

Unveiling the Wings of Change: The Butterfly Effect in Postmodern Poetry

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الكشف عن أجنحة التغيير: تأثير الفراشة في الشعر الحديث

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Abstract

This research examines the transformative potential of the “Butterfly Effect” as a metaphor for empowerment in postmodern and contemporary poetry. By integrating the ingredients of chaos theory—specifically the conception that small actions can lead to substantial outcomes—this research manipulates a thorough analysis of a curated selection of poems from these poetic epochs. The objective is to delve into how “Butterfly Effect” works as a poetic symbol for resilience, growth, and positive modification, both on individual and societal levels. Through meticulous analytical methods and detailed textual explorations, the research investigates the strategies manipulated by postmodern and contemporary poets to tackle the metaphor of the “Butterfly Effect”. It aims at uncovering how these poets use the metaphor to advocate themes of empowerment, hope, and individual liberation. This research seeks to highlight how this metaphor not only enriches poetic expressions, but it also inspires individuals to realize their own potential for effecting considerable changes in a convoluted and generally unpredictable world. **Key Words:** Butterfly, effect, chaos, tiny, empowerment, Ripple.

الخلاصة:

يتناول هذا البحث الإمكانيات التحويلية لـ "تأثير الفراشة" كاستعارة للتمكين في شعر ما بعد الحداثة والمعاصر. من خلال دمج مكونات نظرية الفوضى - وتحديدًا المفهوم القائل بأن الأفعال الصغيرة يمكن أن تؤدي إلى نتائج جوهرية - يعالج هذا البحث تحليلًا شاملاً لمجموعة مختارة من القصائد من هذه العصور. الهدف هو التعمق في كيفية عمل "تأثير الفراشة" كرمز شعري للمرونة والنمو والتعديل الإيجابي، على المستوى الفردي والمجتمعي. ومن خلال أساليب تحليلية دقيقة واستكشاف نصي مفصل، يبحث البحث في الاستراتيجيات التي تلاعب بها شعراء ما بعد الحداثة لمعالجة استعارة "تأثير الفراشة". ويهدف إلى الكشف عن كيفية استخدام هؤلاء الشعراء الاستعارة للدفاع عن موضوعات التمكين والأمل والتحرر الفردي. يسعى هذا البحث إلى تسليط الضوء على كيف أن الاستعارة لا تثري التعبير الشعري فحسب، بل تلهم الأفراد أيضًا لتحقيق إمكاناتهم الخاصة لإحداث تغيير كبير في عالم معقد وغير متوقع بشكل عام. **الكلمات المفتاحية:** الفراشة، التأثير، الفوضى، الصغيرة، التمكين، التموج.

Introduction:

The last few decades of 20th century witnessed the emergence of the most widely known principle of ‘Chaos Theory’: the principle of “the effect of butterfly wings causing a hurricane.” (Đuroška, 2023, p. 105). This principle maintains that “even a tiny amount of energy and activity is enough to produce a certain effect” ((Đuroška, p. 105). Actually, he was Edward Lorenz (1917-2008), a Meteorologist at the Massachusetts Institute of Technology who first coined the term “Butterfly Effect” in his 1972 famous paper which was entitled "Predictability: Does the Flap of a Butterfly's Wings in Brazil Set Off a Tornado in Texas?" (Burcher, 2012, 145). To illustrate, Lorenz was interested in weather prediction. He constructed a mathematical model of the weather, defined by a set of twelve differential equations that represented changes in temperature, pressure, wind

velocity, and the like. On a particular winter day in 1961, Lorenz wanted to re-examine a sequence of data emerging from this weather model. To save time, Lorenz began in the middle of the sequence, instead of the beginning. He recorded the number off his printout and left to let it run. When he came again an hour later, the sequence had advanced differently. Instead of the same pattern as before, it averted from the pattern, finished up extremely different from the starting. By all conventional notions of the era, it should have worked. He should have gotten a sequence very close to the starting sequence. What Lorenz later recognized, in Peter Baofu (2007) states, is that “a tiny change in the initial conditions of a system could drastically change its outcomes, which was contrary to the conventional view at the time that tiny changes could not make much of a difference to the outcomes” (p.119). When rendered into his work on weather prediction, Lorenz proposed something absolutely unconventional, in relation to what was later termed as the effect of the butterfly, in that “the amount of difference in the starting points of the two curves is so small that it is comparable to a butterfly flapping its wings” (G. Rae as Cited in Baofu, 2007, p.119). Or, as Ian Steward illustrates it, “the flapping of a single butterfly's wing today produces a tiny change in the state of the atmosphere. Over a period of time. what the atmosphere actually does diverges from what it would have done. So, in a month's time, a tornado that would have devastated the Indonesian coast doesn't happen. Or maybe one that wasn't going to happen, does” (Steward as cited in Baofu, 2007, p.119). In their book, *Philosophy of leisure: Foundations of the good life*, Bouwer & Van Leeuwen, eds. (2017) denote how the effect that Lorenz popularized grows into “an appealing concept to those thinkers looking for a way to explain a postmodern agency in the face of all forms of structural determinism” (p.42). They demonstrate how butterfly effect resists the old notion of living in a cosmos that works under a fixed scheme, either constrained by “the iron-clad perfection of God's plan” (p.42) or conducted by the essential regulations of nature. This deterministic outlook postulates that “any current state of an object is fully determined by earlier states,” (p.42) presupposing that every little thing unfolds out of urgency. Such determinism reverberates with those fascinated by the ‘Enlightenment’ prospect on science, where the world is often viewed as a huge machine functioning according to inflexible rules. In this schema, human agency comes to be restricted, limited by predetermined paths. By inquiring these presumptions, the butterfly effect paved the way for examining the nuances of free will and the potential for human impact amidst the intricacies of existence. It makes “individuals feel that they have at least some freedom, some personal control over the things that they want, the decisions that they make and the things that they do” (p.42). In other words, in contrast to “determinist (or compatibilist) views of human behavior”, (Kanes, ed., 2011, p.7) Lorenz's butterfly effect adapts “anti-determinist and in compatibilist views of free will” (Kanes, ed., 2011, p.7). It deactivates the ancient determinist impression which suggests that, as Terry Pratchett and Neil Gaiman wrote in *Good Omens* write, “the events that changed the world were things like big bombs, maniac politicians, huge earthquakes, or vast population movements” (Pratchett & Gaiman as cited in Barrett, Delsanto & Tartaglia, 2016, p.179). In opposition, Lorenz discovery activates a postmodern thought of agency which asserts that “the things that change world, are the tiny things. A butterfly flaps its wings in the Amazonian jungle, and subsequently a storm ravages half of Europe” (Pratchett & Gaiman as cited in Barrett, Delsanto & Tartaglia, 2016, p.179). Thus, ‘Butterfly effect’ encourages modern individuals to free themselves from “a linear and binary vision of the world, and replace it with a vision founded on accepting chaos and fractality” (Đuroška, 2023, p. 107). In a more accurate sense, by enabling a specific trivial cause to be the trigger of a significant effect, the effect of butterfly urges modern individual to think that he himself could be that small cause and that his action could be important on a global scope—it reinforces a hopeful view that an individual can change the world. In his (1993) book, *The essence of chaos*, Lorenz himself asserts this hopeful element to the butterfly metaphor, he says: “perhaps the butterfly, with the seeming frailty and lack of power, is a natural choice for a symbol of the small that can produce the great” (p.308). As such, the ‘Butterfly Effect’ emerges as a forceful metaphor for empowerment that transcends its scientific origins to occupy countless spheres of modern life, maintaining the literary and poetic spheres. In this vein, the volume *Dynamics of Long-life Assets: From Technology Adaptation to Upgrading the Business Model* (2017) by Stefan N. Grösser, Arcadio Reyes-Lecuona, and Göran Granholm asserts that “literature has disseminated the concepts of complexity theory—most notably, the 'butterfly effect,' which posits that a minuscule event in a distant locale can initiate a cascade of occurrences leading to significant disruption within an entire system” (p. 70). As a matter of fact, a recognition of such kind encourages postmodern literary wrights, especially poets, to use ‘Butterfly Effect’ as a literary metaphor to empower their readers to face the complexity and uncertainty of their world. For them, ‘Butterfly Effect’ serves as a reminder that even the slightest choices or seemingly insignificant actions can yield magnified effects over time, an awareness which

inspires postmodern readers to engage with the profound intricacies of universe despite its complexity and unpredictability. As such, individuals are encouraged to take property of their choices and realize the hidden consequences of these choices on themselves, others, and their universe at large. The upcoming part of this research will explore how postmodern poets manipulate the theoretical framework of the 'Butterfly Effect' to infuse their poetry with themes of resilience, optimism, and empowerment. It will highlight three key principles derived from the 'Butterfly Effect': the magnification of the ripple effect of tiny actions, the sensitivity to initial conditions, and the unpredictability of outcomes. Additionally, it will investigate how postmodern poets articulate these principles in their poems to advocate for themes of agency, empowerment, and resilience. Magnifying the ripple effect of small actions is the first theoretical 'Butterfly Effect' principle this research dwells upon. In brief, this principle exaggerates the impact of tiny actions. Postmodern poets leverage this metaphor to deliver their empowering message, a message which asserts Man's hidden agency for positive change. The metaphor of a butterfly's delicate wings causing a tornado symbolizes hope and optimism. Poems in this sector focus on exaggerating the power of seemingly minor actions, stirring readers to have faith in their ability to evoke positive alterations in their life. Poems such as "The Butterfly Effect" by Sian Wilmot, "Butterfly" by Joan Sweetman's and Jonathan Coulton's "Mandelbrot Set" can be viewed as representative examples in this poetic direction. Joan Sweetman is a prominent 20th century female poet who infuses her poems with reflections from her experiences as "a teaching Sister of the Society of the Sacred Heart in Ireland" (Deane, Carpenter, Bourke & Williams, eds., 1991. p.626). Her poem "Butterfly" from POEMS (1986) draws inspiration from the article "Butterfly Effect" published in the Tablet in February 1991 (Deane, et al. eds., 1991, p.626). Typical to her poetic approach, Sweetman writes this poem in a style which shows alignment with the metaphysical conventions of John Donne and George Herbert. She uses metaphors that bridge the gap between daily life and spiritual discerns. I.e., by dealing with the concept of the butterfly effect through the lens of electrical faults, Sweetman delves into the integrity of faith and science. "Butterfly", thus, "underscores the significance of the individual act" (Deane, et al. eds., 1991, p.626). Sweetman opens her poem with a blunt reference to butterfly effect, arguing how a butterfly's actions in one place leading to magnified consequences in another: The butterfly that stirred the air In Peking yesterday Can cause enormous turbulence Tomorrow in Bombay (Sweetman as cited in Deane, et al. eds., 1991, p.626) The coming lines of the poem allude to "morphic resonance" and "chaos scientist", such as: Anderi linde and Stephan Hawking. Those scientists asserted that "the universe could have arisen from a number of different configuration" (Bourke, et al. eds., p.626). Thus, these allusions deepen the metaphor of the butterfly effect, showing how "tiny unpredictable" can result in unexpected outcomes, much like how a butterfly flapping its delicate wings can ultimately effect weather patterns across the universe: So speak the 'Chaos' scientists Of morphic resonance, And tiny unpredictable Around the cosmic dance (Sweetman as cited in Deane, et al. eds., 1991, p.626) The rest of Sweetman continue using metaphor and imagery that reinforces the principle of exaggerating the effect of apparently trivial actions Look closer at their antic steps. Cry 'Chaos' not too soon. Perhaps their leaps are keeping time To an out-of-earshot tune (Sweetman as cited in Deane, et al. eds., 1991, p.626) The "antic steps" that Sweetman mentions in the previous lines stand for slight actions that may appear disorganized at first sight. Yet, the caution against crying "Chaos not too soon" indicates that what seems chaotic may actually have a higher order or objective. The phrase "out-of-earshot tune" presupposes that this motivating force is not immediately understandable, setting the assumption that there are hidden patterns in life that may not be apparent. The "leaps" of the butterflies utilizes the fact that small actions, even if we cannot see or hear them, can lead to influential outcomes: Then, Sweetman's refers to "quarky atoms", a scientific element, standing for the essential building blocks of matter. This imagery proposes that even at the microscopic layer, there is a sense of freedom and potential. The phrase "on some supernal breath" advocates a sense of the transcendent, maintaining that these tiny particles are part of a larger, cosmic design. This reinforces the notion that even the tiniest components of life have significance and can contribute to transformative change: And quarky atoms floating free On some supernal breath Can boost a global turning-point Where life wins over death. (Sweetman as cited in Deane, et al. eds., 1991, p.626) The phrase "boost a global turning-point" suggests that tiny actions can result in significant shifts in the broader context of life. The paradox between "life" and "death" emphasizes the stakes involved, suggesting that these small actions can have serious implications for existence itself. This highlights the idea that individual decisions and actions, no matter how small, can contribute to a larger narrative of renewal and hope In the coming lines, Sweetman becomes more direct in evoking her message of empowerment. She magnifies the influence of slight causes, urging her readers to realize their potential abilities for change:

So never say you're powerless Before these giant ills For all is process... Drop by drop The elixir distills. (Sweetman as cited in Deane, et al. eds., 1991, p.626) The phrase "giant ills" presents the societal or personal challenges that may seem insurmountable. Yet, Sweetman asserts that even in the face of overwhelming struggles, individuals possess the capacity to effect change. The metaphors of "Drop by drop / The elixir distills" clarify the progressive essence of change. Sweetman maintains that transformation is a process, and each tiny effort contributes to a larger results. Then, Sweetman makes a reference to the "Peking butterfly". The reference serves as a poignant symbol of the butterfly effect concept. Sweetman declares: And your small effort, seen as slight As Peking butterfly Can be the straw that breaks the back Of all that's gone a-wry. (Sweetman as cited in Deane, et al. eds., 1991, p.626) Just as the flapping of a butterfly's delicate wings can initiate a chain of events leading to a hurricane, Sweetman asserts that apparently slight actions can lead to sweeping consequences. The lines "can be the straw that breaks the back / Of all that's gone a-wry" further highlights this notion, involving that even the smallest attempt can restore the balance and establish meaningful change. The ending stanza of the poem, once again, encapsulates the central theme of the poem as it magnifies the power of tiny actions, and admits that they are not only valuable, but also essential in the grand scheme of things: And surely small is beautiful, And multiplied has might To draw the rainbow web of things Into the Point of Light. (Sweetman as cited in Deane, et al. eds., 1991, p.626) One more example of magnifying the influence of tiny actions is Sian Wilmot's poem "butterfly effect". The poem is quoted by many books that focus on the effect of small movements in Man's emotional and physical promotion like Stephan Marchant's book, *Dansen door het leven: Groei en verbindend* (2024). The poem exaggerates the consequences of small actions in one's life. Wilmot begins with encouraging appeal to her readers, stirring them to acknowledge their presence: You need to stay And you need to stay loudly "You're afraid of making bad choices but the truth is this: the tiniest actions will influence the course of the rest of your life and you cannot control it. (Wilmot as cited in Marchant, 2024, p.51) Such encouraging outset of the poem highlights the ripple effect of individual's small decisions, assuming that they evolve over time to establish our realities. The poem promotes individual to confess his present state as a solo intersection of limitless minor decisions, all of which carry weight and importance. Wilmot's poem evokes the core principle of chaos theory, particularly the butterfly effect, demonstrating how seemingly trivial actions can lead to deep consequences in one's life. The poem's central theme invites individuals to recognize the power embedded in everyday decisions. Then, Wilmot delves into providing numerous instances of mundane actions and occurrences— such as: "a delayed train" or "an extra cup of tea" — that intricately weave into the fabric of one's life, shaping his living in styles that he might not instantly admit. Wilmot writes: So many factors play a part in you being here today a delayed train, an extra cup of tea, the number of seconds your parents took to cross the street. This is "chaos theory. Sensitivity. Mathematics." (Wilmot as cited in Marchant, 2024, p.51) After highlighting the significance of minor actions through the lens of chaos theory, Wilmot invites her readers to embrace the potential for change that lies in the tiny act of choosing. Wilmot declares: You are here. And every choice you have ever made has led you to right now, reading this. While you exist, every movement and moment matters those bad choices led you to the best days of your life, if you were to play it all in rewind. So let them go. Change will come, even if you're standing still. Butterflies will keep flapping their wings and causing hurricanes. So, make your choices and make them loud. Trust your gut. Trust energy (Wilmot as cited in Marchant, 2024, p.51) The rest of the poem, once again, magnify individual's role in his universe, suggesting that the absence of an individual would cause observable disruptions in the cosmos: Oh, the universe would notice The mess that would make The hearts that would break. And if you ceased to exist? Oh, the universe would notice. The mess that would make. The hearts that would break (Wilmot as cited in Marchant, 2024, p.51) Wilmot's terminates her poem with a call to her readers to "stay". Her call asserts a commitment to being present and engaging with life, empowering the notion that, despite the apparent insignificance of their choices, yet, every decision counts and every tiny action carries the possibility of drastic change. Thus, the ending lines of the poem can be viewed as a call for a life lived fully, with intention and awareness, causing "a few hurricanes" along the way: (Marchant, Stephan. (2024). *Dansen door het leven: Groei en verbindend door creatieve bewegings processen*. Lannoo Meulenhoff - Belgium.) So just stay. Stay for bad choices. Stay for great ones. Stay. Cause a few hurricanes (Wilmot as cited in Marchant, 2024, p.51) Not so far from Sweetman and Wilmot's butterfly poems is Jonathan Culton's lyric "Mandelbrot Set". The lyric is a tribute to Benoit B. Mandelbrot, a Polish-born French-American mathematician. Benoit is best "known as the inventor of fractal geometry and the Mandelbrot set" (Frame & Mandelbrot, 2002, Preface, p.ix). The lyric highlights a stark distinction "between extraordinary and ordinary

lives” (Barnet, 2013, Preface p.i). It separates those who make influential alternations in the universe, whether through tiny actions or grand gestures, from those “who sing about them or merely ruminate”(Barnet, 2013 Preface p.i). In a manner as such, Culton’s lyric interweaves the themes of mathematics and the butterfly effect, where apparently a tiny action, like a butterfly flapping its wings, can result in drastic consequences. The opening lines of the lyric portray a world of "pathological monsters" that stands for hypothetical mathematical conceptions that create a kind of anxiety and discomfort inside mathematicians: Pathological monsters! cried the terrified mathematician Every one of them is a splinter in my eye I hate the Peano Space and the Koch Curve I fear the Cantor Ternary Set And the Sierpinski Gasket makes me want to cry. (Culton as cited in Glaz & Growney, eds, 2008. P.141 The phrases: "Peano Space," "Koch Curve," and "Cantor Ternary Set" demonstrate the abstraction and complexity associated with advanced mathematics. These phrases at the opening lines of the lyric highlight how trivial notions or concepts in mathematics can evolve into vast and complicated structures. The mathematicians’ fear of these "demons" asserts how overwhelming the implications of small can be when magnified through inquiry and exploration. Just like the flapping butterfly, slight ideas can lead to a storm of complexity. Then, Mandelbrot is presented, depicted as someone who defies and challenges these fears. His understanding of fractals and infinite complexity give him a chance him to "face those demons down," highlighting his ability to extract significant vision from simple rules. This depiction serves as a transition from fear to inspiration, assuming that individual actions, just like Mandelbrot's approach to mathematics, can result in revolutionary notions. Mandelbrot's character explains the butterfly effect in action: a single individual's contributions can fundamentally alter perceptions within a field. The mention of "infinite complexity" proposes that tiny, methodical steps can result in significant discoveries, mirroring the effect where a minor change can propel larger results: And a million miles away a butterfly flapped its wings On a cold November day a man named Benoît Mandelbrot was born. His disdain for pure mathematics and his unique geometrical insights Left him well equipped to face those demons down He saw that infinite complexity could be described by simple rules He used his giant brain to turn the game around And he looked below the storm and saw a vision in his head A bulbous pointy form (Culton as cited in Glaz & Growney, eds, 2008. P.141) After that Culton turns into explaining the mathematical process for deciding if a point is within the Mandelbrot Set. The meticulous steps of squaring and adding constant “C” signify how repetitive tiny actions are fundamental to discovering enormous, complex patterns. Each iteration depend on the last, creating a structure that comes up from primitiveness. Such mathematical procedure incarnates the butterfly conception, the repetitious behaviour, assimilated to the flapping of butterfly’s wings, lead to the formation of complex structures, entitled as “fractal”. It focuses on how apparently trivial mathematical operations, when repeated, can yield stunningly intricate results: He picked his pencil up and he wrote his secret down Take a point called Z in the complex plane Let Z_1 be $Z^2 + C$ And Z_2 is $Z_1^2 + C$ And Z_3 is $Z_2^2 + C$ and so on If the series of Z’s should always stay Close to Z and never trend away That point is in the Mandelbrot Set (Culton as cited in Glaz & Growney, eds, 2008. P.141 In the closing lines, the lyrics affirms that the Mandelbrot Set can "change the world in a tiny way." This evokes an essential principle of the butterfly effect, proposing that while individual actions might seem trivial, they can have profound results. The optimistic outlook in “sweeping all our fears away” suggests that comprehending simplicity within complexity can empower individuals to force change. Thus, the terminating lines resonate with the notion of agency. They reiterate that by embracing tiny actions, understanding and exploring mathematical principles, individuals can enact broader changes. This asserts the fundamental butterfly concept: small thoughts can result in significant alterations in one’s life Mandelbrot Set you’re a Rorschach Test on fire You’re a day-glo pterodactyl You’re a heart-shaped box of springs and wire You’re one badass fucking fractal And you’re just in time to save the day Sweeping all our fears away You can change the world in a tiny way (Culton as cited in Glaz & Growney, eds, 2008. P.141) “Unpredictability” is one more butterfly effect’s ingredient upon which postmodern poets draws to inspire their readers to admit their agency and capacity to force positive change. In her book, *Secrets of Success: The Science and Spirit of Real Prosperity* (2010), Sandra Taylor accounts for the manipulation of this unpredictability on the layer of individual’s life. She explains how this principle offers “a fascinating look into the process of change, examining how our layered lives evolve into what we experience” (p.28). The principle indicates that although “a system's evolving outcomes should be predictable and relatively simple, they can take an unexpected turn, becoming extremely unpredictable-leading in entirely new and unique directions”(p.28). This provides an opportunity of what Taylor called “adjacent possibilities”, a prominent component of the chaos theory and its butterfly concept. It asserts that no matter what predictable result may be expected, there is constantly the possibility that

something different may happen, enlightening the excuse for diversity and creating new conclusions. This indicates that individual's capacity is never restricted by old patterns or definitions. One's life is evolving all the time. Taylor conceives that at any moment "there are dozens- even hundreds-of adjacent possibilities, countless options of perception, thought, and reaction that will completely alter your reality" (p.28). A planned change in focus, or the decision to establish optimistic interpretations, could lead to wonderful, unexpected future changes. This notion is eloquently coined by postmodern poets as an empowering and liberating principle that envisions a future for humanity filled with boundless potential and endless evolution. No matter what pattern may have been designed for individual in the past, there is eternally the chance to slip into "some other new adjacent possibility, one that will lead to the ultimate arrival at yet another divergent outcome-unpredictable and excitingly removed from anything you might have expected!" (p.28). In light of this understanding, postmodern poets employed this principle to assert their readers that "anything is achievable, a magnificent future is within your grasp when you consistently choose to move into more purposeful and empowering adjacent possibilities of thought" (p.28). "Love's Discrete Nonlinearity" by Ronald Wallace from his long poem "Chaos Theory" is a unique poem of unpredictability. The poem first appeared in the anthology, *Strange Attractors: Poems of Love and Mathematics*. Structurally, the poem falls into three parts, namely: "Sensitive Dependence on Initial Conditions", a part that this research deals with in a coming part, "Love's Discrete Nonlinearity" and "Strange Attractors" (Glaz & Growney eds., 2008, p.66). The poem deals with the intricate and unpredictable nature of life and love. The poem draws parallels to the dynamics of ecosystems and the chaos theory. It explores the notion that no heart's desire is completely predictable or repeatable, much like the fluctuating populations of foxes and rabbits in an ecosystem. Wallace writes:

No heart's desire is repeatable, or,
therefore, predictable. If a few hungry foxes
gorge on a large population of rabbits,
the population of foxes increases
while that of the rabbits declines,
until some point of equilibrium is passed
and the foxes begin to vanish with
the depleted supply of rabbits, and then
the rabbits multiply, like rabbits. And so on. (Wallace, 1995, p.169)

Then Wallace assimilated the ebb and flow of desire and fulfillment to the natural cycles of life, where love can lead to disappearance and potential return. Wallace employs the metaphor of foxes and rabbits to explain the cyclical nature of relationships and the unpredictability of love. The poem proposes that even in the face of disappearance loss and, there is constantly the possibility of return and renewal:

The ebb and flow of desire and fulfillment
is a story as old as the world. So,
if I loved you, finally, too much, until
you began to disappear, and I followed,
would you theoretically return to love
repeatedly again? There are forces so small

in our story of foxes and rabbits no Malthus could ever account for them (Wallace, 1995, p.170)

The lines also refer to Thomas Robert Malthus, an English economist and demographer who is best known for his theory that population growth will always tend to outrun the food supply and that betterment of humankind is impossible without strict limits on reproduction (Malthus & Winch, 1992, p.15). Wallace reference asserts the restrictions of conventional theories in illustrating the complexities of human emotions and relationships. Wallace further suggests that life is inherently unpredictable and that embracing this unpredictability can lead to empowerment and hope for the future. The imagery of continent coastlines and their infinite longings inscribed by finite space and time symbolizes the unpredictability of life and love, finding strength in the chaos and uncertainty to shape their own futures and find hope in the midst of complexity:

Whole species daily disappear, intractable
as weather. Or think of a continent's
coastlines, their unmeasurable eddies
and whorls: infinite longings inscribed

by finite space and time,
the heart's intricate branchings. (Wallace ,1995, p.170)

Clint Smith's "Chaos Theory" from Counting Descent is one more poem that make use of the butterfly effect's principle of unpredictability for an empowerment purpose. The poem takes its reader into a world that is haunted with unpredictability or non-linearity. Smith opens his poem with a contemplative inquiry:

"If twenty million years ago
the butterfly flew in a different
direction do you think
we would have met, maybe
we wouldn't have even been
people, maybe we wouldn't
have even been us, you know,
maybe you would have
been a tortoise and I would

be a raspberry"... (Smith,2020, p. 73).

Through this imaginative lens, Smith claims that our identities, relationships, and destinies are intricately woven into a tapestry of chance. The repetition of "maybe" focuses on the myriad possibilities that hinge on tiny, seemingly inconsequential decisions. The speaker muses on alternate realities where they might be a tree or even a plant, showcasing how interconnected existence transcends mere encounters. As the poem progresses, Smith elaborates on the interconnected web of life:

"maybe I would be an oak cut
down to be the home that held
you, maybe I would have never
been, maybe the butterfly's wings
would have blown the seed

into the river"... (Smith, 2020, p. 73).

Here, the imagery of nature and the interplay of life and chance underscore the delicate balance of existence. Smith poignantly illustrates how a single butterfly's flight could alter the course of life, rendering the meeting of two souls a potential tragedy if circumstances had shifted.

The concluding lines encapsulate the weight of possibility and the beauty of serendipity:

"I could go on
but what I mean to say
is that it would have been
such a tragedy
if something happened
that would have prevented me
from meeting you
like a butterfly
who didn't realize it was flying

in the wrong direction". (Smith,2020, p.73).

Ultimately, Smith's "Chaos Theory" advocates the spontaneous nature of human connections, inspiring readers to appreciate the frail yet dynamic forces that figure their lives. By utilizing the transformative forces of seemingly trivial moments, Smith's poem empowers individuals to recognize the significance of their choices, the profound impact they can have on the cosmos. Along with the magnifying the ripple effect of tiny events and unpredictability is the principle of "Sensitivity to initial conditions". In other words, Sensitivity to initial conditions is one more butterfly effect's ingredient upon which modern poets work to advocate human agency for positive change. The principle stands for "the high level of importance of primary conditions from which the future path and direction of a system stems" (Ofulla,2013,p.4). It can also be termed as "bifurcation" or "interconnectivity" of dynamic systems to initial conditions. To elaborate, sensitivity to initial state highlights the details of complex systems where the flapping wing, representing a trivial modification in the introductory condition of the system, causes a chain of events leading to extensive development. In his book Relationship within (2013), I.F.Smyer explains how the concept of sensitivity or interconnectivity "deals with relational systems in dynamic equilibrium, such as family systems, ecosystems, economies, societies, etc" (p.42). He goes

further to assert that “interconnectedness is a perspective that acknowledges interdependency among people and a view that refers to the moral, rather than physical or scientific ways that humans design relationships” (p.42). A realization of such kind, urges poets of post-modern era to underscore the importance of recognizing the ripple effects of individual’s initial actions and their potential capacity for positive change. They vividly show their readers how even the tiniest actions and decisions at the outset can set off a chain of startling mutually dependent reactions. An awareness of such kind empowers modern individuals to courageously grasp the responsibility they hold in the choices they make: urging them to consider the fact that similar to how a butterfly is interconnected within the natural world, humans are also integral component of the broader systems in the universe, where various parts interact and affect one another. Drawing on this conception, postmodern individuals are empowered to consider the implications of their choices and behaviors. They are stirred to admit that their actions and decisions “carry weight in the vast interwoven tapestry of existence” (Ponce, 2024, p. 147). Ronald Wallace’s “Sensitive Dependence on Initial Conditions” from his extensive poem “Chaos Theory”, that has been previously dealt with one of its parts in an earlier section of this research. The poem skillfully captures the essence of interconnectedness, a crucial component of the butterfly effect, to urge individuals to realize the power of their choices and actions. The poem starts with the familiar aphorism, “For want of a nail the shoe was lost,” illustrating how small, seemingly insignificant events can lead to massive outcomes—a lost shoe results in losing a horse, which leads to the loss of a battle and even a world. This chain of reactions serves as a prominent remembrance that every action, no matter how tiny, is interconnected. Wallace writes:

For want of a nail the shoe was lost,
for want of a shoe the horse was lost,
and so on to the ultimate loss—a battle,
a world. . . . (Wallace, 1995, p.169)

Wallace then turns into the metaphor of the butterfly’s wings, proposing that its delicate flap could cause ripples leading to massive consequences, like “a tsunami in Indonesia” or an influential moment in a personal life—a “small chill across the neck of an old love about to collapse in Kansas.” This imagery asserts that every experiment, from global happenings to personal relationships, is interlaced:

. . . . In other words, the breeze
from this butterfly's golden wings
could fan a tsunami in Indonesia
or send a small chill across the neck
of an old love about to collapse in Kansas
in an alcoholic stupor—her last.
Everything is connected. Blame it on
the butterfly, if you will. Or the gesture
thirty years ago, . . . (Wallace, 1995, p.169)

Further into the poem, Wallace dwells upon the power of fleeting moments—“the glance across the ninth-grade auditorium floor”—which can change the course of lives. The girl who gains the speaker’s attention becomes an essential figure, evolving from a lover to an ex-lover, conclusively transforming into a motivation for memory and emotional disturbance.

. . . the glance across
\ to the girl who would one day be your
lover, then ex-lover, then the wind
that lifts the memory's tsunami, . . . (Wallace, 1995, p.169)

The terminating lines advocates a notion of urgency, explaining how the past frames the present and the future: the mare of the imagination, bolting, the shoe that claps the nail down on your always already unending dream. (Wallace, 1995, p.169) Thus, Wallace empowers readers to embrace the chaotic nature of the world, urging them to confess that their initiative decisions can result in great outcomes. A realization of such kind forces postmodern individuals to navigate their lives with determination and purpose, and eventually realizing that their decisions can instigate ripples of alterations in their cosmos. Billy Collins’ “The Butterfly Effect”, from his collection, *Sailing Alone Around the Room: New and Selected Poems*, serves as one more vivid instance of how postmodern poets utilize sensitivity to the initial conditions to evoke a profound sense of empowerment in their readers. The poet opens with the portrayal of a butterfly resting in the depths of South America, an image

which Collins manipulates to advocate the intricate interconnectedness of seemingly disconnected events. The butterfly's delicate flutter is introduced as the catalyst for a chain reaction result in influential consequences, such as heavy rain on a future wedding day and a subsequent path to calamity. Collins declares:

The one resting now on a plant stem
somewhere deep in the vine-hung
interior of South America
whose wings are about to flutter
thus causing it to rain heavily
on your wedding day
several years from now,
and spinning you down
a path to calamity and ruin

is—if it's any consolation— (Collins, 2011, p.151).

Then, Collins delves into describing the beauty of the butterfly, specifically a “swallowtail” with vibrant colors and distinctive markings, highlighting the intricate details that make each individual unique:

a gorgeous swallowtail,
a brilliant mix of bright orange
and vivid yellow with a soft
dusting of light brown along the edges.
What's more, the two black dots
on the wings are so prominent

as to make one wonder (Collins, 2020, p.151)

Collins concludes his poem with a reference to the theory of “Batesian mimicry”, a theory that was introduced by the two 19th century naturalists, namely: Henry Walter Bates and Alfred Russel Wallace. The theory illustrates how non-threatening species evolve to resemble more dangerous ones, enhancing their chances of survival. Explaining his Theory, Bates writes:

Every species in nature may be looked upon as maintaining its existence by virtue of some endowment enabling it to withstand the host of adverse circumstances by which it is surrounded. The means are of endless diversity. Some are provided with special organs of offence, others have passive means of holding their own in the battle of life...A great number have means of concealment from their enemies, of one sort or other. Many are enabled to escape extermination, or obtain subsistence, by disguises of various kinds; amongst these must be reckoned the adaptive resemblance of an otherwise defenceless species to one whose flourishing race shows that it enjoys peculiar advantages.” (Bates,2021,42)

Working on such evidence, Collins wants to create a nuanced connection between this theory and the butterfly effect's principle of sensitivity to initial conditions. His over most desire is to demonstrate how these notions resonate within both ecology system and human experience:

if this is not an example of mimicry,
an adaptation technique whereby one species
takes on the appearance
of another less-edible one,
first brought to light,
it might interest you to know
and possibly distract you from

your vexatious dread

with regards to the hopelessness of the future,

by two British naturalists, namely,

H.W. Bates in 1862 and A. R. Wallace in 1865. (Collins,2020, p.151).

Thus, Collins invites readers to reflect on how their own choices can adapt and respond to their environments, much like species that mimic others for survival. He urges his readers to realize that, while their deeds may seem trivial or disconnected, they can resonate throughout the fabric of life, affecting others in unforeseen ways. Collins manifests this via referring to the butterfly's flutter wings, which inspire a series of events culminating

in ripple outcomes such as rain on a wedding day. Here, he asserts that apparently insignificant deeds can figure future realities, compelling readers to be mindful of their actions. To sum up, Collins' poem serves as a vivid example of how understanding the complicated web of interconnectivity within both the natural world and human relationships can inspire a future optimistic outlook. By weaving the ingredients of mimicry and sensitive dependence, individuals are empowered to admit their ability to shape not only their destinies, but also the tapestry of life surrounding them. He crafts a message of empowerment and resilience, compelling his readers to take heart in their capacity to generate positive change, much like a butterfly whose delicate flutter can change the course of actions in profound manners. "The Human Butterfly Effect" from *The Frequency of Light* (2013) by Alla Renée Bozarth is another example of manipulating butterfly effect's principle of interconnectivity or sensitivity to initial condition to empower modern individual to recognize their capacity to instigate positive change in their life. In the opening lines of the poem, Bozarth sets a scene haunted with a sense of routine and melancholy, portraying "the melancholy masses" trudging through their Monday morning. This portrayal demonstrates the lives of individuals caught in monotonous cycles, asserting their disconnect from the potential for impact. Bozarth writes:

Everything depends on sensitivity to initial conditions.

A first principle of Chaos Theory.

Monday morning and
the melancholy masses
begin their trudge,
worming down
the highways and train tracks
or hitting the tasks
immediate to home,

family or farm.

(Bozarth, 2011, p.60)

By referencing "the highways and train tracks" and the mundane tasks liked to "home, family or farm," Bozarth asserts how easily individuals can become lost in the daily life, unconscious of the power they have to advocate change. Bozarth's choice of words—"trudge" and "worming"—reveals a sense of inactivity and conformity, supposing that these individuals may not recognize their agency for positive transformation.

In a stark contrast to this introductory portrayal, Bozarth presents the butterfly in Hong Kong, whose seemingly delicate wing movement leads to a rainstorm in the Amazon. Via this empowering metaphor Bozarth stirs her readers to realize that even within such routine life, a trivial choice or action, like opening a door to let happiness pour out, can set off a chain reaction of change:

Meanwhile, a butterfly
moves its wings
in Hong Kong
and a rainstorm begins

in the Amazon.

(Bozarth, 2011, p.60)

As the poem continues, Bozarth turns the emphasis to a "genuinely glad / human being" who opens a door, permitting "happiness" to pour forth. This moment signifies the potential of positive actions to create a ripple of joy and change in the world. The phrase "catastrophically wonderful event" captures the irony of how a single moment of genuine happiness can disrupt the status quo, leading to unforeseen and uplifting outcomes.

At the same time,
a genuinely glad
human being
opens a door
and out from its
opening happiness pours—

Bozarth ends her poem with an appeal to her readers to:

Imagine what will happen
to the world
from that single
catastrophically
wonderful

event!

By terminating with the imperative to “imagine,” Bozarth instigates her readers to indulge in an active engagement of the spirit and mind. She stirs her readers to envision the possibilities that stem from their own actions, compelling them to embrace the notion that alteration begins with them. This works as a call to action, reminding her readers that within the complexity of life, their initial choices are interconnected and that each individual has the potential to instigate positive change, and ultimately fostering a belief in their capacity to shape their world.

Conclusion: This research demonstrates how the ‘Butterfly Effect’, as a metaphor, deeply influences postmodern poetry by interweaving chaos theory with poetic expression. Postmodern poets employ this conception to defy deterministic outlooks and focus on the significance of individual agency. Through concerned textual investigation, it becomes noticeable that butterflies, with their delicate imagery, mirrors the notion that even the tiniest actions—be it a word of kindness, an act of love or a moment of comfort—can generate significant and pervasive outcomes. By drawing on themes of growth, resilience and collective change, postmodern poets empower individuals to realize their potential to cause positive ripples in an otherwise chaotic universe. As such, the butterfly effect exceeds its scientific roots, appearing as a potent poetic metaphor that epitomizes optimism and the probability of individual liberation. In a universe defined by unpredictability, poetry becomes a vehicle for individuals to comprehend their capacity to frame both their own lives and the wider world surrounding them. This investigation confirms that through willful and cautious actions and decisions, every individual can become an instrument for change, asserting the surviving fact that even the smallest flutter of a butterfly's delicate wings can outline the future.

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