologist for 30 Years (Cook) The relatively new but explosive mathematics mentioned above is known today as Chaos Theory. Chaos simply is the simple formula that explains the relativity of seemingly random bits of data. The field itself is technically a math, but its application stretches far into fields such as science, physics, weather patterns, biology, space exploration, quantum chaos and even economics.

One of its most famous examples is called The Butterfly Effect; wherein a butterfly flapping its wings in Brazil leads to a tsunami in Vietnam years later. In this example, one can see what Mr. Allen was talking about when he mentioned cause and effect. The cause was the wings flapping, and a thousand effects later, a tsunami or a tornado resulted. Through the years of exhaustive research and innovative breakthroughs, Chaos Theory can be extremely complex, yet still visible in everyday life, and cause and effect is the bridge to understanding in this field. As stated, the term ‘ chaotic behavior’ used loosely is essentially all of the numbers involved on a factor called sensitive dependence on initial conditions.

To go into depth, how important a series of events can be altered by just a millionth of a decimal. Edward Lorenz is the noted pioneer in this idea, as he stated, “ Predictability: Does the flap of a butterfly’s wings in Brazil set off a tornado in Texas?” (Lorenz). Lorenz was a meteorologist who experimented with the way weather was predicted. Unbeknown to many, weather forecast involves thousands of calculations, and at the time it was normal for decimals in these equations to only go up to the 6th (millionth) decimal

place. Wanting to replicate a previous entry, Lorenz set his computer to work but only to enter up to the 3rd decimal place to save time and printing space. The results were completely different.

In his speech to the American Association for the Advancement of Science, he said, "It is impossible to predict the weather; only what the weather might be" (Lorenz). The numbers being run through the same equations with a slight change in initial conditions leads to exponential changes from the anticipated outcome; also known as cause and effect. Likewise, the Butterfly Effect crystallizes the magnitude of chaos. The molecular change in initial conditions is illustrated by the butterfly flapping its wings; both are so incredibly small that they seem insignificant. But of course the resultant is a disaster 1,800 miles away? How is this pliable if traditional physics tells us that tornadoes are created by hot and cold currents? The underlying mechanism of this theory is that the Domino Effect as a higher ruling the longer the sequence of these events continue. In science fiction, H.

G. Wells wrote a novel on time travel, another perfect example of chaotic behavior, and said he wanted to "...go ahead of Father Time with a scythe of my own" (Wells). The idea that going back in time and doing something so small as killing a fly leads to everyone in the future growing genetically shorter is common and replayed in a thousand different verses. The years that pass by, the things that lead to this, to cause this to happen, etc. is the Domino Effect.

Consequently, each effect after the initial cause becomes the forthcoming new cause in a chain of interactions that fluctuate heavily from what was '

supposed' to happen. Sol LeWitt puts it more sharply," Every generation renews itself in its own way; there's always a reaction against whatever is standard" (LeWitt). To restate an aforementioned topic, what do all these ridiculous figures, calculations, and statistics mean? This means advances in biomedical engineering with new ways to battle certain types of cancer; it means a magnifiable way to study planets better without the need for a space explorer; the halting to a major economic plummet before nations fall and the existence of a faith-endowed currency perishes. This is the magnitude of cause and effect, and also of uncertainty. The realization to keep in mind is that mathematics in our mind is perfect, while the demonstration of it never is.

To control the dynamics involved in said processes is impossible. Such isolation of variables is at a scale that even gifted mathematicians fail to comprehend; " Although we cannot claim to have proven that the atmosphere is unstable, the evidence that it is so overwhelming" said Lorenz himself. Wherein cause and effect focuses the prehension that one occurrence caused the following to occur, Chaos Theory presents every possible cause that made the effect to, or not to, happen. That car bomb did not go off in New York City's Times Square. Had it had, imagine the emotional, economic, industrial, global, racial, historic, technological consequences that did not happen due to a faulty detonator.

That is also cause and effect. The conclusion brought forward is that Chaos Theory may have been involved since the beginning of time, but only recent formal ideas relating to cause and effect sprouted just 60 years ago. The study has been exemplified in several lights with the absurdly complicated to <https://assignbuster.com/cause-and-effect-chaos-theory/>

the simplest of equations. Logical order is harder to explain in a subject that says 1/10, 000 of a penny will make you a millionaire. But in exponential change over time, these sensitive dependents on initial conditions clone the very definition of cause and effect.

No other manipulations of integral accuracy yield responses to those such as Chaos Theory. “ Nothing is random anymore”-Jim Carrigan. Think of a best friend; how many thousands of things had to be just right (and could have been different) in order for both parties to meet? The answer, you may find, is chaotic.