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DEPARTMENT OF ENGLISH



**Quantizing the Sixties:**  
**The Application of Quantum Principles as an Alternative Socio-  
Cultural Study of the 1960s American Counterculture**

A DISSERTATION SUBMITTED TO THE DEPARTMENT OF ENGLISH IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS FOR MASTER DEGREE IN CIVILIZATION AND  
LITERATURE

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**Academic year 2020-2021**

## ***Dedication***

*I would like to dedicate my work to my beloved parents, my family and my friends.*

*Thank you for everything*

## ***Acknowledgements***

*I would like to express my gratitude to my supervisor MR. Mihoubi for his tremendous support and encouragement.*

*A special thanks to the researchers and theorists for continuously pushing the boundaries of knowledge, this dissertation would not have existed without their revolutionizing discoveries.*

## **Abstract**

In recent years, Quantum Social Science has become the new trending notion for many physicists and social science theorists. The present study attempts to take part in the revolutionizing concept by quantizing the main socio-cultural structures that led to the rise of the 1960s American Counterculture. The reason behind the recent demand for the alternative notion is due to the limitations of the existing sociological theories like the Symbolic Interactionism and the Conflict Theory which seem to exhibit one-dimensional explanations that are seen as outdated and restricting. Consequently, this research attempted to employ the principles of quantum mechanics, Wave/Particle Duality, Superposition and Entanglement, to capture the multiple perspectives of the counterculture in a holistic and accurate manner. It strived to answer the research questions by constructing a theoretical analysis that detailed the most influential aspects of the counterculture. The present study applied the descriptive analytical method and used the qualitative approach to analyze the 1960s decade as a case study. By assimilating quantum principles, this dissertation made an attempt to offer better, more accurate analysis than those of classical sociological theories in regard to analyzing the structures that led to the popularity of the dynamic decade. Due to the complex, nonlinear nature of both systems, the study sought to parallel the socio-cultural system of the counterculture with the microscopic system of quantum mechanics; thus creating alternative approaches that offer nonrestrictive interpretations of structures like the duality of social movements and individual freedom, the superposition of hippies and activists, the entanglement of the collective groups of race and gender and the issue of the generation gap. This research is an endeavor to further expand the multidisciplinary area of research to the terrain of sociology and socio-cultural studies.

**Keywords:** Quantum Social Science; American Counterculture; quantum mechanics.

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## **List of Abbreviations**

**U.S:** The United States.

**WWII:** World War II.

**LSD:** Lysergic Acid Diethylamide.

**CIA:** Central Intelligence Agency.

**SDS:** The Students for a Democratic Society.

**FSM:** Free Speech Movement.

**CRM:** The Civil Rights Movement.

**NOW:** The National Organization for Women.

**ERA:** Equal Rights Amendment.

**TV:** Television.

## **General introduction:**

As a branch of Social Sciences, Sociology is initially constructed by broad historical paradigms that study social structures. These paradigms are represented by the main fundamental classical theories: Conflict Theory by Karl Marx (1818-1845) and Symbolic Interactionism by George Herbert Mead (1863-1931). These theories are the main pillars that modern sociological theories are based on, the two theories generally aim to explain social structures and seek social reformation through the process of analyzing the patterns of who we are and what our role is in the society we live in.

Indeed, classical sociological theories seem to provide limited one-dimensional explanations that seem to be outdated and focus on one aspect at a time. The either/or approaches they tend to operate do not fully represent the complexity and nonlinearity of human behavior and society. They struggle with analyzing and mapping the probabilities of contemporary socio-cultural issues and, therefore, fail to fully resolve them. The American counterculture of the 1960s, an important period in U.S history, is a great illustration of the theories' limitations; they do not reach deeper to search for more accurate explanations and better possibilities to identify social movements, the peruse of individual freedom and the generational disputes that occurred between the rebels and the conservatives. According to experts in Sociology, new alternative methods that capture all perspectives of social structures are required.

This research seeks to understand how individuals function in a given society. It aims to capture interactions in the socio-cultural phenomenon with the use of quantum mechanics; a science that studies the microscopic world in order to explain the ontological function of the macroscopic world. This will enable the analysis to not only focus on the structure of the American society during the 1960s, but it will dive deep into the collective

minds of its individuals using the main principles of quantum mechanics; Wave/Particle duality, quantum superposition and quantum entanglement. This application is an alternative approach presented by the new interdisciplinary field quantum social science. Unlike classical sociological theories, quantum social science has the ability to investigate all aspects of society in a simultaneous manner.

Over recent years, previous studies showed that the shift of quantum mechanics from theoretical physics to outside disciplines proved to have profound implications on their developments. The following books and articles discuss this shift to psychology, political science and economics. They introduce the newly presented field of quantum social science.

In their book *Quantum Social Science* (2013), professors Emmanuel Haven and Andrei Khrennikov present how quantum principles can be assimilated in psychology and economics. The authors provide a definition of classical and quantum mechanics as well as quantum social science, an emerging field of interdisciplinary research which draws parallels between quantum physics and social sciences. The book proposes a mathematical quantum-like approach as an alternative tool to enhance the structures of decision making in finance and economy. This book is written for the purpose of applying quantum theory and its principles outside of theoretical physics.

Moreover, in his book *Quantum Social Theory for Critical International Relations Theorists: Quantizing Critique* (2020) scholar Michael P. A. Murphy was the first to introduce Quantum Social Theory as an approach to unveil the complexity and unpredictability of critical International Relations. He argues that classical theories of social sciences are limited by determinism and lack the comprehension of what is imaginable. Adopting quantum mechanics into the world of social sciences, specifically international relations, offers the interesting perception of quantizing conceptual

paradigms. Murphy pursues his approach by translating and applying quantum concepts to the system of international relations. He argues that concepts-as-tools is an intriguing methodological innovation and is complementary to the field; thus quantum social science should exist in the work of international relations.

Critical theorists James Der Derian and Alexander Wendt also stated in their article “Quantizing international relations: The case for quantum approaches to international theory and security Practice” (2020), the possibility of implementing quantum approaches to transform and improve the political science field of international security. They argue that through new scientific discoveries, global entanglement is reachable and can help with the production and distribution of power and knowledge. The authors apply quantum methods to decode global political issues that are current and probable in the near future.

Although the previous studies discussed the use of quantum mechanics outside its main field of theoretical physics and into the domain of social sciences, their focus lied heavily on the political and economic aspects paying almost no attention to sociology and socio-cultural studies. This research is an addition to these discoveries; it opts to further these expansions to the terrain of sociology by presenting quantum approaches as alternative applications on the dynamic and impactful American counterculture of the 1960s. This will hopefully offer better accuracy than classical sociological theories in regard to providing holistic and precise interpretations of the sixties era from all socio-cultural aspects.

The main objectives of the research are as follows:

- To introduce alternative methods that focus on all aspects of American society in the 1960s instead of trying to provide explanations consisting of only either/or approaches.

- To structure an analytical approach that offers more accurate probabilities that correlate with the unpredictability of contemporary global issues facing societies.
- To further popularize the multidisciplinary study that merges physics, particularly quantum mechanics, with sociology and socio-cultural studies.

The following questions will be answered to achieve the objectives mentioned previously:

- To what extent can Quantum Social Science explain the socio-cultural aspects of the 1960s counterculture with better accuracy than classical sociological theories?
- What were the reasons behind the cultural and political differences that caused conflicts between the rebellious youth and the conservatives?
- Were the rebels drawn to individual self actualization or collective actions toward a bigger cause?
- How were language, race and gender big contributing factors in the rise and popularity of the revolution?
- How will Quantum Social Science explore the probabilities and possibilities of contemporary socio-cultural paradigms?

The research paper is an applied research; it will employ the descriptive analytical method and will apply methods from the domain of theoretical physics to conceptual areas of study that are concerned with the relationship between individual and society. The Qualitative approach and a theoretical framework are the main approaches used to create a link between quantum methods and the socio-cultural structure of the American society in the 1960s as a case study. The main instrument used is data collection.

This dissertation consists of three chapters. The first chapter is a historical background on the American counterculture; it will discuss the causes, developments and impacts of the rebellious culture. Moreover, the second chapter will start by introducing

the classical sociological theories that were used by historians to contextualize the sixties era. Then, it will provide a historical background and a definition of quantum mechanics with its three fundamental principles: Wave/Particle duality, Superposition and Entanglement. The chapter will also discuss the quantum shift from theoretical physics to social sciences and will introduce the interdisciplinary field of quantum social science. The last chapter will undertake the American counterculture as a case study by integrating quantum principles on the socio-cultural study of the decade. It will apply quantum social theories on the main aspects that lead to its rise, popularity and controversy. Each and every principle will explain certain lifestyles, movements, race, gender, language and individual as well as collective consciousness of the counterculture. Finally, the chapter will interpret the generation gap from a quantum-like perspective.

## **Chapter One: The 1960s American Counterculture**

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## Introduction:

The sixties in America carried different ranges of impactful events that contributed, and still contributes, to its society. The youth's counterculture had many influential factors that led to its emergence. Firstly, the study will tackle major events that had the most influence on the decade; from America rising as a global power after World War II and entering a strategic Cold War against the Soviet Union, to combating internal Communism and experiencing a social rift between the conservative majority and the alienated minority. In addition, this chapter will also demonstrate how both the bloodied war in Vietnam and Psychedelics ignited a chain reaction that created the rebellious counterculture of the 1960s. Moreover, the study will signify how Popular Culture played an important role in expressing the younger generation's will to demand for social change through various movements, organizations and, in a simultaneous manner, glorifying individualism over traditions through music, fashion and, television. Lastly, the chapter will demonstrate the gradual fall of the sixties counterculture with the contributing factors that led to the end of the controversial era.

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## 1.1. Definition of Counterculture:

The word counterculture is defined as “a way of life and set of ideas that are opposed to those accepted by most of society; a group of people who share such a way of life and such ideas” (Cambridge Dictionary ). It is a revolution that, generally speaking, stands in opposition to what is represented as conventionally dominant and mainstream; in other word, the dominant culture. The term was first popularized by social critic and historian Professor Theodore Roszak (1933-2011) in 1969 during his analysis of the youth’s rebellion.

Counterculture represents the detachment from the dominant culture through various socio-political and socio-cultural forms such as movements, media, literature, art and different types of protests for the purpose of changing the status quo. Although the instigation of countercultures generally starts from an opposing minority of a society, their influence leads them to become a significantly effective minority. Sooner or later, a counterculture becomes either the dominant culture or it simply fades away (Bennett).

## 1.2. The Rise of the 1960s American Counterculture:

Studies including the exploration of the 1960s counterculture began within the time period itself. Many historians, social theorists and analysts focused on the different aspects and events that occurred during the eventful period. Theodore Roszak was among the firsts to document the evolution of the counterculture, in his book *The Making of a Counter Culture: Reflections on the Technocratic Society and Its Youthful Opposition* (1969) Roszak came in contact with the young audience of hippies, rebels, anti-war activists and radicals. He concluded that the 1960s generation, although widely various,

## Chapter One: The 1960s American Counterculture

had the same principle ideals of rejecting what he called Technocracy<sup>1</sup>. His book is considered as a reliable primary source for many writings and investigations on the sixties era, it includes everything there is to know about the revolution of the youth and their disputes against their parents' generation.

### 1.2.1. Historical Background on the Counterculture:

This study tackles major influential conditions that formed and popularized the counterculture. Its development mainly consisted of three basic eras: the causes of its emergence throughout the late forties and early sixties; its formulation and rise during the sixties; and its "calm" fading era throughout the early seventies. The following events were arguably the most important factors contributing to the rise of the rebellious generation.

#### 1.2.1.a. The Cold War:

For many scholars and historians, it seems, the earliest impact on the sixties counterculture began with the end of World War II (WWII) (1939-1945). For America, it was a necessary war that led to the empowerment of the country's foreign political affairs. However, it also caused a rip through its internal social affairs. After defeating German dictator Adolf Hitler (1889-1945), America went into an ideological and a strategic clash with Joseph Stalin's (1878-1953) Soviet Union (1927-1953). The Cold War (1947-1991) caused the American government to fight any traces of what they called the Union's "red fascism" and combat Communism in its premises. The struggle created a state of the Red Scare<sup>2</sup> (Bach 21).

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<sup>1</sup>A political ideology and system of managing societies by technical, decision-making specialists

<sup>2</sup>Hysteria of mass panic in the U.S caused by the perception of communists during the Cold War

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Historians believed that the Cold War caused a rift in American society. The older generation saw stability and dominance of values, traditions and conformity; while the younger generation experienced a sense of alienation and dysfunction caused by the establishment. History Professor Terry H. Anderson (1946- ) explained this alienation in his book *The Movement and the Sixties* (1995) by stating that the reason for the rise of the youth's rebellion was the inconsistencies, wars, conformity and the dominance of the patriarchic government (Anderson 35). The sense of alienation led to the creation of the late forties and fifties' Beat Movement.

### 1.2.1.b. The 1950s Beat Generation:

Also known as the "Beatniks", the Beat generation was an American social and literary movement created by poets and activists Jack Kerouac (1922-1969), Allen Ginsberg (1926-1997) and William S. Burroughs (1914-1997) during the late 1940s throughout the early 1960s. Their movement was centered on the ideals of spirituality, individual freedom and alienation from the mainstream "square"<sup>3</sup> society. The Beats advocated for spiritual awareness and sexual liberty through their writings, especially in poetry. Allen Ginsberg's poetry book *Howl* was the most accurate embodiment of the beat movement, its publication in 1956 aligned perfectly with the rise of the movement's social and cultural relevance. Style wise, the Beat generation consisted of bohemian artist communities<sup>4</sup>. They adopted their style and vocabulary from associations with Jazz music and artists, which is apparent in writings like Kerouac's *On the Road* (1957) (The Beat Movement).

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<sup>3</sup>Conventional and restrictive

<sup>4</sup>Communities of unconventional lifestyle and practices

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The sense of alienation and opposition against the American establishment generally began with the Beat generation whom were the first youth to experience WWII's effects. The Beatniks did not fully support the radical ideologies of the 1960s generation, notably Jack Kerouac who did not agree with its appeal. Their dark, moody and jazz-loving characteristics did not match the bright, ecstatic and edgy crowds of the next generation. However, many of them did indeed shift to being hippies and immersed themselves into the 1960s youth's counterculture. Their liberated spiritual lifestyles, the influence of their writings as well as their movements to reject the conformity of Cold War American society were factors that influenced and foreshadowed for the emerging counterculture (Bach 53).

### **1.2.1.c. The War in Vietnam:**

After falling under the rule of communist leader Ho Chi Minh (1890-1969) in 1954, Vietnam, a country in Southeast Asia, was divided into a north communist area supported by the Soviet Union and a south non-communist area supported by the United States and its allies. Ho ordered terrorizing acts against the non-communists which led to a war breaking in the country, this alerted American leaders who set national and international policies to "contain" the spread of communism. American weapons, advisors and aids were shipped to south of Vietnam during the 1950s and early 1960s by American president Eisenhower (1890-1969) and later president John F. Kennedy (1917-1963) in fear that communist China might take over Southeast Asia and, eventually, spread communism all across the world (O'Callaghan 125).

Following Kennedy's assassination in 1963, his vice president Lyndon B. Johnson soon assumed the presidency. In June 1965, U.S. involvement escalated when Johnson ordered American military combat units consisting of 82,000 troops into battle in South

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Vietnam. By November 1967, around 500,000 American troops were fighting in Vietnam with more than 15,000 dead and 109,527 wounded. The war caused physical, emotional and financial turmoil to all participants. Around 3 million were killed with more than half being Vietnamese civilians and over 58,000 Americans which created widespread tensions and divisions between the U.S government and the people. Many were watching the televised horrors in their homes which led to the start of anti-war movements and protests against the American government. Under the increasing pressure, President Richard Nixon withdrew his soldiers from Vietnam in 1973. Two year later, the war ended with a truce and Communist forces succeeding in unifying the country as the Socialist Republic of Vietnam (Vietnam War).

### 1.2.1.d. LSD, the Rise of the Psychedelic Culture:

Initially synthesized by Swiss chemist Albert Hofmann (1906-2008) in 1938, Lysergic Acid Diethylamide, or LSD, is a hallucinogenic drug that was introduced for various psychiatric uses. Hofmann only discovered the effects of LSD four years later in 1943 when he accidentally ingested the drug which made him experience what he described as “extraordinary shapes with intense, kaleidoscopic [multicolored] play of colors” (LSD). Days later, the chemist tried a larger dose on April 19<sup>th</sup> and rode on his bicycle in which he experienced the fist acid trip.

During the 1950s and in the midst of the Cold War, the Central Intelligence Agency (CIA) created a program called the project MK-Ultra. The program was concerned with conducting mind control and information gathering experiments using hallucinogenic drugs including LSD. The agency believed that LSD could be weaponized for psychological advantages in the Cold War. However, the drug was not medically

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<sup>5</sup> Bicycle Day, a celebration of the discovery of LSD

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approved due to its unpredictability and ambiguous effects such as hallucinations and unpredicted behavior with lasting effects from 30 minutes up to 8 hours, sometimes days. Project MK-Ultra was not public knowledge until in the 1970s when the scandals of its experimentations caused a public shock with many lawsuits and investigations (Jenkins).

LSD was not quite popular during the 1940s and 1950s; it only started gaining recognition in the early 1960s when American novelist and counterculture figure Ken Kesey (1935-2001) popularized the drug he volunteered for testing in the MK-Ultra experiments. The author of the 1962 novel *One Flew Over the Cuckoo's Nest* advocated LSD to his followers by throwing parties, which he called "Acid Tests". The parties included musical performances combined with people taking the drug and going on acid trips. Kesey's raves grew more and more popular as well as the LSD intake among the younger generation. The drug soon became a symbolic token for the rise of the psychedelic counterculture of the 1960s even after it was taken off the market in 1965 and eventually outlawed by the American federal government in 1968 (LSD).

### 1.3. The Sixties' Generation Conflict:

American musician Bob Dylan (1941- ) was among the major counterculture figures that influenced the young generation of the sixties and expressed their conflicts with their conservative parents. The Nobel Prize winner wrote a song called "The Times They Are A-Changin'" (1965). It describes how the younger generation of the 1960s demanded change by redefining their parents' traditional values and old ideals on their own terms, "Come mothers and fathers throughout the land and don't criticize what you can't understand. Your sons and your daughters are beyond your command. Your old road is rapidly agin'. Please get out of the new one if you can't lend your hand, for the times they are a-changin'" (Dylan). Dylan's music spoke a rhymed truth that resonated

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with the young people whom were opposing the mainstream culture and creating their own counterculture.

Many artists, like Dylan, captured the themes of the rising revolution. The period witnessed a breakdown of the 1950s norms, particularly among the young. High school and college students dropped out in favor of becoming political activists, freedom seekers or simply to “enjoy the moment”. Although they were a small percentage of American society, the young rebels and hippies began to openly shun the establishment they were brought up in and its conventions of adapting to materialism, racism, and inequality (The Emergence of a Counterculture).



Fig1.“Woodstock Youth”. Photograph. N.D. Counterculture. *Lumen Learning*. Web. [courses.lumenlearning.com/boundless-ushistory/chapter/counterculture/](https://courses.lumenlearning.com/boundless-ushistory/chapter/counterculture/). Accessed March.2021.

As previously mentioned, the decade saw a split between those who believed their shared traditional American values were the foundation of a stable life and those who believed freedom of expression was essential and war was never the answer. First, it is worth noting that the majority of the American society consisted of conservative patriots; “America: Love It or Leave It” was their famous slogan, they were mostly white middle

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class people who believed in conformity and patriotism after fighting and defeating those who did not share their political, economic and social beliefs in WWII. This was the generation that survived the Great Depression (1929-1933) and advocated for the stability that post-war America provided. The older generation also believed in the American Dream of working hard to achieve a good job and an established home. For mainstream Americans, traditional values with clear gender division were highly regarded; men were expected to be well groomed with the standard role of being the sole providers for their families, while women were assigned the role of the house wife who cooks, cleans and raises the children while being well dressed with minimal amounts of makeup and modest clothing (The Emergence of a Counterculture).

Unlike the conservatives, the emerging generation of the 1960s, also called baby boomers, hippies, longhairs, freaks and other names, believed that post-war America brought a sense of alienation to their lives. The young rebels, although a minority, became a major social and political challenge to the dominant American society. Students, dropouts, hippies, juveniles, artists, political activists, rebels and revolutionists; they were the ones who wanted to change the consensus and alter conventions. The so called Love Generation created an unprecedented range of movements that did not rely on leaders to make their voices heard. They advocated for individual freedom without hierarchy and believed in “doing your own thing” (Bach 59).

One hippie declared, “Human beings need total freedom. That’s where God is at. We need to shed hypocrisy, dishonesty, and phoniness and go back to the purity of our childhood values” (The Emergence of a Counterculture). Just like the quote entails, the opposing youth sought widespread pursuits by rejecting all that is conventional seeing it as fake and started demanding for transparency from the government and living life without hypocrisy. Their pursuits came in many ways such as political activism, art,

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hedonism<sup>6</sup> , drugs, radical rebellions and more, thus creating a counterculture that emerged in the early sixties and continued well into the early seventies.

Roszak commented on the rising generation saying “For better or worse, most of what is presently happening that is new, provocative, and engaging in politics, education, the arts, social relations (love, courtship, family, community), is the creation either of youth who are profoundly, even fanatically, alienated from the parental generation, or of those who address themselves primarily to the young” (Roszack 11). What Roszak depicted was that cultural, social and political change seemed to generally stem from the alienated youth who do not accommodate their parents’ way of living. This sense of alienation brings about a sense of revolutionizing what is conventional, for better or for worse, in order to “fit in” and find a place in the newly shaped society.

The result of criticizing the dominant establishment that was generally accepted by the mainstream adults created a growing conflict between the two contradicting generations called the generation gap. Roszak commented on the growing dispute saying “. . . it grows to be the common expectation that the young should be those who act, who make things happen, who take the risks, who generally provide the ginger” (Roszack 11). According to the author, the younger generation shared attitudes and behaviors that are different from their conventional parents. They are the ones who created the inevitable change.

The rebellious minority had extensive media coverage that displayed to the mainstream generation how these longhaired, unmaintained youths expressed their beliefs and criticism of the existing establishment. To their parents’ dread, the young rebels

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<sup>6</sup>The pursuit of pleasure; sensual self-indulgence

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started to run away from their homes and drop out of their schools in order to follow their favorite bands and festivals as well as joining anti-war marches and social movements.

### 1.4. The Impact of the Counterculture:

The decade of the sixties counterculture played a great role in shaping and re-defining American society. Whether good or bad, the eventful period had a substantial impact on the socio-cultural structure of the country, during and after its decline in the seventies. The following events were considered the most influential scenes on the dynamic counterculture.

#### 1.4.1. The New Left, a Political Culture:

Ever since their independence in 1776, American people have continuously demonstrated their political opinions publicly as an act of exercising their first amendment which entails freedom of religion, speech, press, assembly, and petition. These demonstrations fall under the term “political culture” which refers to political beliefs, attitudes and factors that exist in a society. These factors are initiated by collective mentalities that share certain emotional and intellectual grounds which uniquely contribute to the status of their society (Davis).

A political culture did indeed emerge during the sixties under the name of the New Left; the term was popularized in 1962 by a group of University of Michigan students who created an organization that reconstructed the ideals of the old left<sup>7</sup> and criticized bureaucracy's hold on public institutions, specifically universities. The organization of student activists emerged in 1959 under the name of The Students for a Democratic

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<sup>7</sup>The pre-1960s Marxist left-wing in the western world

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Society (SDS). Students initially called for individual and social freedom taking inspiration from movements like the Civil Rights Movement (1954-1968).

After the U.S involvement in the Vietnam War, the SDS gained momentum for speaking against the war and the drafting of students. Sit-ins, protests, confrontations and marches on and off campus, such as the national march on Washington, D.C. in 1965 which gathered nearly 25,000 people, led to the spread of the SDS to other universities around the country as well as the formation of the Free Speech Movement (FSM) in 1964. The FSM came as a response to the banning of students from exercising their freedom of expression on the campus of the University of California. Thousands of students joined the movement and shut down the campus for weeks until the ban was eventually lifted (The Emergence of a Counterculture). By 1969, the SDS organization split into many sectors, some became more radical and were even involved in terrorist activities, while others remained loyal to the civil rights movement as well as speaking about third world issues. However, after the American retreat from Vietnam in the mid-1970s, the organization's activities came to an end (Davis).

### **1.4.2. Black Americans and the Civil Rights Movement:**

Although slavery was officially abolished in 1865 after the Civil War (1861-1865), racial oppression and injustice still followed black people in America. Between 1889 and 1946, around 4,000 black men, women and children were lynched by white mobs in the south. Black people were seen as inferior, lazy and sometimes even undeserving of human rights. In addition, Public institutions and facilities were racially segregated leaving black Americans with little to no power or civil rights, over 50% of black households lived below the poverty line (Bach 56).

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Although segregation in public schools was lifted in 1954, the first African-American student to enroll in the University of Mississippi James Meredith was admitted under the protection of authority against angry white rioters. Many more occurrences in the fifties involved black people demanding and being attacked for their civil rights. One famous incident of the fight for racial equality was that of the Montgomery bus boycott in December 1955 where African-American woman Rosa Parks was arrested for refusing to give up her bus seat to a white man. The boycott gained attention among activists, both black and white which, in terns, popularized the Civil Rights Movement led by the young black minister Martin Luther King, JR (Civil Rights Movement). Throughout the 1950s and into the mid-1960s, black people and their white allies started protesting and marching for their rights<sup>8</sup>. The movement resulted in President Johnson signing the Civil Right Act of 1964 and the Voting Rights Act of 1965 (Bach 65).

Initially, the protests started peacefully. However, racist white Americans assaulted and beaten the activists and assassinated the movement's leading figures Malcolm X in February 21, 1965 and Martin Luther King, JR in April 4, 1968 .These acts of aggression agitated many young activists who went to protest these racial inequalities among other social and political movements during the years of the 1960s counterculture (ibid).

### 1.4.3. The Second Wave of Feminism:

The Civil Rights Movement and other organizations such as the SDS were key components of the rise of social awareness. However, activist women of the sixties expressed their concerns that although these movements and organization spoke about

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<sup>8</sup>The march from Selma to Montgomery, Alabama in 1965

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racial issues and errors of conventional American society, not many paid attention to gender inequality and the problems faced by women in a predominantly patriarchal environment (Challenging the Status Quo).

Inspired by the movements and national protests, many women united to create their own movement demanding gender equality and criticizing the 1950s traditional roles of the stay-at-home wife. These concerns and criticisms were combined in the 1963 best-selling book *The Feminine Mystique*, by feminist writer Betty Friedan (1921-2006). The book discussed the importance of female individualism and identity as well as raising the collective consciousness of women around the country. By the year 1966, the National Organization for Women (NOW) was assembled and organized by feminist activists like Friedan. They demanded for the same freedom and rights granted to American men. Consequently, the organization caused the launching of the second wave of feminism. The movement's goal was almost achieved in 1972 when their constitutional Equal Rights Amendment (ERA) was being considered by the U.S congress, however, because of the many oppositions from the conservatives; the ERA did not pass as a constitutional amendment and has yet to be today (ibid).

Still, the second wave of feminism was in full action during the 1960s and early 1970s. The NOW kept on promoting equal rights for women while more feminists turned radicals in support of their cause. A famous example is the staged Miss America event created in 1968, New Jersey where the radicals crowned a sheep the title and threw stereotypical feminine clothing and products as a way to protest the exploitation of women by society. This was reported by media across the country as the "bra burning" event (ibid).

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### 1.4.4. The Sixties Popular Culture:

Rock music, festivals and partying, those were the pillars that characterized the youth's culture in the 1960s. The decade was, arguably, one of the most creative periods in modern America's history. Popular (Pop) culture dominated, Rock & Roll was a way of life, drugs were tools for spiritual renewal and ditching traditional lifestyles was a way to cope with the frustration and mistrust over the government.

Music became a way to protest social conventions. Rock Bands like The Rolling Stones, The Beach Boys, The Who, Pink Floyd and musicians like Jimi Hendrix, Bob Dylan and Marvin Gaye wrote songs that spoke directly to the protesting youth and reflected the decade's social and cultural uprising. Within ten years, music witnessed a birth of many genres and a fast change of pace in pop culture. Among the most influencing bands of that time was a British band called The Beatles, since their 1964 arrival in America; the music scene transformed dramatically, millions of young fans became hysterically attached to them to the point where the media nicknamed their influence "Beatlemania" (1960s Music: What Songs Were The Most Popular?).

Festivals were also a big part of the 1960s counterculture, many crowds of the partying hippies, drop-outs, activists and peace lovers gathered in record-breaking festivals that would go on for days. The 1967 Summer of Love held as many as 100,000 people in San Francisco. Similar to that was the Bob Dylan performance which drew 200,000 people to the Isle of Wight for a two-day festival. However, all of the festivals seemed trivial against the 400,000 people that gathered for the famous Woodstock music festival. The 1969 music event was so packed with people that the performances did not reach most of them. Nevertheless, the experience of being there seemed to hold peak

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interest of the younger generation. Experimentations with psychedelic and hallucinogenic drugs, such as marijuana and LSD, promiscuous sexual acts and total freedom to be and do whatever led to the rise of the undeniable culture that re-defined all that seemed restricting. “Woodstock declared that a young generation could take on the issues of personal freedoms, stopping an unjust war, creating respect for the planet, and work for human rights,” said Woodstock promoter Lang (Lebo).

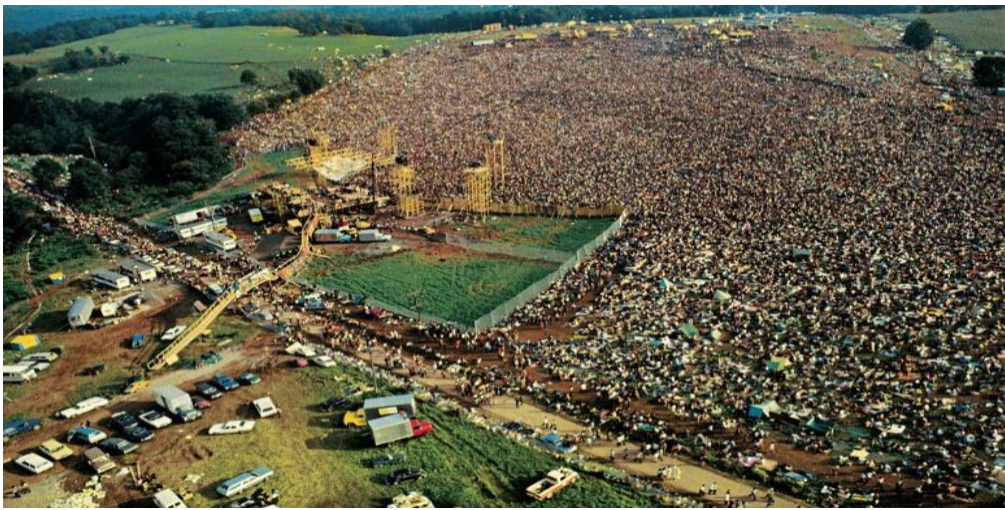


Fig.2. An aerial photo of the 1969 Woodstock festival. Photo. N.D. *Woodstock* [www.woodstock.com/](http://www.woodstock.com/). Accessed March.2021.

Fashion wise, the decade began with a 1950s-inspired conservative fashion. However, that soon changed during the mid and late 1960s when the long-haired youth wore bright clothing and sandals with accessories inspired by nature and peace. In 1967, women wore short skirts shunning the conventions of decent clothing, while men dressed in jeans and colorful tie-dyed T-shirts neglecting suits and proper attire. Many of the rebellious youth chose to grow their hair, give up on shaving and pay little attention to hygiene. By 1968, fashion focused more on individualism by applying the phrase “do your own thing”, people created their own unique looks and styles to match their personalities (1960s Fashion: Styles, Trends, Pictures & History).

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In the same way, the world of television was revamped when colored television (TV) screens became a popular purchase in 1964. Shows like *Bewitched* (1964-1972), *A Family Affair* (1966-1971) and *The Dick Van Dyke Show* (1961-1966) were some of the most successful TV shows that American families watched daily (1960s TV Shows: What Did People Watch?). However, TV networks broadcasted their shows based on the viewing masses of the white, conservative families. Censorship was dominant during the decade of the sixties; topics that indicate anything beyond the values of the white middle-class were avoided. Racism and sexuality were hardly ever broadcasted and minorities were generally excluded because they did not fit into the networks' viewing audiences. Throughout the seventies, censorship drastically changed due to the shift of the viewing audience from strictly conservative to a more accepting and open-minded, now older, generation of baby boomers. Restrictions of censorship loosened as the networks' targeted viewers changed (Worringham et Buxton).

### 1.5. The Seventies, the End of an Era:

The year 1969 demonstrated the peak of a cultural revolution for apolitical hippies, new leftists, civil rights activists and everyone who believed in the idea of "live and let live". Woodstock became a cultural landmark that described the counterculture's impact on American society during the sixties and in the future, Barry Levine, who photographed the festival, said "what Woodstock represented, and what it still represents today is hope" (Lebo). This newfound hope was embodied into the ideology of social change.

With the emergence of the new decade, radicalism was also at its highest peak. The SDS split created a radical group called the Weathermen; the group did not agree with the apolitical hippies describing them as "escapists". While festivals still continued, they became grounds of violence and chaos with people fighting each other and many

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experiencing bad LSD trips that led them to the emergency rooms. The Rolling Stones lead singer Mick Jagger expressed his views on a concert that ended in violence saying “There was no love, no joy . . . In 24 hours we created all the problems of our society in one place: congestion, violence, dehumanization” (Lewis).

Furthermore, in 1971 cult leader Charles Manson and his followers were convicted of the murders of American actress Sharon Tate and others. The case shook the entire country as the media associated Manson with hippies and led people to view them as violent and uncontrollable. In the same year Time Magazine proclaimed, “Too many hippies. We can only afford so many people alienated from society” (Bach 228).

In politics, President Richard Nixon became very unpopular among the revolutionaries and the anti-war activists. In 1968, Nixon planned to withdraw American troops from Vietnam gradually in a policy he called Vietnamization<sup>9</sup>. However, his executive order to bomb neutral Cambodia in 1970 made the youth feel betrayed which led to more protests erupting. Hundreds of thousands of college students all over the country demonstrated strikes on their campuses, this led to police interfering and opening fire on the students. After the firing, many marched to the White House and around 500 campuses were closed. Nixon’s disregard of the police brutality angered the youth and the country was profoundly divided. Many of the apolitical hippies turned to politics by endorsing and supporting the Democratic Party, this also coincided with Nixon’s Watergate scandal<sup>10</sup> that led to his resignation in 1974 (Bach 232).

Economically, the country entered inflation in 1973. Prices started doubling which caused a rise in unemployment and pushed the rebels to search for jobs. Their

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<sup>9</sup> President Nixon’s policy of withdrawing American troops and transferring the direction of the war effort to the government of South Vietnam

<sup>10</sup> The infamous political scandal in the United States involving the administration of U.S. President Nixon from 1972 to 1974 that led to his resignation

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counterculture began to lose its momentum and started to fade as a result to its commercialization, Capitalism had a hold on it by making the movement more of a mainstream than an opposition which lost the interest of many, Gregg Kilday of the Los Angeles Times argued that: “. . . Dope was cool. Sex was easy. Rock no longer threatened. No one was marching anymore” (Bach 299).

When the seventies dawned, some hippies turned to nature and became environmentalists, while others sought adventures by roaming outside America like the Middle East. The ones who stayed in the U.S, however, experienced a state of urbanization, where dropouts and teenage runaways returned to their homes while others took government benefits such as food stamps and welfare. Many young people did not commit to living the hippie lifestyle for any longer, it became more of a fashion statement and a trend. In 1974 after American involvement in Vietnam ended by a truce with North Vietnam, the era of revolution came to a halt as a result of consumer culture, media, crippling economic decline and an aging generation that decided to settle down.

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### Conclusion:

This chapter was a historical description of the 1960s American counterculture. It defined the term counterculture and described the main events that led to the creation of the sixties rebellious revolution. From the Second World War and the emergence of the alienated beat generation to the notorious war on Vietnam and the rise of the psychedelic movement, the sixties generation demonstrated an unprecedented opposition of their parents' conventions and conformity towards their government. Moreover, this chapter highlighted the rise of various social movements, the increasing growth of hedonistic practices and the impact of popular culture on the youth. Finally, the study depicted the main reasons behind the gradual downfall of the counterculture in the early 1970s.

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### **Introduction:**

This chapter will introduce the two main classical sociological concepts, Mead's Symbolic Interactionism and Marx's Conflict theory. It will demonstrate how both perspectives operate within the context of the counterculture through previous academic studies. In addition, the study will also display the theories' limitations and inconsistencies that call for better alternative solutions. Furthermore, this chapter will provide a historical background of quantum mechanics. With the beginning of the twentieth century, physics witnessed major fundamental developments that revolutionized its structures. From classical Newtonian ideologies, the discipline was divided into macroscopic physics and microscopic theoretical physics based on quantum theory. This contextual note is for the purpose of introducing the main subject of the study which is quantum mechanics. The chapter will focus on the historical emergence of quantum mechanics starting from the problem of light, Planck and Einstein's revolutionizing discoveries and the formulations of Schrödinger and Heisenberg. It will define quantum mechanics and its fundamental principles that will be used for the analysis in the next chapter. Also, the chapter will offer an explanation on the quantum shift from physics to outside disciplines. Finally, this chapter will provide a definition on the newly presented interdisciplinary field of quantum social science along with its development and importance.

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Before discussing quantum mechanics and the many expansions of quantum-like interpretations into the various fields of social sciences, the current study will first introduce the sociological theories that undertook the socio-cultural study of the sixties counterculture. The following paragraphs will define the major theories, their conceptualizations of the counterculture and the limitations they seem to exhibit.

### **2.1. Classical Sociological Theories:**

Within the context of sociology, the definition of counterculture has been conceptualized by academic writings as a model of social change, in this case the revolution of the middle class of the 1960s counterculture, with means derived from two primary theoretical perspectives: the Symbolic Interactionist perspective and the Conflict Theory perspective. These paradigms are the pillars by which sociological studies stem from (Three Major Perspectives in Sociology).

#### **2.1.1. Symbolic Interactionsim:**

The symbolic interaction perspective operates on the micro-level of society, it considers the symbols and details of how people interact and communicate with each other. American philosopher George H. Mead (1863–1931) introduced this perspective in the 1920s, he argued that people are connected through attaching meanings to symbols; these symbols come in forms of spoken words, conversation and communication by which people subjectively interpret them. Symbolic Interactionists focus on how individuals act based on the interpretation of symbols (Three Major Perspectives in

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Sociology). This sociological perspective was used by many writings concerning the American counterculture, historians and authors demonstrated how the phenomenon of the sixties counterculture was primarily a purist form of self-indulgence and anarchy made by a generation of hippies who wanted to challenge the standards of American society. Many interpretations of the generation's language, behavior and style were variously analyzed through documented findings from that era.

### **2.1.2. Conflict Theory:**

The conflict perspective stems from the notion of German philosopher Karl Marx (1818–1883) on class struggles and how the elite have control over the rest of society. The conflict theory focuses on class struggles and aims for social change by creating a radical revolution. Moreover, conflict theorists interpret social conflict in terms of inequality that exists in politics, economy, religion, race, gender and so on (Three Major Perspectives in Sociology). The perspective was especially popularized in the 1960s during the rise of the counterculture that consisted of political, social and cultural movements rejecting all sorts of injustice and inequality as well opposing traditional, class-based systems. This perspective is largely presented in counterculture renderings, where the phenomenon was described as a combination of movements, organizations, protests and riots created by the middle class youth who demanded for radical changes of the American society.

### **2.2. Challenges and Limitations of the Sociological Perspectives:**

Both perspectives offer certain outlooks on the general concept of society and its individuals. However, each theory suffers from various limitations that effect the

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identification and comprehension of social systems such as the counterculture. Mead's Symbolic Interactionism is criticized for focusing on individual interactions while neglecting larger components of society, the perspective's micro approach leaves out interpretations of what society consists of other than micro interactions (Three Major Perspectives in Sociology). As an example, this can be seen in the sixties media's focus on the apolitical hippies. One-on-one interviews were taken from media outlets and interpreted for analytical results that generalize the counterculture as a rebellion with no cause, leaving out other important factors that contribute to understanding all perspectives of the social phenomenon. History professor Damon Bach of Texas A&M University stated in his PhD dissertation "...historians over the next three decades disregarded that definition [counterculture], defining it as the cohort of cultural dissidents who eschewed [abandoned] political activism in favor of individual pursuits and personal liberation" (Bach 6).

As for Marx's conflict theory, counterculture studies that employed the class-based perspective seem to mainly focus on the socio-political movements and organizations of the sixties' generation. Critics of the conflict perspective argue that it views society from an overly negative manner. The theory suggests that societies are constructed through a capitalist system that controls all their aspects (Three Major Perspectives in Sociology). Although this perspective does describe issues faced by social systems, it still radicalizes them in a holistic manner and also offers radical solutions that advocate for extreme changes. From the context of the counterculture, the conflict perspective was a very popular sociological theory used by historians and writers who contextualized the counterculture solely based on the movements and organizations of the middle-class youth, namely the SDS organization and its actions.

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The issue here is the separation between both theories. As previously mentioned, there is disagreement on the contextualization of the counterculture. Some historians base their studies on one theory, while others define the decade based on the other perspective. Consequently, they seem to only provide linear, one-dimensional explanations on certain parts of the entire structure. This study observed that previous academic renderings of the 1960s counterculture seemed to conflict each other and struggle to analyze the causes, reasons and the mentalities of the era's generation; some studies argue that the sixties were one big movement of anarchy, complete hedonism and apolitical pacifism, while others believe that they were times of social change with revolutionary socio-political ideologies. These confictions are based on the either/or Newtonian approach used in large-scale ontological studies that produce divided knowledge which does not fully represent the complexity and nonlinearity of human behavior and the function of society. Therefore, new alternative methods of research that capture all perspectives of social structure are required in the field of sociology and sociocultural studies.

### **2.3. Historical background of Quantum Mechanics:**

Despite many speculations, the actual birth of the quantum theory, now actualized as quantum mechanics, dates back to the publication of German physicist Max Planck's papers on the Thermal Radiation Formula (1900). Planck's theory demonstrated that radiant energy is composed of undivided components called Quanta<sup>11</sup>, his discovery introduced quantum theory (The birth of quantum theory). In order to define quantum mechanics, it is essential to explain its origins and how it came to exist, starting with the debate of pre-quantum physicists whether light was waves of particles.

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<sup>11</sup>Plural of quantum, discrete undivided natural packet of energy and other physical properties

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### **2.3.1. The Problem of Light:**

Before quantum mechanics, there was a major debate among physicists concerning the nature of light. Some, influenced by English physicist Isaac Newton (1647-1727), argued that light consisted of particles called Corpuscles. Others, however, argued that it functioned as waves. English Polymath Thomas Young (1773-1829) demonstrated through several experiments that light behavior indicated wavelike tendencies (Squires). These conflicting discoveries posed a significant problem for classical mechanics. Was light a wave or stacks of particles?

### **2.3.2. Einstein and Planck:**

By 1900, Max Planck (1858-1947) discovered the world of quantum. Planck's work was the foundation for quantum theory. His discovery won him the Nobel Prize for Physics in 1918 and opened the doors for PhD student Albert Einstein (1879-1955) to revolutionize classical mechanics. In 1905, Einstein was set to further develop Planck's theory. In one of his published PhD papers "Heuristic Point of View Concerning the Production and Transformation of Light" (1905), he proposed through several experiments that light is indeed composed of chunks of particles. Four years later, Einstein discovered the groundbreaking result that small amounts of energy will appear as particles when measured but mathematically move as a wave with absence of measurement (Bembenek).

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By proving that light is indeed quantized<sup>12</sup> and behaves both as a wave and particles known as Photons<sup>13</sup>, Einstein's discoveries along with Planck's theory marked the beginning of the new realm of physics that is quantum mechanics. Einstein concluded that "It is therefore my opinion that the next stage in the development of theoretical physics will bring us a theory of light that can be understood as a kind of fusion of the wave and emission [particle] theories of light" (Rigden). In the next two decades after their discoveries of the quantum world, Einstein and Planck as well as other contributors, including de Broglie who proved mass is also quantized, focused on revolutionizing physics by trying to make sense of the wave/particle duality, modeling the atom and other applications (Singh 7).

### 2.3.3. Schrödinger and Heisenberg:

Throughout the 1910s and well into the 1920s, there were confusions on the application of quantum theory and its mixed results. Physicists and historians called this phase "the old quantum theory". By 1926, theoretical physicists Erwin Schrödinger (1887-1961) and Werner Heisenberg (1901-1976) went to reformulate the old quantum theory by correcting its ambiguities and confusions. Heisenberg's publications and mathematical formulations awarded him the 1932 Nobel Prize in Physics for the creation of quantum mechanics. Similarly, Schrodinger's Wavefunction equation<sup>14</sup> has brought back the success the old quantum theory strived for without the inconsistencies which also won him a Nobel Prize in Physics in 1933. Both Heisenberg and Schrödinger's works

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<sup>12</sup> From quanta: to express something in terms of quantum mechanics.

<sup>13</sup> Elementary particles theorized by Albert Einstein in 1905, they represent the quantum of light.

<sup>14</sup>It represents the mathematical description of the quantum state of an unobservable quantum system. It describes the probability of the particles properties by Schrödinger's famous wave equation.

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predicted the same experimental outcomes that led to a reformulation of the microscopic world of particles and photons (The Nobel Prize in Physics 1932). Unlike the old quantum theory, Schrödinger and Heisenberg's contributions modified the features of the quantum world instead of only trying to revolutionize them. Their era marked the true rise of quantum mechanics (Ron).

### 2.4. Definition of Quantum Mechanics:

Quantum mechanics is a branch of theoretical physics that accounts for the way the world on the large scale by describing how it functions on the smallest scale. It deals with the behavior of matter and light on the atomic and subatomic level by defining atoms, their properties and the interactions of their elements such as electrons, protons and even the smallest undivided microscopic particles (Squires). The term "quantum mechanics" was first coined by a group of physicists including Werner Heisenberg, Wolfgang Pauli and was first used in the publications of German physicist and mathematician Max Born (1882-1970) in 1924 who also formulated the essential aspects of quantum mechanics in its matrix<sup>15</sup> version (Galles). The branch underlines how very large objects and cosmological events such as planets, stars, galaxies and black holes can be analyzed and explained through the study of the smallest fundamental elements that comprise them.

Although its concepts can be widely controversial and frequently conflicting with common-sense and rational thinking, quantum mechanics does not seek to understand

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<sup>15</sup>Sets of numbers arranged in rows and column.

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how things should work, but rather how they actually function (Webb). Subsequently, the emerging study has been largely successful in providing correct results and accurate predictions of the behaviors of physical systems to which it has been applied. It transcended the traditional views presented by Newtonian mechanics by exceeding their limitations. Quantum theory became largely accepted by the physics community. It gradually grew into a prominent foundation of several new disciplines including quantum field theory, quantum electrodynamics, quantum statistics and many more (Squires).

### **2.5. Quantum Principles:**

Among the many essential theories and principles that comprise quantum mechanics, the three key concepts, wave/particle duality, quantum superposition and quantum entanglement, introduced in this chapter represent the fundamental principles of quantum mechanics that this study will depend on to correlate between theoretical physics and sociology.

#### **2.5.1. The Wave/Particle Duality:**

Initially proposed by Einstein and later French physicist Louis de Broglie (1892-1987), the Wave/Particle duality is the revolutionary concept that differentiates between classical Newtonian physics and quantum physics. It describes how the fundamental properties of any entity, both light and matter, can simultaneously act both as a wave and a particle under certain circumstances (Wave-particle duality). However, the relationship between the wave-state and the particle-state along with the shift from one state to the

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other remains as one of the most puzzling enigmas in physics with many interpretations trying to explain it. In simple terms, when a particle behaves like a wave that does not mean it is shaped like an actual wave, rather it mathematically functions and has the properties of a wave. This means that the probability of finding its position is mathematically very accurate.

Schrodinger's famous Cat experiment illustrates this phenomenon by imagining placing a cat in a covered cage with a device called a "Geiger counter"<sup>16</sup> and a radioactive substance connected under a suspended hammer followed by a bottle of hydrocyanic acid. The experiment begins as follows: after sometime, the radioactive substance may decay which will release the hammer that will shatter the bottle of acid and consequently release the acid that kills the cat (Wigmore).

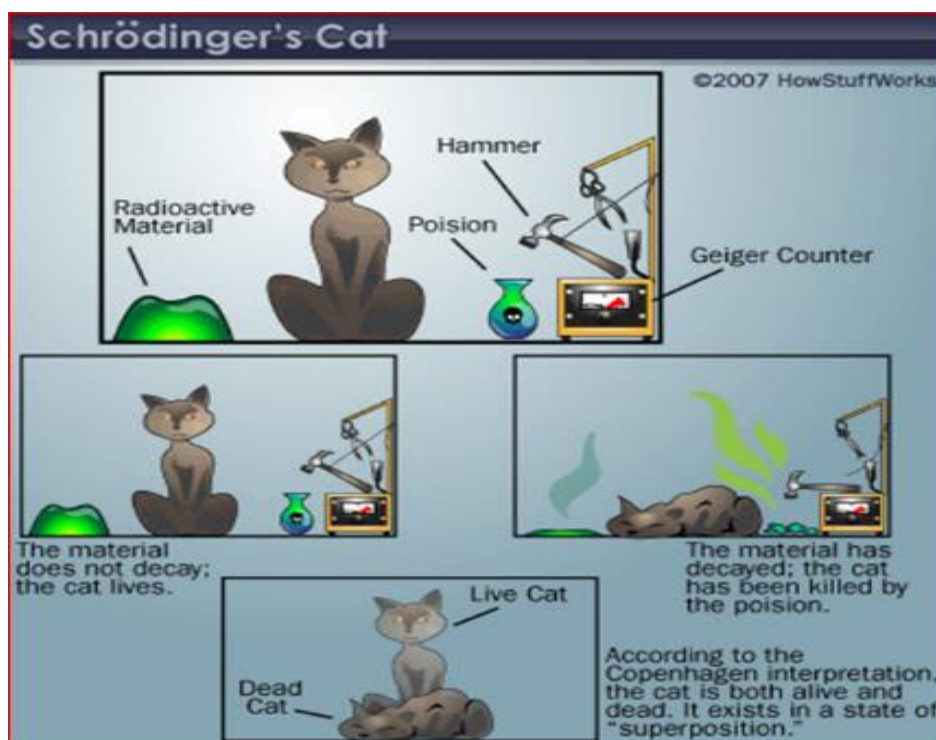


Fig.3.Sandberg, Michael. "Schrodinger's cat experiment". Illustration. 2014. Quantum Computers and Schrödinger's Cat. *Data Visualization Blog*.

<sup>16</sup> A device for measuring radioactivity in substances

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[datavizblog.com/2014/02/25/quantum-computers-and-schrodingers-cat/](http://datavizblog.com/2014/02/25/quantum-computers-and-schrodingers-cat/). Accessed April.2021.

Figure 3 shows that after a while, the cat can be simultaneously alive and dead. The decay of the substance is a random process, there are two possibilities: the substance decays, or not. Either way, the condition of the cat is interpreted as both dead and alive. Yet, when opening the cage, it confirms which probability is correct. Back to the quantum scale, before opening the cage, the cat is in the wave state but as soon as the cage opens it turns into the particle state. In this case, this means that there is a hidden realm where waves exist and the observable world where these waves transform into particles, the barrier between these worlds is measurements and observation. In his "Cat Paradox" Papers (1926), Schrodinger concluded that:

The  $\psi$ -function [wavefunction] of the entire system would express this by having the living and the dead cat (pardon the expression) mixed or smeared out in equal parts. It is typical of these cases that an indeterminacy originally restricted to the atomic domain becomes transformed into macroscopic indeterminacy, which can then be resolved by direct observation. That prevents us from so naively accepting as valid a "blurred model" for representing reality. (Trimmer)

Schrödinger's paradox of the dead/alive cat parallels the way the microscopic world functions. According to the physicist, the only way to distinguish between the "blurred model" of the wave state and the specific measurable position of the particle state is by direct observation. Schrödinger's experiment opens the discussion for the next quantum principle of Superposition, how does it work? And when does reality resolve into one possibility or the other?

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### 2.5.2. Quantum Superposition:

With the discovery of the mysterious phenomenon of the wave/particle duality, comes the theory of Superposition. It is a principle that describes how an entity experiences both states by being in multiple positions at the same time and the way it transports between them. Understanding the change between the particle state and the “invisible” wave state has been a very difficult task for scientists, Italian theoretical physicist Carlo Rovelli (1956- ) expressed this confusing phenomenon saying:

In quantum mechanics no object has a definite position, except when colliding headlong with something else. In order to describe it mid-flight, between one interaction and another, we use an abstract mathematical formula which has no existence in real space, only in abstract mathematical space. But there's worse to come: these interact[ions]...do not occur in a predictable way but largely at random. It is not possible to predict where an electron will reappear, but only to calculate the *probability* that it will pop up here or there. (Rovelli 15)

Before explaining the superposition principle, it is vital to introduce and explain the famous double-slit experiment: First performed by physicist Thomas Young in 1801, the experiment was intended to demonstrate how light may be either waves or particles. However, a hundred years later with the start of modern physics and the theory of the wave/particle duality, Young's experiment evolved to demonstrate how both light and matter can exhibit both wave and particle characteristics (Murray).

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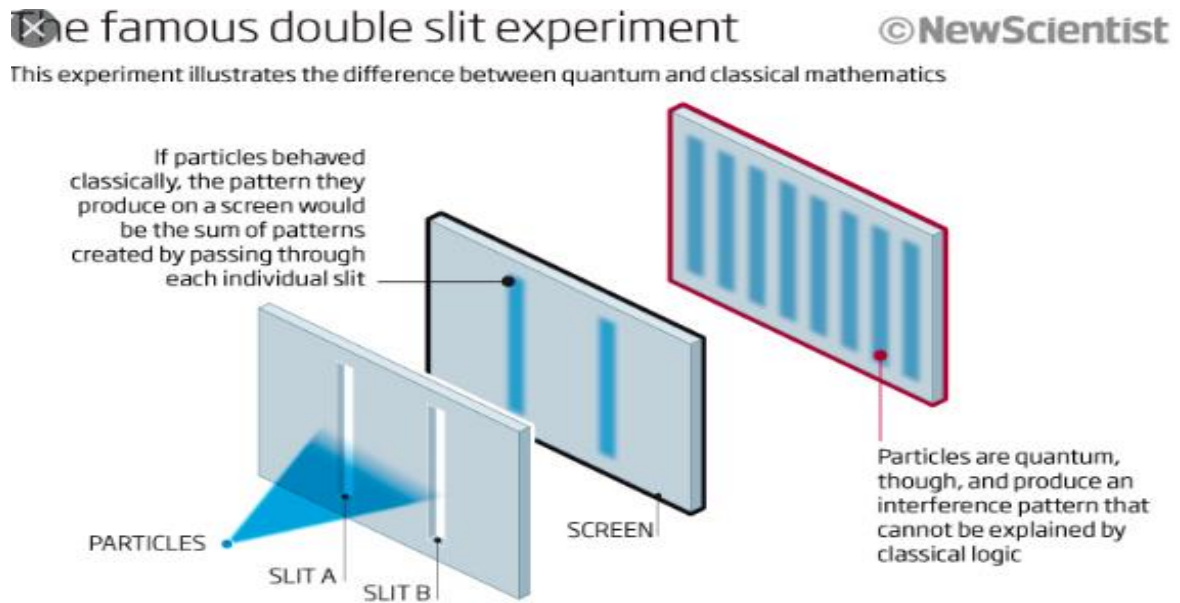


Fig.4. Buchanan, Mark. “The famous double-slit experiment”. Illustration. 2011.

Quantum minds: Why we think like quarks. *NewScientist*.

[www.newscientist.com/article/mg21128285-900-quantum-minds-why-we-think-like-quarks/](http://www.newscientist.com/article/mg21128285-900-quantum-minds-why-we-think-like-quarks/). Accessed April.2021.

As shown in figure 4, the experiment begins with firing a laser beam full of electrons to a plate split into two slits, the electrons pass through the slits into a wall screen. Logically, the fired electrons should form a pattern of the two slits into the wall since they went through them<sup>17</sup>. However, when observing sensors of the last wall, the patterns of the fired electrons form an interference pattern<sup>18</sup> of a wavefunction.

<sup>17</sup>A fundamental concept of classical Newtonian mechanics

<sup>18</sup> Interference pattern: when two or more waves interfere with each other they either show regions of constructive or deconstructive interference.

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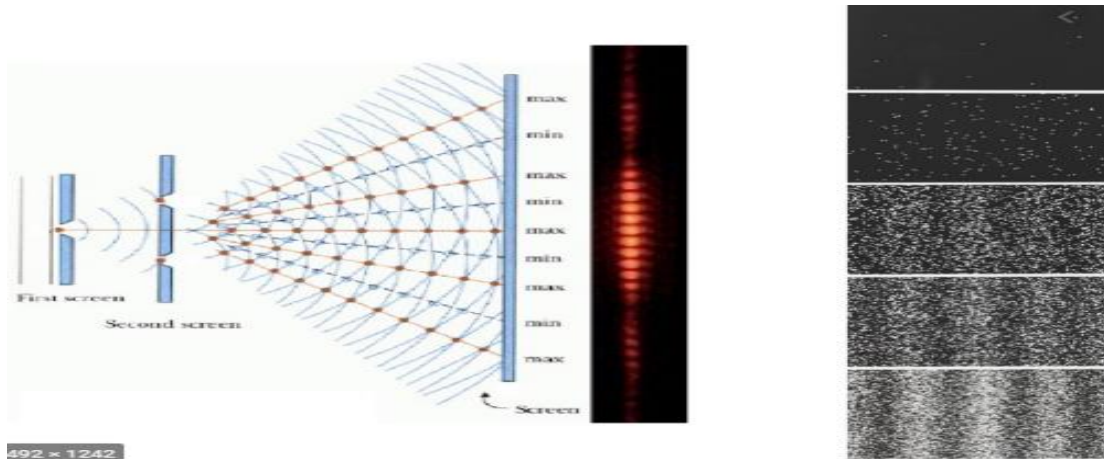


Fig.5. The Physicist. "The interference pattern of particles". Illustration. 2020. *Ask a Mathematician / Ask a Physicist*. [www.askamathematician.com/2020/05/q-what-if-the-particles-in-the-double-slit-experiment-were-conscious-could-you-ask-them-which-slit-they-went-through-afterwards/](http://www.askamathematician.com/2020/05/q-what-if-the-particles-in-the-double-slit-experiment-were-conscious-could-you-ask-them-which-slit-they-went-through-afterwards/). Accessed April.2021.

Figure 5 illustrates how the particles pass through both slits, they essentially transform into waves that spread out and interfere with each other. When interfering, some peaks cancel each other out making the probable final position of the electrons to be unlikely, while other peaks reinforce each other making the probability of the electrons final position to be accurately high.



Fig.6. Gondran, Alexandre. "Simulation of the double-slit experiment". Illustration. 2018. *What Does Quantum Theory Actually Tell Us about Reality?..Scientific American*.

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[blogs.scientificamerican.com/observations/what-does-quantum-theory-actually-tell-us-about-reality/](https://blogs.scientificamerican.com/observations/what-does-quantum-theory-actually-tell-us-about-reality/). Accessed April.2021.

Figure 6 demonstrates the intensity of the electrons' positions. The higher the intensity the brighter the color, it is where the peaks reinforce each other. The impact of the electrons on the screen is demonstrated by Schrödinger's wavefunction where the peaks indicate the highest probability of the electrons. To make it simpler, only one electron can be shot through both slits, this will result in the electron going through the slits simultaneously and form its own wave state. This means that the electron has a superposition of states; it shifts into a wave and can hold two or more positions as it passes through.

To reiterate, the waves describe the probability of the particles' movements and their final positions at a specific place on the screen, but when trying to detect them during the firing, surprisingly, they pass through the two slits and only follow their two patterns creating two stripes on the wall. This demonstrates that the electrons do not form the interference pattern if they are detected; the reason behind this is still a mystery to scientists. Remarkably, it is as if they exhibit their own consciousness of actions. According to quantum theorists, this phenomenon could explain the possibility of quantizing human consciousness on the macroscopic level (Ask a Mathematician / Ask a Physicist).

Subsequently, the quantum superposition theorem is a fundamental principle in quantum mechanics. It explains how particles can share positions and states, meaning instead of either/or it is both/and. This phenomenon is seen as confusing and controversial. However, mathematically it is very accurate. A superposition of states

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determines the movement of particles through atoms and therefore allows for the precise control of their properties on the macro scale. On October 2<sup>nd</sup> 2019, the quantum superposition principle has been tested on the particle scale for the first time in a new study in the University of Vienna in collaboration with the University of Basel. Molecules containing two thousands atoms were made to interfere and form a superposition. By proving that the atoms remained superposed, researchers confirmed the real-life existence of this phenomenon. Yaakov Y. Fein, one of the scientists who made the discovery, concluded that "Our experiments show that quantum mechanics, with all its weirdness, is also amazingly robust, and I'm optimistic that future experiments will test it on an even more massive scale" (Vienna).

### 2.5.3. Quantum Entanglement:

Just like the previous two principles, entanglement in the quantum world is a mysterious phenomenon that baffled many, even the most influential physicist. First, every particle has its own unique identification that consists of four quantum numbers: the principal quantum number<sup>19</sup>, the orbital angular momentum quantum number<sup>20</sup>, the magnetic quantum number<sup>21</sup> and the spin quantum number<sup>22</sup>. These properties define each and every particle and are responsible for its duality and superposition (Quantum Numbers).

When a pair of electrons is generated, interact with each other or share the same space, their properties can become entangled, if one electron has a positive spin, for example, the other will definitely have a negative spin. This connection happens faster

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<sup>19</sup>The principal quantum number: it describes the energy levels of the particle.

<sup>20</sup> The orbital angular momentum quantum number: it describes the subshell of the particle.

<sup>21</sup>The magnetic quantum number: it describes the orbital of the particle.

<sup>22</sup> The spin quantum number: it describes the spin of the particle, positive or negative.

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than the speed of light and is not affected by distance; if one electron is in a laboratory on earth and the second is somewhere billions of light years away, their entanglement would still be intact and when measuring one electron, the information of the other would also be known instantaneously (Quantum entanglement).

This phenomenon was a huge dilemma for physicists including Albert Einstein who strongly believed there is nothing faster than light; he called quantum entanglement a “spooky action at a distance” (Castelvecchi). The entanglement principle, first theorized in 1935 by none other than Einstein himself and colleagues in a paper on the theoretical concept of quantum entanglement, was proven in 1980 by a research team lead by French physicist Alain Aspect (Aspect). This “spooky action” has benefited the world in so many ways. For instance, there is a clock made by the U.S National Institute of Standards and Technology (NIST) in Colorado called the Quantum-Logic Clock, it is so precise that it will never lose or gain a second in some 33 billion years. Another example is Quantum cryptography, it uses entangled photons as keys to decode and secure networks, Switzerland used an identification quantique product for a tamper-proof voting system in their elections where any changes would be immediately apparent. Even in nature quantum entanglement exists, it was discovered that bird species called European Robins exhibit entanglement in their eyes to see earth’s magnetic field and create an avian compass to help them navigate in their migration. These few examples demonstrate how important this phenomenon is and how useful it can be (ScienceABC).

Recently in 2019, for the first time ever, physicists managed to take an actual photo of the elusive phenomenon that still baffles many to this day. The visual evidence proves that quantum entanglement indeed exists in nature and is not just a mathematically proven theory.

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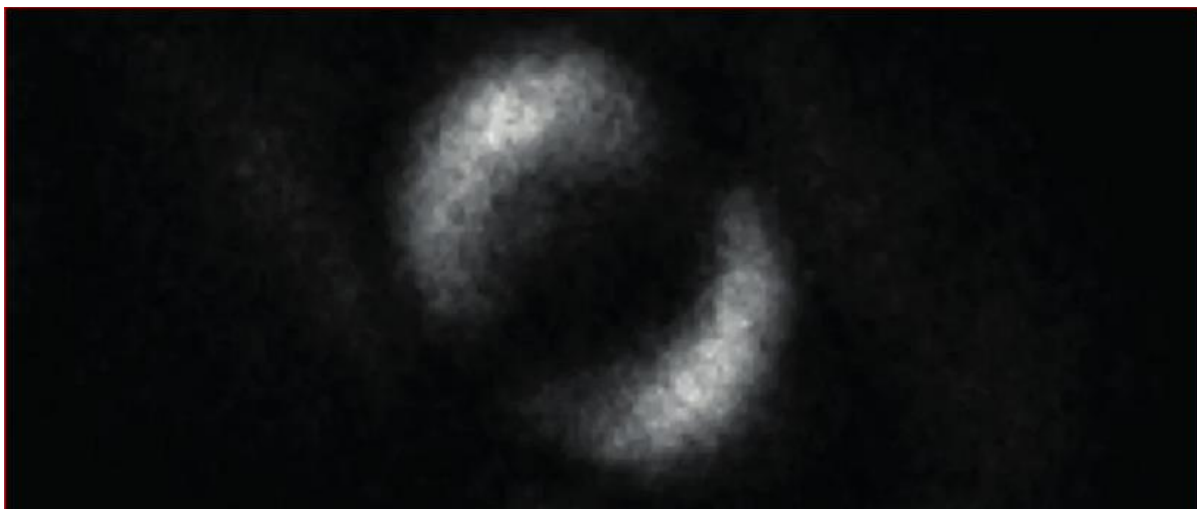


Figure.7. “The First-Ever Photo of Quantum Entanglement”. Photograph. 2019. Scientists Just Unveiled The First-Ever Photo of Quantum Entanglement. *ScienceAlert*. [www.sciencealert.com/scientists-just-unveiled-the-first-ever-photo-of-quantum-entanglement](http://www.sciencealert.com/scientists-just-unveiled-the-first-ever-photo-of-quantum-entanglement). Accessed April.2021.

### 2.6. The Shift from Theoretical Physics to Outside Disciplines:

Although quantum mechanics is a relatively young field in physics, it has been described as the most successful scientific discovery. In addition to revolutionizing physics, it also managed to represent outside domains more adequately than their classic concepts. There is a remarkable diversity in the different approaches and principles of quantum mechanics, this diversity found its way to closer disciplines like Chemistry, Biology, Astronomy and more.

The birth of quantum chemistry dates back to 1926 with the discovery of Schrödinger’s equation and its applications. This branch focuses on the application of quantum mechanics to chemical systems like molecules and the transition states that occur during chemical reactions. Recent development in quantum chemistry enabled the

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interdisciplinary field to reach better accuracies obtained in experiments for molecules, organic systems and complex elements (Quantum Chemistry).

Another discipline influenced by quantum applications is biology. Since all living systems are composed of molecules and fundamentally all molecules are comprised of particles, the main subjects of quantum mechanics, Quantum principles are applied in order to study biological dynamics on increasingly small scales. For example, they are applied on the study of DNA and photosynthesis on a molecular level (Marais).

Astronomy is also highly influenced by quantum methods and theorems. It applies quantum principles on the cosmic level to have a better understanding on the behavior of light as it crosses through space. The field also applies quantum mechanics to describe how stars burn fuel to create light and heat, how the four principal forces of the universe<sup>23</sup> are explained on the subatomic levels, how black holes evaporate and many more large-scale discoveries (Stuart).

### **2.7. The Emergence of Quantum Social Science:**

Studies and researches also showed that the shift of quantum mechanics from theoretical physics to outside disciplines such as philosophy and psychology proved to have profound implications on their developments. New theories and discoveries emerged using quantum forms for neuroscience, psychology and cognitive science. They explain a developing claim that states, from the neuron level, the brain should be studied as a quantum system that operates based on the principles of quantum mechanics (Schwartz, Stapp and Beauregard).

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<sup>23</sup>The gravitational force, the electromagnetic force, the strong nuclear force and the weak nuclear force

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Quantum mechanics was also successfully applied to other wide-ranging fields of social sciences. In a general sense, social sciences are studies of various academic fields that focus on examining all aspects of society. This domain of knowledge includes branches like anthropology, economics, political science, social psychology, history, law and Sociology.

There is no specific consensus on how quantum mechanics spread to social sciences. However, the idea of integrating physics, specifically quantum mechanics, has been discussed by many; a “quantum turn” has been a long time coming (The Quantum Turn in Social Science). Accordingly, one of the earliest published studies that was the reason for the shift of quantum mechanics to social studies was a thesis called “The Quantum Society: Mind, Physics, and a New Social Vision” by authors Danah Zohar and Ian Marshall, they introduced the idea of possibly re-defining social systems using the insights of quantum mechanics. This 1993 study opened the door for physicists and scholars to interpret, in many ways, the spread of quantum mechanics outside its main field of physics, the quantization of social aspects and the emergence of quantum social science. Political scientist Alexander Wendt was very inspired by Zohar and Marshall’s thesis that he wrote a book called *Quantum Mind and Social Science* (2015), since then he has been exploring the topic through various published writings in the field of political science.

### **2.8. Definition of Quantum Social Science:**

Professors Emmanuel Haven and Andrei Khrennikov were also fascinated by the idea of implementing quantum physics into the world of social sciences. In their book

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*Quantum Social Science* (2013) they stated that "quantum social science has as goal to investigate problems within the wide remit of the social sciences – be it economics, finance, psychology, sociology, or other domains of inquiry – with the help of formal models and concepts used in quantum physics. It stems from the psychological idea that human consciousness is quantized and therefore so is human behavior," (Haven and Khrennikov 81). The authors argued that the central purpose of quantum social science is applying quantum principles to try and solve the limitations that social sciences experience. They demonstrated that the way to do so is by declaring that human consciousness is indeed quantized.

This interesting turn from physics and its relatives to a social-scientific area of research has created a link between two different disciplines. This link produces an interdisciplinary field of research that is concerned with modeling social phenomena based on quantum processes. There are two major approaches adopted by quantum social science theorists: some physicists-turned-social theorists and researchers rely on explaining and applying the interesting theory that consciousness is a quantum phenomenon and, therefore, so are human behaviors and interactions. British mathematical physicist Roger Penrose hypothesized this approach in his 1989 book *The Emperor's New Mind* stating that quantum mechanics plays a crucial role in human consciousness. Others, however, apply the approach that focuses on explaining the structures of social-scientific fields using quantum principles as conceptual models without diving deep into quantizing large-scale systems (Haven and Khrennikov 54).

There are many misconceptions concerning the application of quantum methods on real-life events and conceptual paradigms. A frequently asked question is: how can

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concepts of quantum physics become applied to macroscopic and abstract settings? The answer to this question seems to be challenging researchers since this is a young field and is mainly theoretical. However, the idea behind using quantum concepts is to create “quantum-like” assumptions and possible results, not to literally quantize macroscopic entities that are nowhere near Planck’s scale<sup>24</sup>, where quantum mechanics are actually applied. By applying the concepts of quantum mechanics to systems that behave in a similar way to the quantum world, theorists and researchers have found that the predicted outcomes are more accurate and reliable than previous classical approaches.

### **2.9. The Importance of Quantum Social Science:**

Admittedly, quantum social science faced a lot of criticism on its ambiguity and how quantum mechanics is not designed for social systems. However, this new movement proved that social sciences, which are based on classical ideologies, suffer from limitations like determinism and one-dimensional thought processes that tend to be impractical when facing modern global issues. Alexander Wendt and James Der Derian addressed this in their article “Quantizing international relations’: The case for quantum approaches to international theory and security practice” (2020) saying “Practically all of the investigations undertaken in the special issue directly address this issue; and, we believe, they do a good job of demonstrating how networked, complex or emergent aspects of human systems can be quantum in their own right, giving quantum theory a heuristic advantage over classical approaches” (Derian and Wendt). Quantum social science theorists debated these limitations and offered alternative quantum-based theories

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<sup>24</sup> The smallest scale in the universe

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that show better accuracy and are up to date with current social issues. Some of these theories are discussed in psychology, economics and finance, political science and national security.

The previously mentioned studies argued that the use of quantum mechanics outside its main field of theoretical physics and into the domain of social sciences is vital and necessary for the complex systems of society such as psychology, economy and politics. However, almost no attention was paid to the domain of sociology and socio-cultural studies. Hence, a case study is necessary to demonstrate the potentials of quantum social science in socio-cultural settings. This study will focus on both approaches of quantizing consciousness and the application of quantum principles on one the most eventful and socially-packed eras in American history, the sixties American counterculture.

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### **Conclusion:**

This chapter introduced the main sociological theories: Symbolic Interactionism and Conflict Theory. It illustrated their conceptualization of the sixties counterculture through previous academic renderings and mentioned their challenges and limitations. Additionally the study has documented the history of pre-quantum mechanical physics by providing an explanation of the problem of light and the debates between the most prominent physicists of that time. The study also offered definition of quantum mechanics and its main three principles: the wave/particle duality, quantum superposition and quantum entanglement, along with providing illustrations for every principle. Moreover, this chapter tackled the relatively new shift of quantum mechanics to other fields of study like chemistry, biology, astronomy and the quantum turn to social sciences. Finally, this chapter defined and highlighted the importance of quantum social science and its ability to examine social structures with better accuracy than the classical methods, it also drew attention to the lack of exploration on the socio-cultural side which will be analyzed through a case study of the sixties American counterculture.

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### **Introduction:**

The diversity of merging two separate fields of study into an interdisciplinary area of research has introduced various types of findings. Quantum social science is a relatively new domain that offers approaches alternative to the classical social science methods. This chapter will utilize the aforementioned quantum principles in the context of the 1960s American counterculture as a case study. First, it will demonstrate the possibility of quantizing human consciousness and will provide a theoretical framework presented through a simulation of the dynamic era. Consequently, this will enable the analysis to apply the three key principles the wave/particle duality, superposition and quantum entanglement to animate the socio-cultural phenomenon of the counterculture. Next, the analysis will parallel each principle with the diverse structures that comprise the nonlinear system of the counterculture. Finally, the issue of the generation gap will be analyzed with the alternative approaches that exceed the limited notions of the previous classical methods.

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### 3.1. Quantizing Consciousness, the Road to Quantum Behavior:

Consciousness can be defined as an abstract system in which human awareness stems from. It is the archive for human thoughts, memories and emotions. Every individual possesses his own unique consciousness that inevitably dictates his behavior and actions (Cherry). Located in the brain, consciousness is a complex system that operates on the basis of organizing and distributing data.

It is widely conceived that the processes of distribution abide by the laws of classical physics. However, recent studies and researches argue that although the brain, as a whole, is a system that follows classical Newtonian physics, it is still affected by quantum structures that best describe the chaotic nature of brain function, most significantly consciousness. This perception is agreed upon by many neuroscientists and theorists like neurophysiologist John Eccles (1903-1997) who claimed that quantum mechanics is of great importance to the structure and the function of the brain (Beck and Eccles).

Social theorist Alexander Wendt also wrote about the quantization of consciousness and cognition in his book *Quantum Mind and Social Science* (2015) where he argued that the relationship between cognitive science and social science is indeed quantum. Wendt demonstrated that human consciousness is an emerging phenomenon from quantum coherence<sup>25</sup>; thus social behaviors, attitudes and interactions are quantum mechanical. Wendt's experimental theory justifies his interpretation of quantum mechanics and the reality of social science, he argues that the structures of consciousness correspond with the structures of quantum principles and, therefore, affects the cognitive aspects of decision-making, emotions and behavior. Subsequently, the latter has a great connection

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<sup>25</sup> This phenomenon refers to circumstances when large numbers of particles can collectively cooperate in a single quantum state.

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with social phenomena. He stated that "human beings and therefore social life exhibit quantum coherence – in effect, that we are walking wave functions" (Wendt 3).

This quantum turn, as Wendt calls it, opens the door to many possibilities of alternative interdisciplinary studies. It encodes data from the smallest entities in order to discover the structures of larger systems, physical or conceptual. This analysis employs Wendt's epistemology to decode the various socio-cultural structures of the counterculture society.

### **3.2. Simulating the Counterculture Society, a Theoretical Framework:**

Quantizing consciousness alone is not enough to enable the application of quantum principles to conceptual paradigms like the counterculture. It does allow the analysis to theoretically quantize human behavior, yet it does not actualize the relationship between socio-cultural systems such as the 1960s counterculture and quantum principles. That is why many quantum social science theorists and engineers formulated quantum-based simulation models and algorithms that contribute to certain fields of social sciences. Namely, the Monte-Carlo simulation in economics and corporate finance, which is a computational algorithm that operates in a holistic way that captures all possible results and predictions in a quantum-like manner with the purpose of analyzing them in a more sufficient and accurate technique (Haven and Khrennikov 55). More algorithms, like the Monte-Carlo simulation, are being adapted into the realm of social sciences for better problem-solving methods and accuracy.

There are many approaches chosen by quantum theorists for their studies, as said by theorist Michael Murphy "Some commentators quantize their work by building on the theoretical framework developed by an earlier quantum social theorist; others return to

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the sources of quantum physics. Either approach... facilitates the encounter with quantum thinking, to engage in and contribute to the broader project of quantum social theory” (Murphy 40). This study is, in a general sense, fundamentally theoretical and is adopted for the purpose of synthesizing quantum social science with the 1960s counterculture in a conceptual manner. However, it does follow the scheme of the previous studies that adapt such algorithms for more accurate results. This research also combines both of the previously mentioned approaches of quantum social science: Quantizing consciousness and applying quantum principles.

As previously mentioned in the second chapter, the quantum behavior of particles and their relationships with each other create chaotic systems that attest to the composition and the behavior of larger structures. This attestation transcended the traditional views presented by Newtonian mechanics in terms of assimilating the complexity of such systems. In a similar way, the dynamic socio-cultural structure of the 1960s counterculture emerged based on many contributing factors in a manner that parallels how quantum systems operate. These factors, consisting of individuals and movements of the counterculture generation, act as participating particles that theoretically abide the laws of quantum principles such as wave/particle duality, superposition and entanglement. Simulating the sixties counterculture society, as a unit, and its individuals, as participants, into quantum terms allows the analysis to categorize all socio-cultural aspects of the era in a holistic yet more accurate way. This frame of analysis will illustrate how counterculture structures affect each other and the American society under the control of quantum models.

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### **3.3. The Application of Quantum Principles on the Sixties**

#### **Counterculture:**

The idea in question is the assimilation of quantum principles from quantum mechanics to outside settings that are not only conceptual, but operate on a macroscopic level way beyond Planck's scale where quantum mechanics is in full effect. Albeit, this study is not indicating that quantum mechanics is mathematically operational on the larger scale, at least not yet, and that the study of Newtonian physics does not offer sufficient groundwork on the macroscopic level. However, with many recent studies indicating the quantization of consciousness and the ability to theoretically simulate social structures in a quantum manner, in this case the sixties counterculture, the idea of applying quantum models to human behavior and conceptual settings does not seem unimaginable or inapplicable, thus a theoretical application is possible.

Before commencing the application, it is crucial to understand that the three principles complement each other in a simultaneous way, meaning that they do not operate separately, rather in an instantaneous manner. The following categorizations are for the purpose of clarifying the analysis and facilitating the complex structures of the studied quantum principles.

#### **3.3.1. The Wave /Particle Duality of the Sixties Counterculture:**

##### **3.3.1.a. The Wave State, the Fight for a Bigger Cause:**

Essentially, the wave state is indeed a model of behavior that is pattern-oriented. It is a collective notion that calculates the probable movements and behaviors of particles. Although this notion is an unobserved phenomenon that seems to be chaotic in the way it functions, as explained in chapter two, it still has an undeniable effect on the movements

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and positions of particles. Similarly, the wave state corresponds to how the American counterculture rose as a dynamic socio-cultural system consisting of social movements, structures and shared practices. Murphy illustrated this link in his book *Quantum Social Theory for Critical International Relations Theorists* (2020):

Social structures, institutions, and practices are invisible, but their effects are real, just as the wave nature of light is directly invisible but nevertheless produces clearly *real* effects based on visible patterns. When individuals interact with social entities, or when social scientists study them, all we see are the constituent actants, effects, and end states, just as an observing physicist sees a shower of discrete particles or a pattern indicating particular wave behaviours. (Murphy 85)

As the quote entails and in reference to the case study, although the movements of the counterculture are not exactly physical, they still produced actual effects on the American society as a whole. The rise of the sixties counterculture did not only consist of the “sex, drugs, and rock and roll” description (Bach 13), even though some did see it that way, many others however, believed that it was a greater fight for a bigger cause. Like the quantum interference of the wave state, the counterculture was not a single movement, rather an interference of many structures, ideologies and movements that collectively merged for the main purpose of revolutionizing previous socio-cultural views and changing the status quo.

Schrodinger’s argument on the wave state describing it as a “kind of blurring of *all* variables in *one* perfectly *clear* concept” (Barad 276) applies to the complex and dynamic era that cultivated the idea of social change. This is evident in the emergence of the many movements that were initiated by the alienated youth who sought to reform their society’s conventions in their own terms. Among the emerging movements and organizations were the Civil Rights Movement, the NOW organization and the new political culture represented by the new left, advocates of the latter included groups of young activists,

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most of whom were university students of the SDS. They rejected what they believed was an indoctrination by the establishment and began to openly criticize the government's bureaucracy by initiating protests, marches and the Free Speech Movement. The SDS and other youth organizations in support of the new left across the country were also advocates for other movements demanding for social justice for all American citizens.

In addition, they spoke against the war in Vietnam. Raymond Mungo, a co-founder of the radical underground newspaper Liberation News Service (LNS) (1967-1981), wrote "From Vietnam, I learned to despise my countrymen, my government, and the entire English-speaking world, with its history of genocide and international conquest" (Bach 77). This criticism of the American government's actions was a shared opinion among many young Americans, the alienated youth sought for a new culture that opposed the one they were living in. "Things are bad all over... and the only hope is people getting together with other people for the good of all the people" commented poet John Sinclair (1941- ) (Bach 84), he emphasized on the idea of unification for the purpose of achieving a new more reformed society. In a way, these movements were intermingled with each other for the same purpose of social change.

Using Schrödinger's argument, this interference with the counterculture movements as well speaking against the Vietnam War created a concept of shared beliefs that blurred together for the holistic outcome that is social change. These interactions of movements are symbolized by the interferences of multiple quantum waves that are embodied by the collective minds of certain groups of young activists who, even though had different functions, organizations and movements, they still advocated for the same final concept, a social change.

From a retrospective standpoint, some movements and organizations, to some degree, were able to achieve social change, while other organizations did not achieve such

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success. In quantum terms, this is explained by the types of interferences the quantum waves exhibit. As previously mentioned, there are two types of interferences: reinforcing and cancelling, the reinforcing interferences create a stronger probability of success, as an example, the Civil Rights Movement. Other waves, however, experience cancelling interferences where the probability of success is weakened, for example, the split of the SDS and its eventual end during the 1970s.

The following figure explains the wave state of the counterculture movements:

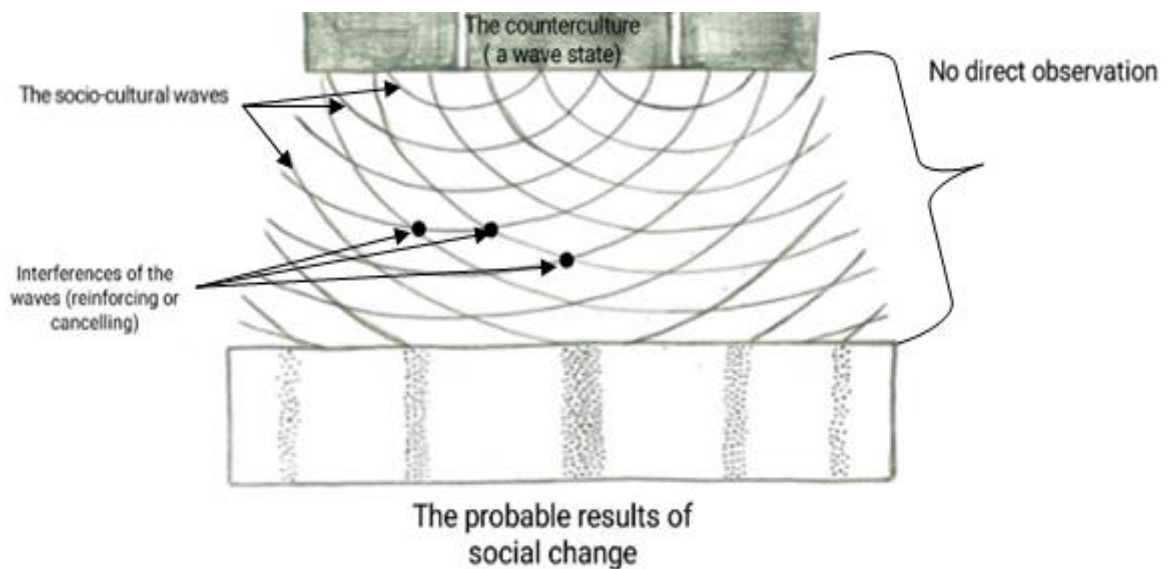


Fig.8.Nebeg, Leila. "The Wave State of the 1960s Counterculture". Illustration. 2021.

Figure 8 illustrates how the counterculture operates in a wave state, where the waves of the movements, with no direct observation, are blurred together and interfere with each other for the final state of achieving, or failing to achieve, social change.

### 3.3.1.b. The Particle State of Seeking Individual Freedom:

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Unlike the wave state, the particle state can indeed be an observable phenomenon since a particle is a precise, tangible entity. Measuring the data of a particle is a highly precise process seeing that the information is obtained in direct and straightforward manners that rely on observation and measurement (Murphy 24). In a similar fashion, this microscopic interpretation parallels the macroscopic concept of seeing the counterculture as an observable phenomenon through individual freedom, where the latter can be observed in the words, actions, attitudes and lifestyles of those who chose to alienate themselves from what they described as authoritative society and seek personal liberation. Here, the analysis focuses on the considerable number of young people who sought individual freedom throughout the sixties counterculture.

To many, the ideology of counterculture signified a reflection of individual freedom obtained in various shapes and forms such as self-indulgence, personal recognition and creativity, sexual freedom, Psychedelia and complete hedonism. The opposing youth who chose to live a more modest life of escapism were publically referred to as hippies, freaks, longhairs and flower children. They chose to simply live in the moment without having to worry about responsibilities and social obligations.

Expressing a total disregard to Authoritarianism<sup>26</sup> was a popular attitude during the 1960s, especially among the hippies who disregarded what they called capitalist propaganda and straight society. Although they did not have a leader and despised authority, many of the alienated youth followed the philosophies and practices of American psychologist and writer Timothy Leary (1920-1996). He took interest in exploring the effects of psychedelics on the human mind when he was lecturing in Harvard University in 1960. After being fired in 1962 for promoting the recreational use

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<sup>26</sup>The enforcement of strict authority at the expense of personal freedom

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of hallucinogenic drugs, the psychologist-turned-counterculture icon soon became popular for speaking against the American government and promoting personal liberation through psychedelic mysticism (Hall).

Leary and his followers believed that the road to spiritual enlightenment and individual discovery can only be achieved by forging your own path of disregarding the capitalist material world and focusing on thinking for yourself as well as indulging in the ultimate subjective experience. Many of Leary's words became popular catchphrases that represented the hippies' counterculture, phrases like "turn on, tune in, drop out" and "think for yourself and question authority" were slogans for those who saw the dynamic era as a time to live in the moment and indulge in hedonistic pleasures (Joseph).

A key factor that popularized the idea of individual freedom among the youth was the psychedelic experience. From Ken Kesey's house parties to Rock festivals filled with hundreds of thousands of people, psychedelics such as LSD, Marijuana, Ayahuasca, Psilocybin Mushrooms and many other drugs were the symbol of the decade creating a generation of people who preferred spirituality over materialism, hedonism over responsibility and individualism over mainstream. In a 1967 BBC interview, Leary spoke about the influence of psychedelics in the American society saying "Our Supreme Court will be smoking marijuana within fifteen years. It's inevitable, because the students in our best universities are doing it now. There'll be less interest in warfare, in power politics. You know, politics today is a disease-it's a real addiction" (Roszack 168). Admittedly, the psychedelic movement created a nation-wide reaction against the American establishment and advocated for the rise of personal consciousness through individual freedom in style, art, philosophy, sexual mores, spiritual thinking and simply being (Lumen Learning).

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Leary's philosophies spoke truth to many; his blunt, nonchalant personality made him a popular counterculture figure. However, it also made him a target for the American government. The man who President Richard Nixon once described as "the most dangerous man in America" was jailed countless times, yet this did not stop him from speaking out. "Tune in, Turn On, Drop Out" "*Drop Out* – detach yourself from the external social drama which is as dehydrated and ersatz as TV. *Turn On* – find a sacrament which returns you to the temple of God, your own body. Go out of your mind. Get high. *Tune In* – be reborn. Drop back in to express it. Start a new sequence of behavior that reflects your vision" (Lander).

Many gatherings and events were organized by the alienated hippies where they would escape and disconnect themselves from society. They engaged in acts of self empowerment, physical pleasures and spiritual practices that were heavily induced by psychedelics. The 1967 Chicago Be-In event, for example, held approximately around thirty thousand alienated hippies, among the attendees was Timothy Leary who said "Don't vote. Don't politic. Don't petition ... You can't do anything about America politically" (Bach 136). Events like this were very popular during the sixties; they dispersed across the country to promote limitless individual freedom, criticism of their current society and a radical social change.

The link between the particle state and, in this case, hippies advocating for individual freedom can be interpreted in the following manner: Like the microscopic level, the analysis here focuses on the precise action of individual freedom over the blurred function of the socio-cultural movements. In quantum terms, the counterculture is observed in a direct manner through the analysis of known figure of individual freedom Timothy Leary. Individual freedom, although shared by many, can be interpreted as the

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particle state where it embodied the counterculture through Leary himself, a single, measurable particle. Admittedly, this analysis can directly observe any documented hippy who advocated for individual freedom during the sixties. Choosing Leary is because of his popularity and influence which resonated with many of the alienated youth. The precision here relies heavily on the documented personal experiences and spoken words. To better illustrate, the following figure explains the particle state of the counterculture:

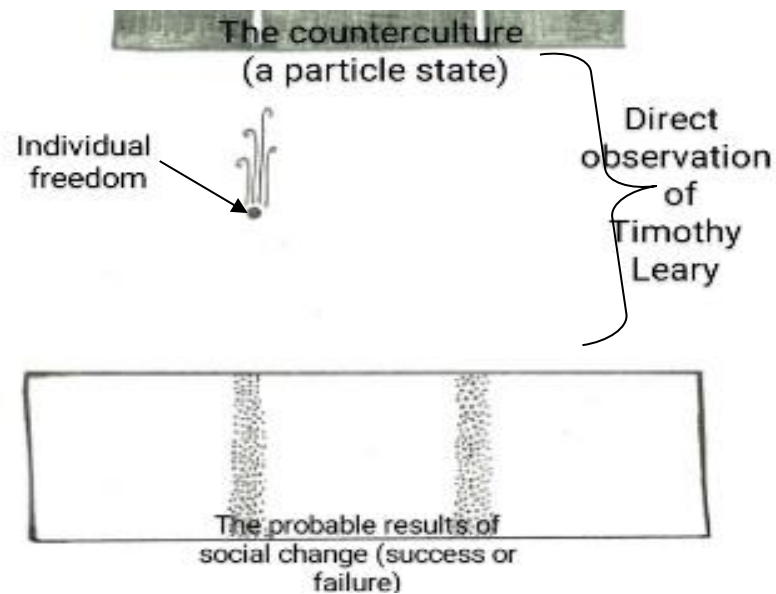


Fig.9.Nebeg, Leila. “The Particle State of the 1960s Counterculture”. Illustration. 2021.

Figure 9 illustrates how the counterculture operates in a particle state. With direct observation represented by the description of Leary, his popular words and philosophies, individual freedom is conceptualized and summarized in the simulated particle that is Leary himself. The final state of social change is represented in the figure as two probabilities: either Leary succeeds or fails to bring social change. In this case and from a retrospective stance; Leary failed.

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### **3.3.2. Superposition of both States of the Counterculture:**

In quantum mechanics, a superposition of states implies how an object can have more than one position. The superposition principle describes how an electron, for example, can exhibit both the wave state and the particle state simultaneously. This phenomenon is very much random and unpredictable which is why quantum scientists mainly focus on probability over certainty in order to not limit the complexity of existent entities to the restricted calculation of classical Newtonian physics (Murphy 24).

In light of the previous analyses, a superposition of the social movements and individual freedom can be interpreted as follows: Like Young's double slit experiment; the wave state of the counterculture creates patterns that cannot be directly detected, yet they can still be modeled as wave functions with interferences. However when there is a direct observation, the waves collapse and a particle state appears, in this case Timothy Leary's individual freedom. The quantum superposition principle explains how both states can be shared simultaneously just like the case of Schrödinger's dead/alive cat. However, the randomness of the change of states is not so much random, rather a choice determined by the quantum consciousness of complex human beings, their decisions and their social behaviors.

#### **3.3.2.a. Leary, the weatherman and the black panthers:**

The superposition of both states can be interpreted in Timothy Leary himself. In 1968, Leary was arrested for marijuana possession and faced a ten year sentence. However, he escaped with the help of the Weatherman organization, originally known as the SDS. The evolved organization took a more radical and revolutionary path through violent acts against the U.S government (Lambert). The LSD promoter was also an

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advocate for the Weatherman organization and their radical ways. Weatherman leader Bernardine Dohrn (1942- ) wrote to the media claiming she had “the honor and pleasure of helping Leary escape” after helping Leary escape to Algeria where he was granted asylum. Leary wrote in a letter “I offer living gratitude to my sisters and brothers in the Weatherman underground who designed and executed my liberation” (Timothy Leary Gets Asylum in Algeria).

Leary was not only an advocate for the radical activists. The psychedelict counterculture icon was also joined with Eldridge Cleaver, the leader of the political black power organization the Black Panthers. Leary and Cleaver both had ties with each other, the political fugitives were both granted asylum by Algerian President Houari Boumediene (1932-1978) for the Panther’s revolutionary international actions including in Algeria. (Timothy Leary Gets Asylum in Algeria)



Fig.10. “Algerian President Houari Boumediene greeting both Cleaver and Leary in 1970”. Photograph. N.D. *Flickr*. [/www.flickr.com/photos/50384165@N06/6725408425](http://www.flickr.com/photos/50384165@N06/6725408425).

Accessed April.2021.

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### **3.3.2.b. Activists and Individualists: How Hippies Turned to Politics and Activists Engaged in Self-Indulgence:**

Another action of superposition is apparent in the social behaviors of many activists who, at the same time, shared the superposition of fighting for social change and seeking individual freedom. In a simultaneous manner, many hippies began to engage in social movements such as the Anti-War Movement, the Civil Rights Movement, The Feminist Movement and other social waves. In his PhD research paper on the sixties counterculture, Professor Bach touched on this saying:

Defining the counterculture in the late 1960s presents a complex and formidable task. Most scholars argue that the New Left and counterculture represented distinct phenomena. Others contest this interpretation, arguing against this perspective in its entirety or minimizing the differences between the two camps...it is difficult to discern where the New Left and counterculture overlapped or converged or diverged... A partial blending of the New Left and counterculture did indeed occur. More and more hippies showed up at anti-war demonstrations and many New Leftists engaged in countercultural behavior. (Bach 179)

As stated by Bach, some historians distinctly separated the counterculture from the social movements of the New Left activists. While others argued that the counterculture was a combination of both phenomena where many radicals and activists expressed the individualistic philosophies and lifestyles of the hippies, and more hippies demonstrated their voices at social movements and protests. However, this quote entails that, although they share similarities, the New Left political culture and the counterculture are not the same. Using Newtonian logic, Bach here claims that the entirety of the counterculture is the individualistic lifestyle of the hippies.

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This analysis argues that the New Left is as much part of the counterculture as the hippies, and that a superposition between the two states does exist. However, just like the quantum superposition is a random process in the microscopic world, a superposition between the two macroscopic states is also random, but the randomness here is expressed by the quantum consciousness of each participating individual, thus their actions and social behaviors. An example of this principle is when members of the SDS and black revolutionaries took control of Columbia University in April, 1968 where they took psychedelics, engaged in sexual acts, participated in hedonistic pleasures and embraced self-indulgence (Bach 181).

### **3.3.3. Entanglement of the Collective Minds of Popular Groups during the Counterculture:**

Alexander Wendt was among the first theorists to discuss the possibility of integrating quantum entanglement as an agent of ontological property; he argues that:

...only individuals and their practices are really real. As such, in a classical sense, states are nothing but individuals and their interactions; there is no higher reality of the state existing above them. However, unlike classical agents, quantum ones are endowed with superposed minds entangled through language, which means that they enfold socially shared wave functions within their subjectivities, one of which concerns the state. So the members of states are not fully separable from its wave function either, but constituted in irreducibly relational terms by their co-participation in this discursive form. (Wendt 269)

Wendt suggests that entangled collective minds indeed create social structures. Entangled individuals that also experience superposition are what constitute a state or a society; therefore, they are what constitute its wave function. Here, entanglement is a fundamental component to the function of the previously mentioned principles and accordingly the existence of social systems. There is no separation between individuals

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entangled through various factors and the wave function that represents the social system in which they exist. These entanglements build a chaotic yet functional system.

Relating this description to the counterculture society, the entanglement principle exists in various aspects of the dynamic era. Many entangled collective minds during the sixties created the wave function of the counterculture through different types of factors. This analysis focuses on the main entangled groups that influenced the rise of the counterculture and were influenced by it.

### **3.3.3.a. Entanglement through Language and Popular culture:**

Collective consciousness was a popular notion during the era of the sixties; individuals were grouped together by sets of shared beliefs and practices creating waves of socio-cultural structures that shaped what was defined as counterculture. In quantum terminology, these groups of collective minds were entangled with each other through distinctive properties that created such connection. Among these properties is language, the 1960s language was a dominating factor that created an entanglement among the rebelling youth. Many new emerging words and phrases were relative to the alienated individuals and their socio-cultural situations. The decade was symbolized by its own cultural slang language that was used to express the voices of many who shared their social unrest towards a government they were skeptic of, values and traditions they opposed and a culture they wanted to change. Phrases like “Groovy”<sup>27</sup>, “Can you dig it?”<sup>28</sup> “Slug Bug”<sup>29</sup>, “Chill out”<sup>30</sup> were token linguistic features of the decade that were used by waves of people who were entangled with each other through them.

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<sup>27</sup> As in “cool” (Steffen)

<sup>28</sup> Which means “do you understand?”

<sup>29</sup> referring to a Volkswagen Beetle

<sup>30</sup> As in “relax”

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Language alone was not the only connecting factor; music, psychedelics, festivals and fashion were also contributing properties of the entanglement. Rock and Roll was more than just music to the alienated youth, it was seen as a revolutionary lifestyle that “possessed the power to liberate the body and soul and promoted a sense of community” (Bach 45). This link was described by American social activist Jerry Rubin in his book “Do It!” where he said “Elvis Presley ripped off Ike Eisenhower by turning our uptight young awakening bodies around. Hard animal rock energy beat/surged hot through us, the driving rhythm arousing repressed passions. Music to free the spirit. Music to bring us together.” (Hamm 81). Music did indeed bring them together; it transcended its meaning of entertainment and became a symbol of an alternative revolution of free expression. The “Peace and Love” generation was a wave of collective minds that shared the ideology of alternative lifestyle where factors like LSD, Acid Rock, peculiar clothing and raving festivals were not only common but essential to their revolution.

### **3.3.3.b. Entanglement of Race:**

Another popular interpretation of quantum entanglement in the 1960s counterculture is exhibited by the collective minds of black Americans. The sixties decade saw an unprecedented emergence of black American voices demanding for equality. These individuals shared an entanglement of social unrest through factors like experiencing racism and segregation, police brutality and systemic racism, denial from equal rights and violence. These factors led Hundreds of thousands of black people to initiate their own wave of demonstrations during the counterculture decade; the Civil Rights Movement was a unification of the entangled collective groups.

Led by Martin Luther King Jr., the CRM initially took a non-violent path of peaceful demonstrations, boycotts, sit-ins and marches that shaped the shared beliefs and

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demands of the black community. However, the increasing brutal assaults on black people by police force and racist white mobs led to a radicalization of the collective minds of black people. The constant aggression was a factor in the entanglement that led to their aggravation. Malcolm X became a powerful figure of the movement with his radical solutions to fight back instead of asking for peace. This shared sensation grew with the assassination of the movement's leading figures X and King; African-Americans joined the Black Panthers Party to fight for liberation. Civil rights and equality were what the black community fought for, this entanglement led to the creation of the social and political wave that is the CRM. By the end of the decade and despite the racial oppression towards Black-Americans, the movement did achieve some of its major demands such as abolishing segregation and affectively implementing the 15<sup>th</sup> Amendment which states the right to vote for black Americans. Nevertheless, social unrest was still ongoing which, in turns, made the collective minds of black people more entangled.

### **3.3.3.c. Entanglement of Gender:**

Like the previous two interpretation of the entanglement principle, feminism was also a popular movement created by groups of entangled individuals demanding gender equality. A study conducted by American feminist theorist Professor Karen Barad (1956-) where she combined theoretical physics with feminist studies. In her multi-disciplinary book *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (2007), Barad constructed a framework that intertwines quantum entanglement, as an alternative notion, with feminist studies. "Our (intra)actions matter [because] each one reconfigures the world in its becoming" (Barad 349), her conceptualization of social phenomena, such as the feminist movement, is generated by 'ontological entanglements' of individuals; hence they are of great importance.

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Correspondingly, the feminist movement of the 1960s counterculture seems to follow Barad's epistemology. Many American women exhibited an entanglement embodied in the criticism and rejection of the traditional views assigned to them. The concept of the stay-at-home mother seemed to nullify their individuality and restrict them to what they saw as a patriarchal society dominated by male authority. These shared properties of entanglement were depicted in Betty Friedan's *The Feminine Mystique* (1963), it popularized the feminist ideology and initiated a wave of collective consciousness that was incorporated by the NOW movement. These groups of feminist women shared a feeling of frustration and neglect; one Friedan stated that she felt "... desperate. I begin to feel I have no personality. I'm a server of food and a putter-on of pants and a bedmaker, somebody who can be called on when you want something. But who am I?" (A New Women's Movement). This limitation and feeling of deprivation created an entanglement between thousands of women who wanted to have more opportunities and freedom in work spaces, personal lives, relationships, body image, style and clothing, sexual interests along with birth control and abortion (Napikoski). These factors served as properties by which the collective minds of feminists shared and, accordingly, formed the wave of feminism.

It is important to mention that the counterculture consisted of many other socio-cultural waves that contributed to its existence. To name a few, the Marxist Movements, the Gay Liberation Movement, the Mexican America Activism and the Environmental Movement. These movements can also be assimilated and analyzed by the quantum principles since they parallel their structures, therefore, an application is indeed possible. It is also important to reiterate that the notions of wave/particle duality, superposition and entanglement exceed the interpretation of the socio-cultural system of the counterculture due to their dynamic and stochastic<sup>31</sup> nature. This idea is stated by author and

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<sup>31</sup> A stochastic process or system is concerned with random probability.

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neuroscientist Joe Dispenza in his book *Breaking The Habit of Being Yourself: How to Lose Your Mind and Create a New One* (2013):

Like everything else in the universe, we are, in a sense, connected to a sea of information in a dimension beyond physical space and time [the quantum world]. We don't need to be touching or even in close proximity to any physical elements in the quantum field<sup>32</sup> to affect or be affected by them. The physical body is organized patterns of energy and information, which is unified with everything in the quantum field. (Dispenza 16)

### 3.4. Quantum Interpretation of the Issue of the Generation Gap:

After its first release in the United States, English band The Who's "My Generation" (1965) conveyed a powerful message to the youth of the counterculture. The English rock band's lyrics described the growing generation gap between the counterculture generation and their conservative parents:

People try to put us d-down (Talkin' 'bout my generation)  
Just because we get around (Talkin' 'bout my generation)  
Things they do look awful c-c-cold (Talkin' 'bout my generation)  
I hope I die before I get old (Talkin' 'bout my generation)

This is my generation  
This is my generation, baby

Why don't you all f-fade away (Talkin' 'bout my generation)  
And don't try dig what we all s-s-say (Talkin' 'bout my generation)  
I'm not trying to cause a big s-s-sensation (Talkin' 'bout my generation)  
I'm just talkin' 'bout my g-g-generation (Talkin' 'bout my generation).  
(Townshend)

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<sup>32</sup>In space, the quantum field is the framework that contains all existing particles that make up the universe.

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The song symbolized the start of the younger generation's revolution and their detachment from their parent generation. The lyrics clearly express an evident generation gap that was a current issue during the decade of the counterculture. Indeed, both generations exhibited a sense of indifference from each other. The older generation shared traditional views of patriotism and conformity, while the younger generation believed in breaking free from these conventions and opposing the mainstream.

The conservative adults did not understand the reasons behind a rebellion; they condemned the counterculturalists' careless actions and ungratefulness believing they had no reason to rebel, especially since they were the first generation to live in relatively peaceful upbringings with no world wars or economic clashes. Mrs. Slocum, an old conservative lady, expressed her views on the rebelling youth saying "They're those hippies... Lordy, I never knew there were so many of them. See those girls in long hair and bare feet? They say they never wash. We'd best go someplace else now. I wouldn't be surprised if they—well, they say they have orgies, don't you know" (Bach 15). Translating this into quantum terms, her concerns illustrate how there are no contributing properties between Mrs. Slocum and the rebels for an entanglement to be created. The conservative lady is part of the mainstream generation wave; a superposition between her and the younger rebels does not seem to exist due to the absence of the entanglement. This is the reason miscommunications and a generation gap existed during that period of time.

The same thing goes for the alienated youth; during a radio interview The Who's guitarist John Entwistle (1944-2002) stated that "'My Generation' was inspired by the fact that I felt as artists we had to draw a line between all those people who had been involved in the second world war and all those people who were born right at the end of

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the war,” adding “Those people had sacrificed so much for us, but they weren’t able to give us anything. No guidance, no inspiration. Nothing really. We weren’t allowed to join the army, we weren’t allowed to speak, we were expected to shut up and enjoy the peace... And we decided not to do that” (Taysom). The guitarist argued that his generation grew more and more alienated from his parent generation, the lack of common grounds drove them to alienation and experiencing a sense of not belonging. He stated that there were no communications, only authoritative instructions to conform. The youth saw conventions as restrictions, one hippie stated that “You can’t do anything that’s spontaneous or from yourself. You make love like in the toothpaste ad, talk to your children like . . . ‘Father Knows Best.’ . . . they’ve lost the natural ecstasy of living, man” (Bach 31).

Their rejection to authority and patriarchal society led them to form their own lifestyles of opposition. Phrasing this in quantum terminology, the counterculture generation rejected the beliefs and practices of the conservative generation; there was no entanglement that could have created a wave of agreement and cooperation. Therefore, the wave state of the rebelling youth did not interfere with the wave state of the parent generation due to the lack of contributing factors of entanglement.

### **Conclusion:**

This chapter applied the interdisciplinary study of quantum social science to the case study of the American counterculture of the 1960s. Firstly, after explaining the

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possibility of conceptualizing human consciousness, the study provided a theoretical framework based on simulating the socio-cultural system of the sixties counterculture. This parallelism allowed the study to analyze and interpret the main structures of the sixties' society through a quantum application of the wave/particle duality, superposition and entanglement, as alternative sociological approaches. Finally, the analysis tackled the issue of the generation gap of the conservative older generation and the rebelling younger generation during the counterculture. It conceptually analyzed and described the issue from a quantum perspective.

## **General Conclusion:**

Substantially, this dissertation introduced and attempted to apply the relatively new interdisciplinary field of quantum social science on the socio-cultural phenomenon of the 1960s counterculture. The main aims of the research were, first, to attempt assimilating the quantum principles: the wave/particle duality, superposition and entanglement, as alternative methods for the sociological study of the counterculture. Next, to structure an analytical quantum approach that offers holistic interpretations which parallel the unpredictability of sociological paradigms and human behavior in social constructs. The last aim is to further expand the study of quantum social science to the domain of sociology and socio-cultural studies.

The study strived to answer the research questions through constructing a theoretical analysis that detailed the most influential aspects of the counterculture. Questions like the extent of quantum social science's ability to explain the sixties era with better accuracy were answered by providing interpretations of the socio-cultural phenomenon in a quantum manner. The analysis illustrated the function of the counterculture in a holistic and detailed way that transcended the classical sociological methods and approaches. Moreover, the application of the fundamental principles allowed the research to analyze the case study in a nonlinear and heuristic manner.

The question of whether the counterculture generation was drawn to self actualization or a collective fight for a bigger cause was answered by applying the Wave/Particle duality and the Superposition principle. Accompanied by illustrations, the two principles demonstrated that the counterculture consisted of both states in a simultaneous manner: a wave state that described the social movements, and a particle state that described individual freedom. The quantum superposition illustrated how both states can simultaneously shift from one state to another, where the randomness of the

change is a choice determined by the quantum consciousness of complex human beings, their decisions and their social behaviors.

Furthermore, the study also managed to answer the question concerning language, race and gender by integrating quantum entanglement as an agent of unification between the collective quantum minds of different social groups of that time period. The analysis illustrated that many entangled collective minds during the sixties shared different types of factors such as language, gender and race that served as properties of the entanglement which attributed to the formation of various social waves and subsequently formed the wavefunction of the sixties counterculture.

The study also tackled the issue of the generation gap between the rebellious youth and the conservative adults by assimilating the causes of the conflict to a lack of contributing factors that create an entanglement which in turn initiates a wave/particle duality accompanied by a superposition that relies of quantum consciousness of individuals.

Lastly, this dissertation strived to further the possibility of exploring probable solutions of social reformation and communication, in the case of the counterculture and other, more current, socio-cultural paradigms. Due to the flexibility of the quantum-like modeling of the counterculture, the application of quantum principles can possibly exceed the interpretation of the sixties decade and perhaps even ameliorate other, more current sociological systems facing societies.

The arguments against quantum social science seem to target the validity and relativity of the rising field. Questions like “why do we need to apply physics to social sciences?” are frequently asked. Albeit, the idea of merging two completely different fields of study seems bizarre, however, quantum social science demonstrates a lot of

problem-solving methods. Through various studies, it proved to offer better alternative solutions that transcend the classical approaches that were used. The quantum-like process does not suffer from the restrictions and the limitations classical theories tend to suffer from. On the contrary, it offers more possibilities and probabilities that expand the area of research. That is why; this research illustrates the importance of applying quantum social science on socio-cultural studies. By applying quantum principles to the sixties counterculture, the study attempted to construct a process that could surpass the barriers of the either/or approaches and was able to hopefully re-define the complex system of the counterculture from a quantum-like perspective.

As a recommendation for further research, this dissertation is a mere attempt to expand the concepts of quantum social science to the terrain of sociology and socio-cultural studies. It managed to conceptualize the social structures of the sixties counterculture from a retrospective point of view. However, it is a theoretical composition that requires more developments in future works in order to construct actual current interpretations and solutions for contemporary social structures.

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## **Résumé:**

Au cours des dernières années, la science sociale quantique est devenue la nouvelle notion de tendance pour de nombreux physiciens et théoriciens de tous les aspects des sciences sociales. La présente étude participe également au concept révolutionnaire en quantifiant les structures les plus influentes qui ont conduit à l'essor de la contre-culture américaine des années 1960. La raison derrière la demande récente de la notion alternative est due aux limites des théories sociologiques existantes. Les théories classiques, basées sur Newtonien démontrent des explications unidimensionnelles qui sont considérées comme dépassées et ont tendance à fonctionner dans un mouvement restrictif. Cela a été démontré dans les précédents rendus académiques qui ont défini l'ère dynamique des années 60 d'une manière ou d'une autre. Par conséquent, cette recherche a tenté d'utiliser les principes alternatifs de la mécanique quantique afin de capturer les perspectives multiples de la contre-culture d'une manière holistique et précise. La présente étude a appliqué la méthode d'analyse descriptive et a utilisé l'approche qualitative pour analyser la contre-culture comme étude de cas. En assimilant les principes quantiques dans l'étude socioculturelle des années soixante, le chercheur a pu offrir une meilleure précision que des théories sociologiques classiques en ce qui concerne l'analyse des structures qui ont conduit à la popularité de la contre-culture dynamique. En raison de la nature complexe et non linéaire des deux systèmes, l'étude a pu établir un parallèle entre le système socioculturel et le système microscopique de la mécanique quantique. Cette recherche sert à élargir le domaine multidisciplinaire de la recherche au terrain de la sociologie et des études socioculturelles.

## الملخص

تعتبر العلوم الاجتماعية الكمومية التوجه الجديد للفيزيائيين و الباحثين في جميع جوانب العلوم الاجتماعية ، أخذت الدراسة الحالية كذلك منحى ثوري بتكميم الهياكل الأكثر تأثيرا التي قادت إلى صعود الثقافة الأمريكية المضادة في الستينات . يتمثل السبب الرئيسي وراء الطلب الأخير للمصطلح البديل إلى قيود النظريات الاجتماعية الحالية . ظهرت النظرية الكلاسيكية المستندة إلى النيوتنية بشروح أحادية البعد اللاتي يعتبرن قديمة الطراز كما إنهن يملن إلى العمل في حركة مقيدة و قد يظهر ذلك في كتابات أكاديمية سابقة التي عرّفت حقبة الستينات الديناميكية بطريقة إما/أو. و لذلك يصبو هذا البحث إلى توظيف بدائل أساسية لميكانيكية الكم بهدف التقاط الزوايا العديدة للثقافة المضادة بطريقة كلية و دقيقة ، تطبق الدراسة الحالية الطريقة الوصفية و التحليلية كما أنها استعملت النهج النوعي في الثقافة المضادة و تحليلها كدراسة حالة عبر تمثيل أساسيات الكم في الدراسة الاجتماعية الثقافية خلال حقبة الستينات ، تمكن الباحث من توفير دقة أفضل مم العلوم الاجتماعية الكلاسيكية المعتادة فيما يتعلق بتحليل الهياكل اللاتي أدت إلى شعبيته الثقافة الديناميكية المضادة ، نظرا إلى الطبيعة المستعصية لكلا النظامين ، كانت الدراسة على مقدره من مقارنة النظام الاجتماعي الثقافي مع النظام ألمجهري لميكانيكا الكم. يفيد هذا البحث في زيادة توسع مجال البحث المتعدد التخصصات ليشمل مجال علم الاجتماع و الدراسات الثقافية والاجتماعية.

