Madeline J.
Brevard, North Carolina

Bouquet
Wood, paper, Acrylic paint, Foam

The phenomenon known as The Butterfly Effect exhibits how greatly small acts can affect our future. Stories where small acts create rippling effects and evidently have a huge impact on our future fascinate me. The power that even the tiniest actions hold brings me hope that with intent, every small decision I make can potentially lead to a future that is gratifying.

With my piece I chose to emphasize scale as a representation of how the smallest things can invent great change in our futures. Taking what you would normally think of as a minute and delicate object, a flower, and making it large and untouchable creates a sense of power, while also remaining delicate. The untouchable aspect of the flowers limits you when experiencing the piece. Allowing only minimal senses to experience it with. This adds an unknown to the viewer, an unknown much like the future, which is unpredictable. The flowers, made out of thin and light paper, can be damaged even with a drop of water. This represents how the most miniscule things can alter our futures permanently. The flowers, a Daffodil, Dogwood, Magnolia, Zinnia, and Morning Glory are subtle, yet ever present within my life. The daffodils have grown at the foot of the mailbox at both houses I have grown up in, and my mom allows Morning Glories, my favorite flower, to consume our railings leading to my house. My aspiration is for you, as the viewer, to recognize the power and the beauty that small things can hold.

Can I Predict the Future?

Madeline J.

The Oxbow School

OS48

Writer's Note: This paper discusses the capability at which humans can predict the future. This is done through the scientific explanation of "chaos", but also through stories where notes of this behavior are discussed. Through this explanation poses the importance that small aspects have on affecting the future.

I'm obsessed with tiny things. I collect dollhouse furniture and seashells. I like the idea that I can drop my coffee on the floor of the local bakery in Brevard, North Carolina and it'll lead to an interruption all the way in California. Alan Turing was a mathematician and philosopher who lived in England during the 1950s.[1] When you Google his name the first question that comes up in the "people also ask" section is "who did Alan Turing have a crush on?" The answer is Christopher Morcom, apparently his first love. But Google tells me he married a woman. Turing said that "the displacement of a single electron by a billionth of a centimeter at one moment might make the difference between a man being killed by an avalanche a year later, or escaping." Attention is in the details.

When there are tourists in Brevard you can tell who they are based off of what they're wearing and how stupid they act. I saw someone get eaten by a bear once. I knew it was going to happen because he left his Jiffypop campfire popcorn out instead of throwing it away in the bear proof trash cans that are provided at every campsite. I witnessed a woman fall 190 feet to her death. She thought the waterfall was beautiful. She slipped. These things are easy to predict.

In the late 1600s Issac Newton created what we now call the laws of motion and universal gravitation.[2] These laws give us the ability to predict the future in a binary way. We are able to

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[1] Hodges, Andrew. 2000. Alan Turing. Martinsville, VA: Walker Books.
[2] Croy, Anita. 2021. Sir Isaac Newton. St. Catharines, Ontario, Crabtree Publishing Company

predict the motion of things like planets and asteroids through equations because of Isaac Newton's revelations. When he couldn't figure out the three body problem he didn't rest for three weeks. I imagine him sitting at his desk, sleep deprived, dry skin, thirsty, feigning for an answer. I don't think he knew the weight of what he was solving. Discovering.

Chaos has had a long history but really came into focus in the 1960s when Edward Lorenz, an American mathematician and meteorologist, stumbled upon the behavior. He did so when attempting to create a basic computer simulation of the world's atmosphere to predict weather patterns.

The simulation was composed of 12 equations and 12 variables that included things like temperature, pressure, and humidity. The computer would print a row of 12 numbers through specified time intervals that he could examine and analyze the data as they progressed over time. When attempting a redo of a run he quickly entered the numbers midway through a previous run. When doing so the printer accidentally entered the components as three decimal places less than the original numbers.

The idea that the death of one butterfly could eventually have a far-reaching ripple effect on subsequent historical events first came up in Ray Bradbury's 1952 short story "A Sound of Thunder." In the story, it is 2055 and time travel has become the new hot air balloon ride. The luxury attraction that only people who can casually drop ten grand get to enjoy. Except this attraction has an interactive feature. "Join a hunting party that will travel back 66 million years to the Late Cretaceous period, on a guided safari to kill a Tyrannosaurus rex." Our main character, Eckels, is intrigued. The regulations of the trip are explained by the travel guides once the party of Eckels, and the two other hunters, hit their destination, 66 million years in the past. The "necessity" that the hunters must stay on the levitating path is explained to them. If they do not stay on the

path they will inevitably create extra altercations to the environment they are visiting. The tiniest altercations, footprints, the break of a flower's steam, have the ability to create "catastrophic changes in history." However, the dinosaurs they are allowed to kill have been calculated to only minorly affect the future. Eckels decides that these minor inconveniences are well worth the satisfaction and thrill of killing a dinosaur.

 When it was his turn to shoot he became afraid of the dinosaur. Eckels fell off the levitated path. He overestimated his bravery. His fall onto the forest floor and left the tour guides furious. Eckels' slip up is responded to by the threat of being left behind. Eckels is not left behind.

When returning to 2055 Eckels notices change. Changes in how English is spelled and spoken, and how different human behavior has become. "Looking at the mud on his boots, Eckels finds a crushed butterfly, whose death has apparently caused a rift in the timeline that has affected the nature of the alternative present..." Eckels' pathetic pleas to go back in time and reverse his damage are met with his death. The guide's response to Eckels chicken-hearted clumsiness is… a sound of thunder.

I would argue Eckels' lack of bravery was predictable. What man would not be afraid of a dinosaur ten times larger than him? Most men are afraid of a spider 100 times smaller than them. Hypothetically what if he was never afraid, what if he was in awe which caused him to miss step? What is the likelihood that he could have fallen just because his shoes were a couple sizes too big? How narrow do you think the levitated path was? Why didn't they put up guard rails?

However I don't think I could have ever been able to predict that the death of a butterfly, "66 million years ago" could lead to a complete altercation of the English language. Am I typing with the spelling of the altered version? Is my behavior while typing, frantically, on a bean bag, different then it would have been if the butterfly was never murdered?

Lorenz was not yet aware of the three decimals and he walked away from his simulations to get coffee. He thought it was the perfect time to step away because all he was doing was reprinting an already existing run. When he came back he realized his simulation was producing data that was not even recognizable to the data he was just analyzing minutes ago. Meaning it was predicting an entirely different atmosphere then the one he was trying to reprint. Where there were clear skies, now there was a blizzard.

While trying to figure out what could have happened to cause the drastic change he was contemplating the possibility that his computer had broken. He was frustrated that the computer was fine, and that it wasn't just an issue he could fix by turning it off and back on. He began looking for answers in the graphs. He realized that the new run had followed the old for a short amount of time but quickly morphed into the unrecognizable integers. From here he was able to pinpoint where the error lied, in the beginning of the run.

Lorenz now finds that the decimals are three places less than they should have been. The power that the decimals had, while being less than one part in a thousand, could control whether I left the house in a snowsuit rather than a bikini.

Lorenz's system was displaying what can be known as sensitive dependence on initial condition. In which a small change in one state of a deterministic nonlinear system can result in large differences in a later state.

Mom: Well, I can explain from my life, you know, sort of career trajectory, if you want me to do that.

Me: Do you feel really connected to that?

Mom: Yeah and it's easy to retrace the steps, if you don't like it you can just delete it or embellish it.

Me: I don't really want to embellish when it's something like your career trajectory because that's like the truth.

Mom: Well, it's also the reason I quit smoking.

Me: Oh

Mom: So my parents… when they were married…

Me: Yeah.

Mom: They owned a sewing store.

Me: I didn't know that.

Mom: It was called Stitching Post, and it was in Americus, Georgia, and they owned a sewing and notions store. They both knew how to sew. They both learned how to because my grandmother knew how to sew. They got divorced when I was one year old though. But as I grew up, they both sewed. So they taught me how to sew when I was young. And then when I went into college, I still sewed, just sort of as a side, you know, just as a hobby. I went to business school at Georgia State for college. And well, two nights a week I would take sewing classes at the local Hancock fabrics from this little old lady. She taught me how to sew, like more refined. I started learning how to make draperies and add ruffles to pillows and all kinds of stuff.

Maddie: How'd you find out about the lessons?

Mom: I broke the needle of the sewing machine while making too many versions of the same tank top. So I took it to the sewing store to get it fixed and then found out that the store offered lessons.

Maddie: Wait, what tank top?

Mom: A tank top that looked really good on me. I went to a party where this guy, who was an attorney, named Scott.

Maddie: Complimented you on the tank top.

Mom: Complimented me on my tank top, so I made more of them.

Maddie: Did you make that up?

Mom: No, he was a married guy and he told my friend, Angela, that I was the kind of woman that makes a man wish that they weren't married.

Maddie: (laughing) Oh my god

Mom: (laughing) What, I was only like 20/24 So I made a lot of tank tops that looked just like the one I was wearing when he complimented me. Anyway, one night when I was in college, I went to my neighbor Trey's house for a porch party.

Me: What do you mean porch party?

Mom: Like to drink and smoke cigarettes on the porch. So I went to Trey's house and I met this other neighbor, Amy, at Trey's House.

Me: I have a teacher named Amy, I love her.

Mom: You've talked about her. So Amy was an interior designer, and she was talking about a project she was doing where she couldn't find anyone to sew a canopy bed. So I told her I can do it. This led to me sewing draperies and things like a canopy bed for Amy and other interior designers she knew and I got close with Amy while all of this was happening. Amy introduced me to Lee, who was her boss, but Amy ended up getting in a fight with Lee which got her fired. And then Lee offered me Amy's old position so I took it. After I worked with Lee for a couple years I got really good at interior design and also how to have a client and how to sell to a client. But then when we moved to North Carolina

Maddie: Ugh

Mom: I know, but I thought I wasn't ever going to do interior design again, I thought I was

just going to garden and substitute. Which I did for a second. But then my friend JJ introduced me to Parker who runs the Architecture Firm in Brevard.

Maddie: You met JJ in high school right?

Mom: Yeah he sat next to me in class, and he was friends with Parker because he also ended up working in Brevard. JJ was kind of the one who convinced me to move us here. Alright so basically Parker's architecture firm needed an interior designer so I proposed myself and took on the job of being the Firms Interior designer. Fast forward six years and I have built an interior design department for the company. I now have 8 employees and run a furniture store that I get to pick all the inventory for.

If Scott, the creepy sounding middle aged man, never hit on the younger version of my mom… If the seating arrangement of my moms high school class was arranged so she would sit next to "Jane" instead of JJ… If Amy got food poisoning the day of the porch party and never showed… My mom wouldn't be an interior designer. She wouldn't have ever opened her store. She probably wouldn't have ever even moved us to Brevard, North Carolina. If any of the altercations had occurred, for all I know she could have turned out to be a firefighter. The amount of ways this story could end becomes chaotic.

Chaos: sporadic and haphazard behavior of deterministic physical systems. A deterministic physical system refers to a system where there is no randomness and development of the future is crafted by the initial starting place. If you input the exact same initial points into a deterministic system you will always get the same result. The dynamical evolution has extreme sensitivity to small changes in the initial conditions. These changes act as entirely new initial positions.

Chaos is why the future is statistically impossible to predict. Every individual tiny change leads to a very unique result. Say my mom sitting next to JJ in class was the single, initial action

that's led to her being an interior designer. If my mom would have sat next to Jane, this one change could have led her to instead becoming a Firefighter. Sat next to Bobby, a grocery store clerk and next to Lucy, a Ballerina.

The unpredictable future that can be created by just a seating arrangement of a high school class, is due to chaos. Chaos moves stability to instability and order to disorder. We are incapable of predicting the chaos of every possible altercation that can affect a system and the subsequent futures they can create, meaning we are practically incapable of predicting the future.

When you see something coming it's because you've probably seen or heard of it happening before. Looking at historical events has actually been proven to be more accurate when speculating what's going to happen, rather than trying to with current information. Initial conditions being repeated in the same situations, creating the same outcomes. If going to bed really late makes you cranky then you can expect to be grumpy when you wake up after you go to bed really late. Get some sleep. Don't kill a butterfly. Take compliments from strangers. Small things matter. Both Lorenz and Issac knew the reality of the power they held now it is your turn to. The tiniest details will create your future. Recognize them, appreciate them as they are determining where you're headed.

Works Cited

Biswas, Hena, et al. "CHAOS THEORY and ITS APPLICATIONS in OUR REAL LIFE."

Barishal University Journal Part, vol. 1, no. 1&2, 2018, pp. 123–140,

bu.ac.bd/uploads/BUJ1V5I12/6.%20Hena%20Rani%20Biswas.pdf.

This piece defines what the chaos theory is

Explained that the chaos theory uses math to she that everything happens for a reason which

disproves the definition of a coincidence

I will use this piece as a reference in the body of my passage showing the statistics behind how

coincidences are not coincidental

https://bu.ac.bd/uploads/BUJ1V5I12/6.%20Hena%20Rani%20Biswas.pdf

"The Coincidence Project | Bernard Beitman Md." Bernard Beitman Md,

www.coincider.com/the-coincidence-project. Accessed 20 Apr. 2023.

The coincidence project's mission is to utilize the phenomenon that is coincidence to gain a

larger sense of self and to learn about how much of a role you play in coincidences you

experience. Through learning this you can utilize your role to work at your own fate.

I can use this site to help me write the closing of my essay which ties the importance of every

aspect of an individual's life in how they want to manipulate there future

https://www.coincider.com/the-coincidence-project

MD, Mark Hyman. "Coincidence or Synchronicity?" Dr. Mark Hyman, 11 Feb. 2020,

drhyman.com/blog/2020/02/11/coincidence-or-synchronicity/. Accessed 20 Apr. 2023.

Describes how people give power to coincidences because they can hold a personal importance

One person could think of something as a coincidence when another individual could have no importance or element of surprise surrounding the coincidence

no coincidences and that everything holds meaning

By exploring our own awareness at its deepest level, we see how everything is connected and will not be surprised when a "coincidence" occurs

This text helps me as it holds valuable information about how coincidences are not actually coincidental.It talks about how humans give power to coincidences that only they hold and create rather than the occurrence itself holding power. It is a good transfer piece into the body of my essay being how math and science proves them to not be true.

https://drhyman.com/blog/2020/02/11/coincidence-or-synchronicity/

"Strange Coincidences: Are They Fluke Events or Acts of God?" Los Angeles Times, 1 Dec. 2022, www.latimes.com/california/story/2022-12-01/how-coincidences-help-us-make-sense-of-the-world. Accessed 20 Apr. 2023.

"What I look for as a scientist and a spiritual seeker are the patterns that lead to meaningful coincidences," said Beitman, 80, from his home in Charlottesville, Va. "So many people are reporting this kind of experience. Understanding how it happens is part of the fun."

"Researchers who study coincidences are divided over their significance. Some, like Beitman, believe they suggest a deeper connection between our minds and the material world than modern science can explain. Others see coincidences as pure mathematical probabilities akin to the "infinite monkey theorem" that states that a monkey hitting keys on a typewriter randomly for an infinite amount of time will eventually produce the works of Shakespeare. Unlikely perhaps, but not inexplicable."

"Beitman defines a coincidence as "two events coming together with apparently no causal explanation.""

"They can be life-changing, like his experience with his father, or comforting, such as when a loved one's favorite song comes on the radio just when you are missing them most"

The element of surprise is essential, said Mark Johansen, a psychology professor at Cardiff University in Wales. "When you experience a coincidence, you are surprised because there was an event that conflicts with your causal model of how the world works," he said. "There's a mismatch."

People who describe themselves as spiritual or religious report noticing more meaningful coincidences than those who do not, and people are more likely to experience coincidences when they are in a heightened emotional state — perhaps under stress or grieving.

There are misinterpretations because humans strive for explanation and when they cannot find it they choose what belief they associate with the most. People say coincidences happen because of god, fate and higher power, the universe. All these different answers leads to mystery rather than truth

Synchronicity

Hand calls this the law of truly large numbers. "You take something that has a very small chance of happening and you give it lots and lots and lots of opportunities to happen," he said. "Then the overall probability becomes big."

less sensitive to coincidences, would have noticed the coincidence at all. Such a person might simply have assumed he had a dry throat.

Would Beitman have been just as amazed if he'd choked at the same time as a sibling lay dying — or a friend, a professor, or a neighbor? Each additional person on the list makes the

probability of one of those events happening more likely, Hand said.

But just because Hand has a mathematical perspective doesn't mean he finds coincidences boring. "It's like looking at a rainbow," he said. "Just because I understand the physics behind it doesn't make it any the less wonderful."

Jung defined synchronicity as "the coincidence in time of two or more causally unrelated events which have the same meaning."

Like Jung, Zeltzer believes meaningful coincidences can encourage people to acknowledge the irrational and mysterious. "We have a fantasy that there is always an answer, and that we should know everything,

This article expresses feelings about the want for coincidences to be magical and random, but when looked at on a deeper level can somewhat be made sense of.

By looking at a couple cases of coincidences the writer is contemplating his own outlook and opinion on coincidences by looking into how others choose to go out about the phenomenon whether it be god or the universe etc.

I think this is a beneficial piece to look at how people view coincidences in a supernatural power.

https://www.latimes.com/california/story/2022-12-01/how-coincidences-help-us-make-sense-of-the-world