



Research Article

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Chaos Theory and Nonlinearity in *The Time Traveler's Wife*: Reading in Light of Hayles's Theory

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Abstract

This paper aims to focus on the subject of N. Katherine Hayles's nonlinearity in Audrey Niffenegger's The Time Traveler's Wife as a postmodern work. Niffenegger published her debut novel, The Time Traveler's Wife in 2003. This novel is a romance and science fiction which narrates the love story of Henry DeTamble – a man with genetic disorder that forces him to time travel unwillingly – and his artist wife, Clare Anne Abshire – who has to deal with his absence and dangerous experiences. Since Henry is a time traveler and experiences life in a non-linear manner, the main question of this research is that to what extent the characteristic of nonlinearity shapes the personality and un-consciences of Henry and Clare in a society which has been defined with Newtonian/Cartesian or linear thinking. To answer this question, N. Katherine Hayles's Chaos theory can be applicable. Hayles considers nonlinearity as one of the most important and fundamental characteristics of chaotic systems. One of the findings of this research is the inapplicability of Newtonian thinking in post-modern literature.

Keywords: Audrey Niffenegger, Cartesian/Newtonian Thinking, N. Katherine Hayles, Nonlinearity, The Time Traveler's Wife

1. Introduction

Henry DeTamble and Clare Abshire are the central characters of *The Time Traveler's Wife*. Henry is a librarian at the Newberry Library in Chicago and his wife, Clare, is an artist who creates sculptures with paper. The author narrates the story from the middle of events; it is 1991, Henry is 28 years old and works in a library which suddenly confronts with the 21-year-old Clare. She informs him that she knew him since she was six, but for Henry it is the first time he sees Clare. Henry immediately realizes that this event is one of the outcomes of his random time travels and nonlinear life he experiences. The story moves on with two different point of views – Henry and Clare's – from different time and places. The story provides multiple flashbacks and flash forwards to characters' lives to explain their characteristics and personalities more explicitly. In general, the narrative of the story does not move in a straight line and jumps from one time and space to another. Then, the dominant role of nonlinearity in Henry and Clare's lives would be explained in the framework of Hayles's literary theory of Chaos.

2. Theoretical Framework

Chaos theory, as a branch of science in physics, can be described as plotting points within a system of correlations. The major discovery of chaos theory with regard to literature can be the complex fluctuations in narratives. Thus, the application of this theory to literature can make the fragmentary narratives in postmodern/science fiction plots visible. In other words, the analysis of a literary work such as science fiction is conducted as the basis of contextualized close reading for themes, tropes, and structures which are scattered in narratives. In this regard, literature is seen as a single system of discourse in which subjects are constantly in flux.

Hayles in *Introduction: Complex Dynamics in Literature and Science* (1991) suggests that order and disorder have been considered as opposites. Traditionally, order was defined as a phenomenon which could be classified, analyzed, and understood by rational discourse; and disorder was associated with chaos. But, in the last twenty years there have been a radical reevaluation of this view. Science and contemporary literature saw chaos as extremely complex information rather than a phenomenon with the absence of order. This understanding introduced new ways of writing and thinking to science as well as critical theory and literature, and it led to the emergent of a new field of study known as the science of chaos, which later led to the emergence of relativity and quantum mechanics. These theories and ideas had a huge impact upon the cultural thinking. Regarding this, Hayles believes "the science of chaos is part of the culture, and that scientists, like everyone else, are affected by the culture in which they are immersed" (1991, p. 4). She also proposes that:

The world was growing at once more chaotic and more totalized; increasing economic interdependencies between nations, which brought home to nearly everyone that small causes could lead to large-scale effects; and rapid expansion of information technologies. All of these factors, and more, contributed to the cultural matrix out of which the science of chaos grew. (1991, p. 7)

The science of chaos is new because it has affected how people have imaged themselves and their relation to the world. One of the significant turning points in the science happened when the mathematician Jules-Henri Poincaré and physicist Albert Einstein called into question the inapplicability of Newton's assumptions about the material world and laid foundation for the development of quantum physics and chaos theory. Thus, nonlinear views gain credibility.

Hayles in *Chaos Bound: Orderly Disorder in Contemporary Literature and Science* (1990) suggests that postmodern texts contain characteristics of chaotic systems in the phenomenal world; the most important characteristic is nonlinearity. Nonlinearity or the so-called *butterfly effect* was first introduced to the world by Edward Norton Lorenz in 1972. In an academic paper entitled "Does the flap of a Butterfly's wings in Brazil set off a tornado in Texas?" he introduced the concept of butterfly effect to meteorology and soon entered into other fields of study such as mathematics, biology, physics, chemistry and sociology.

Chaos theory's nonlinearity stands opposite to Cartesian thinking. At one hand, Cartesian or linear thinking works according to the equality of cause and effect. It sees the whole as equal to the sum of its parts. It always moves toward closure and seeks to provide a fixed and absolute answer for a particular problem. At another hand, in nonlinearity there is no equality between cause and effect – a small cause would lead to a huge effect. It provides infinite answers for a certain problem and the whole goes beyond the sum of its parts. Although the Cartesian thinking was the most productive form of analysis for centuries, Hayles believes that we understand the world around ourselves in a nonlinear fashion. In *Chaos and Order* (1991), she marks that the postmodern man is not living in a stable world, but a world full of mystery and uncertainty. She emphasizes on nonlinearity because it changes the traditional structure of narrative; the reader does not face a realistic fiction which would be narrated by a predictable and absolute narrator. Hayles proposes that nonlinearity in literature emphasizes on the accidental, random, and irrational characteristics of human beings.

3. Methodology and Approach

The method adopted to practice chaos theory on Niffenegger's *The Time Traveler's Wife* is a library-based research. The major sources are written by Hayles who is an American literary critic and applied Lorenz's pioneering theory of chaos into the contemporary fiction. The sources are: *Chaos Bound*, as well as *Chaos and Order*.

The approach adopted in this research is Hayles' perspective. It mainly develops around her postmodernist innovative literature and scientific aspects of physics, chemistry, and mathematics which introduced the literary theory of chaos and can be applied to the novel. The core element of chaos theory is the notion of "butterfly effect" or "Nonlinearity." Hayles in her application of Chaos theory into literature tries to show the entanglement of science with culture and everyday experiences of 21st-century man.

The objective of this research is to focus on the nonlinearity of Henry and Clare in *The Time Traveler's Wife*. According to Hayles, nonlinearity or butterfly effect connotes that a small cause can give rise to a large effect (1990, p. 11). Therefore, one cannot find answers to nonlinear functions through Newtonian equations. The nonlinear and complicated situation needs the new science of chaos to break the limits and borders between territories. Hayles proposes a world which chaos is the Law of Nature and order stands as the Dream of Man. This chaotic world does not present disorder and destruction but, creation and construction. While chaos emerges from the individual, the order is an external force which is created by mankind to take control over chaos. In *The Time Traveler's Wife*, Henry is a time traveler and time travels randomly without having any control over it. The researcher assumes that this character has to experience his life in a nonlinear manner and even those who are in touch with him – Clare, for instance – would have the same experience. More importantly, the researcher focuses on Clare and tries to show that although she is not a time traveler and lives in her hierarchical timeline, she deals with nonlinearity and she can have her own kinds of disorder.

4. Nonlinearity of Hayles in *The Time Traveler's Wife*

The Time Traveler's Wife centers on the love story of Henry DeTamble, a time traveler and his artist wife, Anne Clare Abshire. Although Henry is a time traveler and time travels to different time and places unwillingly, they both try to have a normal life, friends, and child. The novel opens when the 28-year-old Henry confronts with the 21-year-old Clare. At that critical moment Clare is a total stranger to Henry but, she knew him since she was six. Then, the story presents different flashbacks to Henry's childhood; when the 5-year-old Henry time traveled for the first time, when he was a teenager and finds out that the older version of himself who is teaching him how to survive during his time travels is not his friend but himself from the future, and when he learned that he cannot change the events that had happened in the past.

Throughout different flashbacks to the past, the reader became familiar with Henry and Clare's childhood. After they saw each other for the first time in Henry's chronology, Henry starts to travel to Clare's childhood in South Haven, Michigan. In one of his first visits, Henry gave a list of dates to the six years old Clare and she wrote them in her diary to remember when he would appear to her. Over time they developed a close relationship, and when they saw each other in the present time, they decided to get marry. After the marriage, they decided to have a child but Clare had trouble bringing a pregnancy to term because of the genetic disorder which was passed to fetus by Henry. After six miscarriages, one night a vision of Henry from the past showed up to Clare and made her pregnant. Finally, Clare gave birth to a baby girl named Alba. Alba had the same genetic disorder of Henry too, but fortunately she had more control about the destination of time and place.

In one of Henry's time travels to future and saw Alba and she told him that he is about to die when she is five years old. On New Year's Eve 2006 Henry time travels to the Michigan's woods in 1984 and got shot accidentally by Clare's Brother, Mark. Henry returns to the present and dies in Clare's arms. Clare became devastated and broken by Henry's death. Later she found a letter from him to stop waiting for him, but he also mentions a moment in her future when they would meet

again. The scene of the book pictures the moment when Clare is 82 and Henry is 43.

Niffenegger artfully uses the concept of time travel to picture the nonlinearity in the lives of Henry and Clare which catches the eye of the reader of the novel. Henry, who was born with nonlinearity in his genes, is prone to be considered as an individual who time travel through his past and future timeline. He is pictured by Niffenegger as the representation of postmodern man who lives in a nonlinear time and space. Henry was born with time travel genes but he tries to have a linear and normal life. Despite all the efforts, one day the 28-year-old Henry sees the 20-year-old Clare and she tells him that she knows him since she was six. From that moment, both Henry and reader find out that nonlinearity plays the crucial role of finding his wife and she gives meaning to his disordered life.

Nonlinearity is a situation that has a disproportionate cause and effect. To describe a phenomenon as 'nonlinear', one has to describe it by what it is not. When the 35-year-old Henry time travels to the past – to the childhood of Clare – he tries to explain the linear life and the strangeness of nonlinearity to the 6-year-old Clare:

You know how to use a tape recorder? . . . Okay. So you put in a tape and you play it from the beginning to the end, right? That's how your life is. Now for me, it's different. Because I am a time traveler, I jump around a lot from one time to another. So it's like if you started the tape and played it for a while but then you said Oh I want to hear that song again, so you played that song and then you went back to where you left off but you wound the tape too far ahead so you rewound it again but you still got it too far ahead. (Niffenegger, 2003, pp. 44-45)

The first time Henry time traveled, he realized that he cannot have any control over his time travels; therefore, he would have a nonlinear life because he cannot experience everything in a hierarchical manner. The author narrates the story from two points of view – Henry and Clare - and from different times and places. In the first chapter of the novel, the 28-year-old Henry finds out that he is about to time travel to the childhood of Clare and he is about to marry her in the future. According to what Niffenegger portrays from the postmodern man and postmodern life in this novel, Hayles chaos theory can be applied to it to explain the story to its readers. Hayles suggests that the nonlinear aspect of chaotic systems illustrate that past and future does not really exist. What has happened to Clare in the past, has not happened to Henry yet. Niffenegger describes a nonlinear life in Author's Note on the Tenth Anniversary of *The Time Traveler's Wife* as follows:

Imagine that you are living your life out of order: Lunch before breakfast, marriage before your first kiss. Conversations end suddenly and then begin in the middle. A cigarette appears half-smoked between your fingers. You come home from work one day and your infant is sixteen years old and sports a Mohawk. (p. xi)

Although Niffenegger introduced Henry as a time traveler, Clare has her own kind of Nonlinearity. Henry and later their daughter, Alba has the time travel genes and they can time travel to different times and places physically, but it does not mean that Clare is absolutely attached to her present time line. Throughout the novel, certain events and experiences turn Clare to a time traveler; a mental time traveler. For instance, in 1998 when Henry is 35 and Clare is 27, Clare's mother dies from cancer and her death breaks Clare down. Henry describes Clare as,

... and soon I leave her alone, afraid of the docile, tearless face that seems to be miles away. I miss Lucille, but it is Clare I am bereft of, Clare who has gone away and left me with this stranger who only looks like Clare. (Niffenegger, 2003, p. 333)

The author proposes that nonlinearity exists in Clare too, and it necessarily does not mean to happen physically. As Henry described Clare in the above passage, one concludes that an individual can exist in the present time physically but not mentally and emotionally. In Clare's case, her attachment to the past makes her a traveler; a kind of time traveler who remembers her past experiences too strongly that she forgets about the present and for her it is as though she has time traveled through time and places. Throughout the novel, the reader sees several parts that Clare describes herself as a time traveler too. For example, after Henry's death, she became increasingly

depressed and describes her mood as a past addicted, "Sometimes I wake up and reach for Henry. Sleep erases all differences: then and now; dead and living. I am past hunger, past vanity, past caring." (p. 513)

Niffenegger suggests that the obsession to the past events turns one into a time traveler. The best example of Clare's obsession to the past and her nonlinearity happens when Henry was dead and she was lamenting over his death; In July 2008 when Clare was lying with Gomez – His friend -, it appeared to her as if she had time traveled to her past, to the time that she was having sex with Henry for the first time:

I close my eyes. . . Henry. We are in the meadow. It's summer. A green blanket. We have just eaten, the taste of melon is still in my mouth . . . I've been waiting very patiently, Henry. I knew you'd come back sooner or later . . . Henry_ . . . I stare at myself in the mirror. My reflection looks lost and pale. What am I doing? What have I allowed myself to become? An answer comes, of sorts: You are the traveler now. (pp. 520-521)

One can conclude that memories of the two main characters can lead to their nonlinearities and therefore, physical and mental time travels. The memory raises serious questions about time and linearity in *The Time Traveler's Wife*: is Henry really dead if he is alive in Clare's memories. Alba – Henry and Clare's daughter – says that, "he is not continuously dead" (p. 382) and mentions the fact that his nonlinear life and time travels can even deny his death and he can exist after the time of his death. More importantly, the author presents the final chapter of the novel with the title of "Always Again" when the 43-year-old Henry appears to the 82-year-old Clare in 2053. Although the author tells to her reader that Henry is dead but, the final chapter raises this idea that this story lacks conclusion or a deterministic ending. This phenomenon is basically a feature of nonlinearity in the science of chaos which is the background of the new physics.

The concept of nonlinearity led Lorentz to discover that a small change would lead to a huge outcome. The so-called butterfly effect was introduced to the world in a paper named '*Does the flap of a Butterfly's wings in Brazil set off a tornado in Texas?*' in 1972. Lorenz was trying to construct meteorological models for forecasting the weather and they led him to this conclusion that slight variations in temperature, air pressure, humidity, or other features can lead to geometric impact upon the weather. Soon this discovery applied itself to other fields of studies such as mathematics, physics, chemistry, economy, and more importantly turned into a cultural fact. Before examining the sensitivity to initial conditions or the butterfly effect in Niffenegger's *The Time Traveler's Wife*, let us to have a brief look at the emergence of time travel stories.

According to Nahin in *Time Machines: Time Travel in Physics, Metaphysics, and Science Fiction* (1999) and *Time Travel: A Writer's Guide to the Real Science of Plausible Time Travel* (2011) the concept of time travel was first introduced to the world by Wells's *The Time Machine* in 1895. Generally, time travel stories focus on one's travels to the past or future and their consequences. Often, the main focus of the author is on the changing of history; a character changes the past either intentionally or by accident and when he returns home he finds out that his present time is different than before. Hawking in "Space and time wraps" suggests that the concept of time travel in postmodern fiction emerged from the scientific theory of general relativity; and they contain characteristics of chaos theory.

Nahin in *Time Machines* (1999) claims, "even though the consensus today is that the past cannot be changed, science fiction writers have used the idea of changing the past for good story effect." (p. 267) Changing the past led the writers to use the scientific concept of the butterfly effect. According to chaos theory it connotes that a small change would lead to a huge outcome. Dizikes in his article "The meaning of the butterfly" in Boston Globe suggests that this concept became very popular in literature and cinema; for instance, In Ray Bradbury's *A Sound of Thunder* (1952) and in the 2004 movie, *The Butterfly Effect*.

The importance of butterfly effect can be seen perfectly in Niffenegger's *The Time Traveler's Wife*. For instance, when the 36-year-old Henry time travels to 1988 and sees the 17-year-old Clare, they talk about the outcome of every small incident which happens and directs the course of their lives. Clare insists on changing a small event (adding a date to a painting which does not have that in Henry's present time line) and Henry answers: "I'll let you know if you've just caused World

War III.” (p. 104) But when Henry goes back to his present time line in 2000 he finds out that nothing has changed because Clare erased the date and let it to be in a way Henry described it to her. She says to him, “I got all freaked by your World War III comment. I started thinking, what if we never meet in the future because I insisted on testing this out?” (p. 105)

Niffenegger portrays Henry as a person who is already aware of this phenomenon and its consequences. In several parts of the novel, Henry warns his other self, Clare, and Gomez – his friend – not to try to change anything in the course of their lives because the outcome would be huge and unpredictable. Throughout the novel, Henry never changes anything in his time travels; he even does not prevent his own death although Clare begs him to change the course of events for once. As mentioned before, although most of the time travel writers focus on characters who try to change the course of events, Niffenegger preferred to take another kind of story, with another kind of understanding for her readers. She in *Author’s note on the tenth anniversary of The Time Traveler’s Wife* writes:

The device of time travel allowed me to tell the story of a good marriage in a way that made ordinary things worthy of special attention. In The face of obstacles, normal life is a triumph. Time travel can be read as a metaphor for memory: we are all time travelers in our minds, if not in our bodies. Like Henry, we jump back to moments of humiliation, loss, joy; we find ourselves flung seemingly at random to ordinary days, small unnoticed pleasures. Our present is created and shadowed by our past. We live in the present, blissfully innocent of our future. (p. xii)

One can conclude that the author only uses the notion of time travel to talk about the inherent nonlinearity within all human beings in 21th century. Unlike the previous understanding which used to emerge from Newtonian/linear thinking, nonlinearities are common in nature, they are not exceptions and do not need to be fixed. Time traveling is used to magnify the chaotic characteristics of individuals – nonlinearity – and to show how much the scientific notions, especially concepts from the new physics have emerged into society and culture of 21th century.

5. Conclusion

For many centuries literary critics, like their counterparts in the sciences, have followed the expectations of a culture that used to believe in a linear, cause-and-effect logic as the most productive form of analyzing the phenomena. In return, post-Einsteinian scientific discoveries showed that the linear thinking is not good enough to explain the complex world and its phenomena, and the world needs another kind of thinking. Nonlinearity led researcher Edward Norton Lorenz to the discovery of the butterfly effect. Henry who is aware that a small change would lead to a huge outcome, prevents himself, Clare, and their friends not to change anything in their lives. Although he knows certain events would lead to his death, he never does anything to change the course of events. Through Henry and Clare, the author wants to emphasize on the inherent nonlinearity of all the individuals in 21th century. It is true that no one can time travel physically but we all have the potential to turn into travelers of our own memories.

Studies of the mathematician Poincaré and physicist Einstein led the emergence of quantum mechanics and chaos theory. Hayles, who applied chaos theory into literary texts and culture, believes that the post-modern man is not experiencing his life in a linear manner. At another hand, Niffenegger’s *The Time Traveler’s Wife* which is about the life of a time traveler, Henry DeTamble and his wife, Clare Abshire, presents the idea of Hayles’ nonlinearity about the post-modern man. The novel generally presents Henry as a person who has a nonlinear life – because he time travels unwillingly and appears in places and times randomly. The reason behind Henry’s physical nonlinearity lies in the fact that he has nonlinearity of genes. Although the author suggests that to be a time traveler, one does not necessarily needs to time travel physically. Clare’s especial memories force her to forget about the real time and space. Niffenegger concludes that in general each individual has this ability to turn into a time traveler and it necessarily does not demand the nonlinearity of genes.

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