The Game of Life and Death: Approaching *Gone Girl* and *Lamb to the Slaughter* through Game Theory.

Dissertation submitted to Mahatma Gandhi University, Kottayam, in partial fulfillment for the

award of M.A degree in English Language and Literature.

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Certificate

This is to certify that the dissertation entitled *The Game of Life and Death: Approaching* Gone Girl *and* Lamb to the Slaughter *through Game Theory* is a bona fide record of sincere work done by, Aparna J, Register Number: 210011004025, Bharata Mata College, in partial fulfillment of the requirement for the degree of Master of Arts in English Language and Literature under the Mahatma Gandhi University, Kottayam during the year 2021-2023.

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<center>Declaration</center>

I, hereby declare that the presented dissertation is based on the research that I did on *The Game of Life and Death: Approaching* Gone Girl *and* Lamb to the Slaughter *through Game Theory* under the supervision and guidance of Dr. Rose Sebastian, Assistant Professor, Post Graduate Department of English, Bharata Mata College, in partial fulfillment of the requirement for the award of the Degree of Master of Arts in English Language and Literature from Mahatma Gandhi University, Kottayam. This is a report of my hands based on the research done on the selected topic and it is my original work and interpretations drawn therein are based on material collected by myself. It has not been previously formed basis for the award of any degree, diploma or fellowship or other similar title or recognition.

Date: 10/09/2023   Aparna J

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This project follows MLA 9th Edition.

Chapter 1

Introduction

Human nature has always been a mystery and throughout history many theorists like psychoanalysts have tried to draw concepts and conclusions to its complex nature. This concept has been studied under many fields like anthropology, economics, psychology and sociology and still draws attention from other fields as well. One of the newest theories to study this complex human nature is Game Theory which initially has a mathematical framework. Analysing human behaviours from a different lens is always an interesting field as generations pass it gets way more complex and hence calls for newer studies. This thought is the inspiration for this project and it tries to analyse how the mathematical framework of game theory can be applied to a literary context.

Game theory is a highly dynamic and rapidly expanding field. It sheds light on many aspects of the social sciences and is based on an elegant and non-trivial mathematical theory. "The mathematical theory of games was first developed as a model for situations of conflict"(Stahl 1). The mathematician John von Neumann and the economist Oskar Morgenstern used it in their book *Theory of Games and Economic Behavior*, which was published in the early 1940s, to apply it to the theoretical study of economics. Since then, its application to the theoretical facets of many social sciences has been expanded to encompass cooperative interactions as well. It has sparked a lot of fundamental research in fields like psychology, economics, evolutionary biology, business and political science. Game theory is still a young and evolving science despite its many advancements.

Game theory provides a theoretical framework for imagining social interactions between rival players. In some ways, game theory is the science of strategy, or at the very least it examines the best course of action for independent, rival players in a strategic situation. In a game theory, a 'player' is a strategic decision maker and a 'game' is a complete plan of action a player will take given the set of circumstances that might arise within the game. A 'strategy' is a complete plan of action a player will take given the set of circumstances that might arise within the game.

The methodology of this research is textual analysis and the film *Gone Girl* and the short story *Lamb to the Slaughter* are considered as texts for the analysis. The project analyses the film and the short story through the lens of game theory. The characters of the works are considered players, and the character motives, as strategy, and the film and story as a game. Through such an analysis, it is possible to delve deeper into the characters' complex human behaviour. It provides answers to questions like why people behave in certain manners, power dynamics, manipulation, and crimes. Game theory provides a different angle to Amy Eliot and Nick Dunne of *Gone Girl,* how and why they are trying to overpower each other. It also explains the motives of Mary Maloney of *Lamb to the Slaughter* and provides a deeper understanding of her strategies.

Gone Girl is a 2014 American psychological thriller film directed by David Fincher and written by Gillian Flynn based on her 2012 eponymous novel. It stars Ben Affleck as Nick Dunne, Rosamund Pike as Amy Eliot, Neil Patrick Harris as Desi Collings, Tyler Perry as Tanner Bolt, Carrie Coon as Margo Dunne, and Kim Dickens as detective Rhonda Boney. In the film, Nick Dunne becomes the prime suspect in the sudden disappearance of his wife Amy in Missouri.

The film opens with the mysterious disappearance of Amy Dunne on the morning of her fifth wedding anniversary. Her husband, Nick Dunne, becomes the prime suspect in her disappearance due to his seemingly odd behaviour and lack of emotional reaction. As the investigation progresses, the media circus intensifies, painting Nick as a potential murderer. The story alternates between present-day events and flashbacks to Amy's and Nick's relationship. These flashbacks reveal that their marriage was not as perfect as it seemed on the surface. Both characters have their flaws and secrets, and their relationship was marked by tension, resentment, and manipulation. Clues left behind by Amy lead the police and the public to believe that Nick is responsible for her disappearance. However, as the investigation deepens, it is revealed that Amy has orchestrated her own disappearance to frame Nick. She meticulously stages evidence to make it appear as though Nick is involved in her disappearance, all as a form of revenge for his perceived mistreatment of her. As the media frenzy intensifies and Nick's public image continues to deteriorate, he hires a high-profile defence attorney to clear his name. The case takes several shocking twists and turns, including revelations about Amy's past and her manipulative behaviour. Nick struggles to navigate the media storm and prove his innocence while uncovering the truth about his wife's disappearance. The truth about Amy's actions is revealed through a series of diary entries she wrote and plans she carried out to frame Nick. The film ends on a tense note as Nick confronts Amy, leading to a complex and ambiguous resolution that leaves the characters' future open to interpretation. The movie is a roller-coaster ride of psychological suspense, showcasing the lengths people will go to in order to maintain control, exact revenge, and manipulate perceptions. The film skilfully weaves together themes of deception, media influence, and the dark complexities of human relationships to create a gripping and thought-provoking narrative. The project aims to give answers to the complexities of the characters.

Lamb to the Slaughter is a short story written by Roald Dahl, first published in 1953. The story is a darkly comedic tale that revolves around a seemingly ordinary housewife named Mary Maloney and the shocking turn her life takes after her husband's unexpected revelation. The story begins with Mary Maloney eagerly waiting for her husband, Patrick Maloney, to return home from work. Patrick is a police officer, and as he enters their home, Mary senses something is wrong. Patrick confesses to her that he wants a divorce, revealing his intention to leave her for another woman. Shocked and unable to comprehend the situation, Mary initially responds with disbelief. In a fit of emotion and desperation, Mary grabs a frozen leg of lamb from the freezer and strikes Patrick on the back of the head, killing him instantly. Overwhelmed by the act she has committed, Mary's mind shifts into survival mode. She begins to plan how to dispose of the evidence and cover up the murder. Mary carefully constructs an alibi by visiting a local grocery store and chatting with the grocer, creating a witness who can vouch for her presence during the time of the murder. She then returns home and discovers her husband's body, pretending to be horrified and shocked by the scene. When the police arrive to investigate Patrick's murder, Mary offers them drinks and is friendly and cooperative. She serves the police officers the very leg of lamb she used to kill her husband, claiming she was too distraught to cook anything else. The police search for the murder weapon, but little do they know it's right in front of them. As the police investigation unfolds, Mary listens to the detectives discuss potential murder weapons, and she inwardly smirks at their inability to identify the lamb as the murder weapon. Her calculated actions successfully divert suspicion away from her. The story ends with the detectives enjoying their meal, completely unaware that they are consuming the evidence of the crime they are investigating. Mary, having successfully executed her plan, reflects on the irony of the situation and the unexpected turn her life has taken. Lamb to the Slaughter is a darkly

humorous exploration of the lengths someone might go to protect themselves in the face of a shocking and life-altering event. The story skilfully combines elements of suspense, irony, and psychological tension, leaving readers with a thought-provoking and unexpected conclusion. Game theory provides answers to why and how such actions occur.

The theorist Antoine Augustin Cournot is one of the early propagators of game theory and later John von Neumann and Oskar Morgenstern popularised the concept with their seminal work. The concept was further discussed by Thomas Schelling. Chapter 2 provides the seminal texts in game theory and the major theorists in detail. It also gives the explanation to the major terms and concepts of the theory in a simplified and non mathematical way appealing for a literature study. Chapter 3 analyses the film and chapter 4 analyses the short story based on the concepts discussed in chapter 2. Chapter 5 is the conclusion and findings of the project. Game theory has not extensively been used in literature and not adequately studied. This theory helps to analyse literature in a more scientific manner.

Chapter 2

Game Theory in Literature

Game theory, a mathematical framework for understanding strategic decision-making, has found use in literature in addition to the fields of economics and social sciences. The concepts in game theory offer a common language for describing, organising, analysing, and ultimately comprehending various strategical scenarios. Game theory often examines conflict scenarios, agent interactions and decisions. A game in the sense of game theory is comprised of a set (usually finite) number of players that interact in accordance with predetermined rules. These participants could be individuals, teams, organizations, businesses, associations, and so on. They are interdependent because their interactions will have an impact on both the individual players and the entire group of players. "The intention of game theory is to produce optimal decision-making of independent and competing actors in a strategic setting" (Hayes, 2023). A game is defined by a group of players and their potential to follow the rules, or more specifically, their sets of strategies. The subject of game theory can also be defined as situations, where the result for a player does not only depend on his own decisions, but also on the behaviour of the other players. "Each actual sequence of choices made by a player over his lifetime can be constructed as a strategy" (Stahl 15). Guillermo Owen mentions in his work *Game Theory* "there is a sequence of personal moves, at each of which one of the players chooses from among several possibilities" (Owen 1).

The contemporary development of game theory started in the mid 20th century, despite the fact that its roots can be found in antiquity. "Applications of game theory to novels, short stories, plays, opera librettos, narrative poems, and the Hebrew Bible are surveyed from both an historical and a critical perspective" (Steven J). A number of notable people introduced the basic

concepts of game theory through numerous publications. The work of French mathematician and economist Antoine Augustin Cournot contains one of the earliest instances of game theory. A mathematical model of duopoly competition was developed by Cournot in his book *Researches into the Mathematical Principles of the Theory of Wealth*, which was published in 1838. Despite the fact that he did not use the phrase 'game theory', his work helped to establish the principles of strategic analysis and the concept of strategic interdependence. John von Neumann and Oskar Morgenstern, who released their ground-breaking book *Theory of Games and Economic Behavior* in 1944, made another important contribution to the growth of game theory. The mathematical foundations of game theory were developed by economist Morgenstern and mathematician Von Neumann, and they were then applied to numerous economic scenarios. They developed ideas like the minimax theorem and zero-sum games. John Nash contributed to the field further by introducing the idea of Nash equilibria in his doctoral dissertation, which was published in 1950, building on the work of von Neumann and Morgenstern. Later, Nash's contributions to game theory were honoured with the 1994 Nobel Prize in Economics. The economist and Nobel laureate Thomas Schelling is renowned for his work on strategic decision-making and conflict resolution. His 1960 work *The Strategy of Conflict* explores the dynamics of bargaining, brinkmanship, and coordination in conflict situations. Schelling's strategic thinking insights have impacted writers who have written on power struggles, social difficulties, and negotiation.

As game theory gained popularity, many academics and economists expanded on its ideas and used them in domains outside economics. For instance, game theory was used in the 1970s and 1980s in the fields of political science, international relations, and evolutionary biology, among others. Game theory has been studied in literature in relation to conflict, strategy, and

decision-making. Game theory has been applied on literary works, academic studies, and philosophical discussions even if it may not have a clear beginning or history in literature as such. Game theory offers a framework for examining characters' goals, plans, and results in literary texts, enhancing our comprehension of how people behave under pressure. "Game theory was designed as a decision-making tool to be used in more complex situations, situations in which chance and your choice are not the only factors operating" (Davis, 4). Kate Salen and Eric Zimmerman, in their book *Rules of Play*: *Game Design Fundamentals*, consolidate multiple game theorists' definitions of 'game', producing the following: 'A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome' (11). These games are created by what Salen and Zimmerman refer to as 'game designers,'. These game designers create 'a game, to be encountered by a player, from which meaningful play emerges' (Salen and Zimmerman 11). While these authors' conception of a game designer refers primarily to the creator 'of games, from computer and video games to parlor games and sports'(Salen and Zimmerman 11), when applied to literature, game-masters are identified not only as the author (or maker) of the text, but as the characters themselves.

The project defines game theory by using non-mathematical description as far as possible, since mathematics is not really required to understand the basic concepts of game theory. Game theory is a vast theory in itself, this paper aims to bring just the basic and simple non-mathematical concepts of game theory for the analysis.

Normal Form Games:

A game in normal form consists of:

1. A finite number of players.

2. A strategy set assigned to each player (e.g. in the Prisoner's Dilemma each player has the possibility to cooperate (C)and to defect (D). Thus his strategy set consists of the elements C and D.

3. A pay-off function, which assigns a certain pay-off to each player depending on his strategy and the strategy of the other players (e.g. in the Prisoner's Dilemma the time each of the players has to spend in prison). The pay-off function assigns each player a certain pay-off depending on his strategy and the strategy of the other players. If the number of players is limited to two and if their sets of strategies consist of only a few elements, the outcome of the pay-off function can be represented in a matrix, the so-called pay-off matrix, which shows the two players, their strategies and their pay-offs. Example:

Player1/player2	Left	Right
Up	1,3	2,4
Down	1,0	3,3

In this example, player 1 (vertical) has two different strategies: Up and Down. Player 2 (horizontal) also has two different strategies, namely Left and Right. The elements of the matrix are the outcomes for the two players for playing certain strategies, i.e., supposing, player 1 chooses strategy Up and player 2 chooses strategy Right, the outcome is (2, 4), i.e., the payoff for player 1 is 2 and for player 2 is 4 (Hotz 3).

Prisoners Dilemma

The story behind this concept: Imagine two suspects, Alice and Bob, who have been arrested for a crime but are held in separate cells and cannot communicate with each other. The

prosecutor lacks sufficient evidence to convict them of the main charge but has enough to charge them with a lesser offense, carrying a moderate prison sentence. The prosecutor makes a deal with each prisoner individually:

- If both Alice and Bob remain silent (cooperate), the prosecutor can only charge them with a minor offense, resulting in a reduced sentence for both.

- If one prisoner betrays the other (defects) by confessing and cooperating with the prosecutor, they will receive a minimal sentence, while the other prisoner who remains silent will face a severe sentence.

- If both prisoners betray each other by confessing, they will both receive a somewhat high sentence, although less severe than if only one of them confessed.

Each prisoner faces a dilemma: they must decide whether to trust the other person and remain silent (cooperate) or betray them (defect) in hopes of receiving a minimal sentence. The key is that the outcome for each prisoner depends on both their own choice and the choice of the other prisoner. The dilemma arises because if both prisoners act rationally and independently seek to minimise their own sentence, the most likely outcome is that they both betray each other (defect), resulting in a suboptimal outcome for both. This outcome is known as the "dilemma" because even though cooperation would lead to a better collective outcome, each prisoner's individual incentive is to defect.

The story of the Prisoner's Dilemma highlights the tension between individual self-interest and cooperation. It demonstrates how even when cooperation would be mutually beneficial, the lack of communication and trust between self-interested individuals can lead to suboptimal outcomes. The Prisoner's Dilemma has numerous applications beyond criminal

scenarios, such as understanding cooperation in business, politics, economics, and social situations where individuals face similar trade-offs between self-interest and collective benefit.

Nash Equilibrium

Nash equilibrium is a concept in game theory that represents a stable outcome in a game where no player has an incentive to unilaterally change their strategy. In other words, each player's strategy is the best response to the strategies of the other players. Formally, in a game with two or more players, a Nash equilibrium is a set of strategies, one for each player, where no player can improve their pay-off by changing their strategy while the other players keep their strategies unchanged. Let us use the pay-off matrix of the Prisoner's Dilemma to determine the Nash equilibrium. Consider a two-player game with Player A and Player B.

PlayerA/PlayerB	Strategy 1	Strategy 2
Strategy 1	(2,2)	(0,3)
Strategy 2	(3,0)	(1,1)

In this matrix, the numbers in parentheses represent the payoffs for Player A and Player B, respectively. The first number in each cell represents the payoff for Player A, while the second number represents the payoff for Player B.

For Player A:

- If Player B chooses Strategy 1, Player A receives a payoff of 2 when choosing Strategy 1 and a payoff of 3 when choosing Strategy 2.

- If Player B chooses Strategy 2, Player A receives a payoff of 0 when choosing Strategy 1 and a payoff of 1 when choosing Strategy 2.

Based on these payoffs, Player A's best response is to choose Strategy 1 when Player B chooses Strategy 1, and to choose Strategy 2 when Player B chooses Strategy 2.

For Player B:

- If Player A chooses Strategy 1, Player B receives a payoff of 2 when choosing Strategy 1 and a payoff of 0 when choosing Strategy 2.

- If Player A chooses Strategy 2, Player B receives a payoff of 3 when choosing Strategy 1 and a payoff of 1 when choosing Strategy 2.

Based on these payoffs, Player B's best response is to choose Strategy 1 when Player A chooses Strategy 1, and to choose Strategy 2 when Player A chooses Strategy 2.

Finding Nash equilibrium by identifying the combination of strategies where both players' choices are their best responses to each other. In this case, the Nash equilibrium occurs when Player A chooses Strategy 1 and Player B chooses Strategy 2. This is because Player A's best response to Player B's Strategy 2 is Strategy 1, and Player B's best response to Player A's Strategy 1 is Strategy 2. Therefore, (Strategy 1, Strategy 2) is the Nash equilibrium in this game. A Nash equilibrium is reached when both players choose strategies that are their best responses to each other's strategies. In the given example, the Nash equilibrium is (Strategy 1, Strategy 2) with payoffs (2,0) for Player A and (0,3) for Player B.

Bayesian Game

A Bayesian game is an extension of the standard game theory framework that incorporates elements of uncertainty and incomplete information. It allows for modelling situations where players have private information about the state of the world, and they make decisions based on their beliefs about the other players' information and strategies. In a Bayesian game, players have beliefs or probability distributions over the possible states of the world. Each player's type represents their private information, which could be their preferences, private knowledge, or other characteristics relevant to the game. The players' strategies and payoffs depend not only on their own type but also on their beliefs about the types of other players. The concept of Bayesian games was introduced by Harsanyi (1967) and later formalized by Osborne and Rubinstein (1994) in the book *A Course in Game Theory*. However, the development and application of Bayesian games have been further advanced by many other researchers in the field of game theory and economics.

John C. Harsanyi, a Hungarian-American economist and Nobel laureate, played a significant role in the development and promotion of Bayesian games. He was awarded the Nobel Prize in Economic Sciences in 1994 for his pioneering work on the analysis of incomplete information in economic systems, including Bayesian games. Harsanyi's research laid the foundation for understanding how individuals with private information make decisions in situations involving uncertainty and strategic interactions.

Tit-for-Tat Strategy

The Tit-for-Tat strategy is a simple and well-known strategy used in repeated games. It is based on the principle of reciprocity, where a player's action is based on the previous action of their opponent. The strategy's basic rule is to initially cooperate and then mimic the opponent's last move in subsequent rounds. In other words, if the opponent cooperates, the player cooperates

as well, and if the opponent defects, the player defects in response. The Tit-for-Tat strategy was introduced by Robert Axelrod and further popularised through his book *The Evolution of Cooperation* (1984). Axelrod conducted computer tournaments where different strategies competed against each other in iterated prisoner's dilemma games. Surprisingly, Tit-for-Tat emerged as one of the most successful strategies, as it was cooperative, forgiving, and not overly exploitable.

Cat and Mouse Play

The Cat and Mouse play is a concept that describes a dynamic often observed in sequential games where one player tries to catch or pursue another player. The term 'Cat and Mouse' is derived from the common analogy of a cat chasing a mouse. The Cat and Mouse play can be seen in games such as hide-and-seek or pursuit-evasion scenarios. It involves a strategic interaction where one player (the mouse) tries to evade or avoid capture by the other player (the cat) through strategic movements and decision-making. The cat player, on the other hand, aims to anticipate the mouse's moves and strategically position themselves to catch the mouse. The Cat and Mouse play has been studied in various contexts, including military operations, economics, and evolutionary game theory. While there isn't a specific theorist associated with this concept, it has been discussed by researchers exploring strategic interactions with pursuit and evasion dynamics.

Game theory have extensive applications in literature, economics and business, politics and international relations and even can be applied to analyse daily life. "Game theory provides the most satisfying and conclusive information and analyzation in simpler games or scenarios— those with fewer decision makers and fewer choices" (Simley, 2023). By considering the incentives, payoffs, and strategies of different players, game theory can provide insights into

market dynamics, negotiation strategies, and the outcomes of strategic decisions in real-world economic scenarios. They can help explain phenomena like cooperation in public goods dilemmas, the emergence of trust and reciprocity, and the impact of punishment and reward systems on collective outcomes. Game theory provides insights into how individuals navigate social dilemmas and make decisions that balance self-interest with the welfare of the group. The above-mentioned theories are applied to the movie *Gone Girl* and the story *Lamb to the Slaughter* in the next two chapters to navigate deep into the characters' motifs and modi operandis.

Chapter 3

Game theory in *Gone Girl*

The psychological thriller movie *Gone Girl* directed by David Fincher can be analysed through the lens of game theory in order to know the depths of character motivations, interactions, and narrative structures. Game theory stimulates our study to explore the complexities of human behaviour, strategic thinking and the consequences that arise from the characters' choices and actions.

As the previous chapter has already dealt with different theories and theorists of game theory, this chapter applies the different concepts of game theory into the movie. When applying game theory into the movie, it involves analysing the interactions, choices and strategies of the characters. Conflictual situations or any other type of interaction will be referred to as 'games', and they have participants who are referred to as 'players' by definition. The project focuses exclusively on situations with two players. The major characters of *Gone Girl* are Amy Elliott Dunne and Nick Dunne and the movie revolves around their constant battle to overpower each other in the game of marriage.

Information asymmetry of game theory plays a crucial role in driving the narrative and shaping the characters' actions. The protagonist Nick Dunne finds himself in a complex situation where he becomes a suspect in the disappearance of his wife Amy. Information asymmetry refers to a situation where one party has more or better information than the other involved in a transaction or interaction. In *Gone Girl*, Amy manipulates the situation to create a significant information imbalance between herself and Nick, giving her a strategic advantage. Throughout the film, Amy uses her knowledge of Nick's behaviour, weaknesses, and secrets to meticulously

plan her disappearance and frame him for her murder. She carefully stages the crime scene, leaving behind evidence that points to Nick's guilt. By doing so, she creates a situation where the information available to Nick is limited and misleading, while she possesses detailed knowledge of the truth.

"I know sometimes you think you are moving through this world alone, unseen, unnoticed. But don't believe that for a second. I have made a study of you. I know what you are going to do before you do it. I know where you've been and I know where you're going. For this anniversary, I've arranged a trip: Follow your beloved river, up up up!"(Gone Girl 1:13:44-1:13:58)

Amy understands the power of information and how it can shape perceptions and outcomes in her favour. Nick, on the other hand, is initially unaware of Amy's deceit and is at a disadvantage due to the lack of information about her plans and motivations.

"When I think of my wife, I always think of the back of her head. I picture cracking her lovely skull, unspooling her brain, trying to get answers. The primal questions of a marriage: What are you thinking? How are you feeling? What have we done to each other?"(Gone Girl 00:00:23-00:00:50)

He finds himself playing a game in which the rules are constantly changing, and he must navigate through a maze of uncertainties and hidden truths. As the story progresses, Nick begins to uncover some of the secrets and lies that Amy has meticulously constructed. He starts to gain access to information that was previously hidden from him, gradually reducing the information asymmetry between them. This shift in the balance of information alters the dynamics of their 'game' and leads to a series of dramatic twists and turns in the plot to regain control.

The concept of information asymmetry also extends to other characters in the story. Supporting characters, such as Amy's ex-boyfriend Desi Collings and her parents, are kept in the dark about Amy's true intentions and actions. They operate based on incomplete information, leading to their manipulation and vulnerability within the game Amy has orchestrated. Throughout the narrative, *Gone Girl* showcases how information asymmetry can be leveraged as a strategic tool, creating an unbalanced playing field and influencing the characters' decisions and actions.

In *Gone Girl*, the characters engage in various forms of strategic interaction, employing tactics and manoeuvres to gain advantage over each other.

Amy's framing of Nick: In the story, Amy carefully plans her disappearance and frames her husband, Nick, for her murder. This act is a strategic move aimed at exacting revenge and regaining control over their failing marriage. By strategically leaving behind clues and manipulating the evidence, Amy aims to ensure Nick's arrest and subsequent punishment.

Nick's public image management: As the investigation unfolds and suspicion falls on him, Nick employs strategic decision-making to manage his public image. He realises the importance of presenting himself as innocent and sympathetic to the public, which involves carefully calculated actions and statements designed to influence public opinion and maintain his freedom.

"All I'm trying to do is being nice to the people who are volunteering to help find Amy."(Gone Girl 00:38:11-00:38:16)

The 'cool girl' facade: Amy has created an elaborate persona of the 'cool girl' to fit into Nick's idealised version of her. This can be seen as a strategic move to manipulate Nick's

perception of her and control the dynamics of their relationship. Amy's ability to maintain this facade and carefully manage Nick's expectations serves as a strategic tool in her larger plan.

> "Cool girl is hot. Cool girl is game. Cool girl is fun. Cool girl never gets angry at her man. She only smiles in a chagrined, loving manner. And then presents her mouth for fucking. She likes what he likes, so evidently he's a vinyl hipster who loves fetish Manga. If he likes girls gone wild, she's a mall babe who talks for football and endures buffalo wings at Hooters. When I met Nick Dunne I knew he wanted 'Cool girl'. And for him, I'll admit: I was willing to try."(Gone Girl 1:10:35-1:11:07)

The treasure hunt: Amy stages an intricate treasure hunt for Nick, leaving him a series of clues to find her. This treasure hunt is a strategic interaction aimed at keeping Nick engaged, manipulating his emotions, and ensuring his compliance with her plan. By creating this game-like scenario, Amy exerts control over the situation and influences Nick's actions.

"Make sure the cops will find it. Finally, honour tradition with a very special treasure hunt. And if I get everything right, the world will hate Nick for killing his beautiful, pregnant wife."(Gone Girl 1:09:38-1:09:56)

Amy's Manipulative Letters: Amy writes a series of manipulative letters, designed to control Nick's actions and emotions. She strategically reveals information to unsettle him and maintain control over the situation, using psychological manipulation to force him to act in certain ways.

Nick's Investigation: As Nick investigates Amy's disappearance and seeks to clear his name, he strategically navigates through clues and evidence. He carefully plans his actions to uncover the truth and protect himself, considering the potential consequences of each move.

Amy's Return and Revelation: When Amy reappears, she strategically unveils her true intentions and the extent of her manipulations. She deliberately orchestrates a shocking revelation, playing mind games with Nick and further asserting her control over him.

These strategic interactions demonstrate the characters' calculated decision-making, the use of deception, and the constant manipulation of the narrative to gain advantage or maintain control. Nick and Amy constantly adapt their strategies, anticipate each other's moves, and engage in a psychological battle to outmanoeuvre one another.

Strategic interactions in *Gone Girl* can be analysed using a matrix representation, by simplifying the narrative and abstract it into a game-theoretic framework. The following hypothetical scenario showcases the main characters' strategic choices in a simplified form:

Let's consider a two-player game involving Nick and Amy. Each player has two strategies: 'Stay' or 'Betray'. The strategies represent their choices regarding their relationship and their actions towards each other.

Assuming the following payoffs:

-If both players choose 'Stay', they both receive a payoff of 3.

-If both players choose 'Betray', they both receive a payoff of 1.

-If one player chooses 'Stay' and the other chooses 'Betray', the player who betrays receives a payoff of 4, while the player who stays receives a payoff of 0.

Representing the payoffs in a matrix form, commonly referred to as a payoff matrix:

Amy

	Stay	Betray
Stay	3,3	0,4
Betray	4,0	1,1

Nick

In this matrix, the first number in each cell represents Nick's payoff, and the second number represents Amy's payoff. For example, if Nick chooses 'Stay' (row) and Amy chooses 'Betray' (column), Nick receives a payoff of 0, and Amy receives a payoff of 4.

Analysing this matrix, we can identify potential Nash equilibria, where neither player has an incentive to unilaterally deviate from their chosen strategy. In this case, we can see that (Betray, Betray) is a Nash equilibrium since both players receive a higher payoff by betraying each other than by staying together.

To analyse the application of Nash equilibrium and the concept of Prisoners Dilemma, we can construct a simplified hypothetical matrix that captures the strategic interactions between Nick and Amy, the main characters in the story. This matrix represents the outcomes or payoffs associated with different combinations of strategies chosen by Nick and Amy.

Matrix Representation:

Nick's Strategy

	Corporate	betray
Corporate	reward(R,R)	punish(S,T)
betray	tempt(T,S)	null(P,P)

Amy's Strategy

In this matrix:

The classic game theory scenario of the Prisoner's Dilemma, that involves two players who must decide whether to cooperate or betray each other, can be observed in *Gone Girl*:

Trust and betrayal: Both Nick and Amy grapple with issues of trust and betrayal. They must decide whether to cooperate with each other or act in their own self-interest.

Potential Outcomes: The Prisoner's Dilemma typically presents four possible outcomes: reward, punish, tempt, and null.

Decision-Making: The Prisoner's Dilemma revolves around rational decision-making, weighing the potential benefits and risks of cooperation and betrayal. Similarly, in *Gone Girl*, both Nick and Amy make strategic choices based on their perceived self-interest, analysing the potential outcomes and considering the consequences of their actions.

Manipulation and Uncertainty: Unlike a traditional Prisoner's Dilemma, *Gone Girl* incorporates elements of psychological manipulation, deceit, and uncertainty. Nick and Amy constantly adapt their strategies, manipulate each other, and introduce unexpected factors into the decision-making process.

-'Cooperate' represents a choice where both Nick and Amy work together or maintain a positive relationship.

-'Betray' represents a choice where one or both characters act against each other's interests.

-'Reward' represents the outcome when both Nick and Amy cooperate, resulting in a positive outcome for both (R, R).

-'Punish' represents the outcome when Nick betrays Amy, leading to a negative outcome for Amy while benefiting Nick (S, T).

-'Tempt' represents the outcome when Amy betrays Nick while he cooperates, resulting in a negative outcome for Nick while benefiting Amy (T, S).

-'Null' represents a situation where both Nick and Amy betray each other, leading to a negative outcome for both (P, P).

Analysing the potential Nash equilibrium in this scenario:

Reward (R, R): If both Nick and Amy cooperate, they achieve a mutually beneficial outcome, denoted as (R, R). In this situation, both characters have chosen a strategy that maximises their individual benefits, given the other's cooperation. Neither Nick nor Amy has an incentive to unilaterally deviate from their choice, as doing so would result in a less favourable outcome for themselves. Thus, this outcome can be considered a potential Nash equilibrium.

Null (P, P): If both Nick and Amy betray each other, they end up with a negative outcome for both, represented as (P, P). In this situation, neither character has an incentive to change their strategy, as any unilateral deviation would lead to a less desirable outcome. While this outcome is not beneficial for either character, it represents a potential Nash equilibrium in which neither has an incentive to change their action.

Deception and trust are central themes in both game theory and *Gone Girl*. Game theory explores how individuals strategically make decisions in situations involving conflicting interests, and deception and trust play crucial roles in shaping those decisions. Both Amy and Nick engage in deceptive behaviours to manipulate each other and the people around them. Amy's disappearance and framing of Nick is an elaborate deception, designed to exact revenge

and regain control over their deteriorating marriage. Nick, in turn, deceives Amy and others as he uncovers her actions and plans his own counter-strategies.

"Come home, Amy. I dare you"(Gone Girl 2:02:16-2:02:18)

Deception in game theory often stems from information asymmetry. Amy initially holds the advantage of information asymmetry, carefully crafting her disappearance and leaving Nick in the dark about her true intentions. This allows her to control the narrative and manipulate others to serve her purposes. Trust, on the other hand, is a crucial element in game theory for achieving mutually beneficial outcomes. In strategic interactions, trust enables cooperation and collaborative decision-making. However, in *Gone Girl*, trust is constantly tested and shattered as the characters uncover each other's deceptions.

"You two are the most fucked up people I've ever known"(Gone Girl 2:16:25-2:16:28)

Throughout the story, the characters struggle with issues of trust. Nick wrestles with whether he can trust Amy, given her elaborate schemes and manipulative nature. Amy, too, finds it difficult to trust Nick due to his infidelity and his subsequent attempts to expose her actions. The breakdown of trust further fuels their deceptive behaviours, creating a cycle of betrayal and retaliation.

"What have we done to each other? What will we do?"(Gone Girl 2:24:28-2:24:33)

The Interplay between deception and trust in *Gone Girl* showcases the psychological complexity of strategic decision-making and the fragile nature of relationships. It highlights the consequences of broken trust and the lengths to which individuals may go to deceive and protect themselves. The story demonstrates how deception can undermine trust, leading to a heightened sense of suspicion and the erosion of genuine connections between people.

In *Gone Girl*, the concept of the tit-for-tat strategy from game theory can be traced in the dynamic between Amy Dunne and Nick Dunne. This strategy is often used to promote cooperation and discourage betrayal in repeated games. In the movie, Amy employs a tit-for-tat strategy to manipulate and control Nick. When she discovers his infidelity, she meticulously plans her disappearance and frames him for her murder as a way to exact revenge. By doing so, she initiates a cycle of retaliation, where she responds with calculated moves to Nick's perceived betrayal. Nick, initially unaware of Amy's actions and motivations, finds himself trapped in a game where he must respond to Amy's moves. He tries to prove his innocence and navigate the situation, but Amy's careful planning and manipulation keep him on the defensive. As the story progresses, Nick's actions become reactionary, driven by the need to counter Amy's moves and protect himself. The tit-for-tat strategy is also reflected in the characters' interactions with others in the story. For example, Amy uses her diary entries to present herself in a sympathetic light and elicit support from the public, while simultaneously framing Nick as the villain.

> " I will practice believing my husband loves me, and will love this baby. That this child might really save our marriage. But I could be wrong. Because sometimes, the way he looks at me, I think, man of my dreams, father of my child, this man of mine may kill me. He may truly kill me."(Gone Girl 1:04:59-1:05:40)

Nick, in turn, tries to gather evidence and expose Amy's true nature, mirroring her strategy of retaliation.

> "Then we'll need to realign the public's perception of Amy. Make them stop seeing her as America's sweetheart and see her for what a mind-fucker of the first degree "(1:21:12)

"So I pretended to be better than I was. When we got married I promised to be that guy"(Gone Girl 1:52:31-1:52:37)

"How did she manage to get a hold of a box cutter if he had her tied up the whole time?"(Gone Girl 2:09:33-2:09:36)

The tit-for-tat strategy in *Gone Girl* creates a cycle of reciprocal actions and reactions, intensifying the tension and psychological warfare between the characters. It demonstrates how game theory principles can be applied to manipulate and control others in a strategic game of deception and revenge.

Hypothetical scenarios in *Gone Girl* that can be analysed using the following game theory concepts:

Strategic Considerations

When contemplating strategic betrayal, Nick must weigh the potential benefits and risks. He must consider:

-The credibility and impact of the evidence he possesses against Amy.

-The potential consequences if Amy counters his betrayal or manipulates public perception.

-The public's reaction and their perception of Nick's actions.

-The long-term implications for his own reputation and future relationships.

Psychological Manipulation:

Scenario: Amy, aware of Nick's affair, decides to psychologically manipulate him by making him believe she is pregnant with his child.

Analysis: This scenario involves elements of a Bayesian game. Amy's goal is to shape Nick's behaviour and ensure his compliance by leveraging his desire to protect his family. Nick must assess the credibility of Amy's claim and decide whether to cooperate (support Amy during the pregnancy) or betray (challenge the legitimacy of the pregnancy). The payoffs will depend on the accuracy of Amy's claim and the potential consequences of Nick's actions.

Power Dynamics:

Scenario: Nick, realising Amy's control over their relationship, decides to assert his power by publicly revealing her manipulative nature.

Analysis: This scenario can be examined through the lens of game theory's power dynamics. Nick's move can be seen as an attempt to shift the balance of power and gain an advantage. Amy, in response, may strategically counteract his actions by manipulating public perception or employing psychological tactics. The outcome depends on the strategic choices made by both characters and their ability to outmanoeuvre each other.

In *Gone Girl*, elements of a sequential game can be observed in the dynamic between Nick and Amy as they strategically navigate their actions and responses. Exploring the sequential game framework applies to certain aspects of the movie:
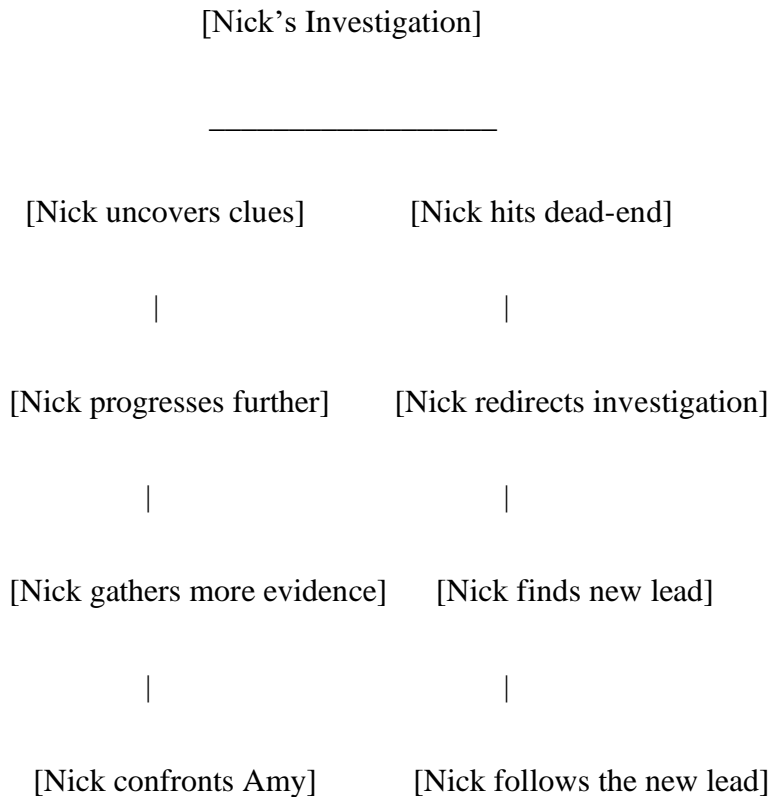
Sequential Decision-Making: A sequential game involves players making decisions in a specific order, knowing that each subsequent decision is influenced by prior actions. Both Nick and Amy make sequential decisions as they respond to each other's actions, creating a strategic interplay between them.

Dynamic Decision Tree: A sequential game can be visualised as a decision tree, where each player's choices and subsequent outcomes are mapped out. In *Gone Girl*, Nick and Amy's

decisions create a dynamic decision tree as their actions branch out and impact future choices and consequences.

A decision tree is a visual representation of a sequential game, showcasing the decisions and potential outcomes at each stage. In *Gone Girl*, the dynamic decision tree of Nick's investigation can be illustrated as follows:

[Nick's Investigation]

_____

[Nick uncovers clues]   [Nick hits dead-end]

| |

[Nick progresses further]   [Nick redirects investigation]

| |

[Nick gathers more evidence]   [Nick finds new lead]

| |

[Nick confronts Amy]   [Nick follows the new lead]

This simplified decision tree demonstrates a few possible branches of Nick's investigation. At each stage, he makes choices that lead to different outcomes, influencing subsequent decisions and the overall progression of the game.

Game of Cat and Mouse: The sequential nature of their interactions creates a game of cat and mouse, with each character trying to outmanoeuvre the other. Nick's investigation prompts

Amy to take strategic actions to protect herself and maintain control, while Nick must navigate

her counter-moves and adjust his strategy accordingly.

By employing game theory as an analytical tool, a fresh perspective is given to the

psychological manipulation, power dynamics, and moral dilemmas portrayed in *Gone Girl*. It

aims to bridge the gap between literature and game theory, showcasing the relevance and

applicability of strategic decision-making models in the context of a thrilling and suspenseful

narrative. By examining the strategic elements and uncovering the hidden motivations of *Gone

Girl*, it explores the consequences of different choices, and gain a deeper appreciation for the

complexities of human behaviour depicted in the novel.

Chapter 4

Game theory in *Lamb to the Slaughter*

Roald Dahl situates *Lamb to the Slaughter* in a patriarchal society and cleverly subjects his characters to reversal of roles. Mary Maloney is seen waiting for her husband eagerly and shows great enthusiasm in serving him just as a typical house wife, but rises to great power and genius when she understood that everything was in wain. Even though it is a very short story, many themes like gender and marriage, role reversal, betrayal, vengeance etc. can be seen. Such themes can be analysed further using game theory and draw a better and systematic understanding on the character's motives. Mary Maloney, Patrick Maloney and the detectives are the players of the game here. The game begins when Patrick announces that he no longer wants to stay in the marriage which distresses Mary. Initially, Mary was unaware and not ready for such a turn in her life. So, the first move of the game is from Patrick and he holds the crucial information about their marriage which leads to an information asymmetry because Mary is unaware of this crucial information. Later, this element of information asymmetry changes to Mary as she got the upper stance of the game and holds all the major information through out the story.

There is a clear information asymmetry between Mary Maloney and the investigating officers. After she murders her husband, Mary works to conceal her crime and manipulates the situation to her advantage. The investigating officers, on the other hand, are initially unaware of her involvement and lack crucial information. Mary strategically presents herself as a grieving and innocent wife, effectively concealing her true actions. The officers, unaware of her guilt, approach her with a sense of trust and vulnerability due to the asymmetry of information. They rely on her cooperation and assistance in their investigation, unknowingly interacting with the

perpetrator of the crime. This information asymmetry gives Mary a significant advantage in shaping the narrative and controlling the investigation. It allows her to actively participate in the investigation, mislead the officers, and even serve them the murder weapon itself, the cooked leg of lamb, further distorting their perception of the events. The story demonstrates how information asymmetry can be exploited to manipulate others and influence the outcomes of strategic interactions. Mary's ability to withhold crucial information about her crime and deceive the investigating officers creates a power dynamic that favours her position.

Strategic interactions in game theory involve decision-making where one's choices are influenced by the actions and choices of others. In *Lamb to the Slaughter,* Mary Maloney engages in a series of strategic interactions as she navigates the aftermath of her husband's revelation and her subsequent actions. After committing the murder, Mary shifts her focus to the strategic interactions with the investigating officers. She cleans herself up, changes her appearance, and deliberately manipulates her behaviour to appear innocent and distraught. Her actions are aimed at deflecting suspicion and misleading the officers, thereby maximizing her chances of escaping punishment. She quickly thinks about her and her unborn child and wanted to escape the consequences of murder. She pretends that nothing is wrong with their marriage and appears to be a loving wife and Patrick as a loving husband. She strategically manipulates the detectives as well as the grocery shopkeeper Sam. She appears very well, fit into a beautiful evening spend with her tired husband. Everything was very well executed from dressing, buying vegetables and even the screaming and shock that she acted after finding her husband fallen down at the house. She really did know how to act so naturally, and whom to call in such a situation.

"No, I've got meat, thanks. I got a nice leg of lamb from the freezer." (Dahl 106).

"Therefore, when she entered the kitchen by the back door, she was humming a little tune to herself and smiling. "Patrick!" she called. "How are you, darling?" (Dahl 107).

Mary's most significant strategic move occurs when she serves the cooked leg of lamb to the investigating officers. This action is calculated to create an alibi and further distance herself from the crime. By destroying the murder weapon and providing an alternative explanation for Patrick's death, she aims to eliminate evidence that could incriminate her. The officers' interactions with Mary shape their perceptions and influence their investigative decisions.

"They didn't have any heavy metal vases, she said. "Or a big spanner?"

She didn't think they had a big spanner. But there might be some things like that in the garage." (Dahl 109).

She strategically redirects the investigating officers away from the murderer. She acts as an innocent pregnant wife who is all weak from the sudden demise of her husband and strategically makes the officers 'eat' the weapon.

"'Please', she begged. 'Please eat it. Personally I couldn't tough a thing, certainly not what's been in the house when he was here. But it's all right for you. It'd be a favour to me if you eat it up. Then you can go on with your work again afterwards.'"(Dahl 110).

A strategic investigation can be also seen at the part of investigation officers. The police officers engage in strategic investigation by gathering information about the crime scene, the victim, and the potential suspects. They carefully examine the evidence, interview witnesses, and collaborate with each other to build a comprehensive understanding of the case. This strategic information gathering is akin to players in a game seeking to gather as much relevant information as possible to make informed decisions. Game theory emphasizes rational decision-

making in order to maximize one's own outcomes. The police officers in *Lamb to the Slaughter* make strategic decisions based on the available information. They formulate hypotheses, assess the credibility of witnesses, and consider different scenarios to identify the most likely culprit. Their decisions are influenced by their understanding of the case and their strategic thinking. The police officers engage in strategic questioning and interrogation techniques to extract information from witnesses and potential suspects. They employ tactics such as building rapport, applying pressure, and observing verbal and non-verbal cues to gather valuable information and potentially uncover the truth. This strategic approach aims to manipulate the situation in their favor and elicit relevant details that can aid in solving the case. In game theory, the presence of hidden information can significantly impact decision-making, which again goes back to information asymmetry. The police officers are unaware that the murder weapon, the leg of lamb, was consumed by them during their visit to Mary's house.

"Personally, I think it's right here on the premises."(Dahl 110).

This hidden information affects their investigation, as they do not suspect Mary as the perpetrator and are unaware of the evidence that lies within their own bodies.

By analysing the actions of the police officers in terms of strategic investigation, we can see how they employ game theory principles to gather information, make decisions, and attempt to solve the case. The strategic thinking and decision-making of the investigators add complexity and intrigue to the narrative of *Lamb to the Slaughter*.

The concept of sequential games from game theory can be applied to *Lamb to the Slaughter* to analyse the strategic interactions that occur in a specific order. In the story, we can identify a sequential game between Mary Maloney and her husband Patrick. The first sequential

game element is the order of decision making. In a sequential game, players make decisions in a specific order, and each player's decision can be influenced by the actions of the previous player. Mary's husband takes the first step by revealing his intention to leave. This decision initiates the sequential game, setting the stage for Mary's subsequent actions.

"'For God's sake,' he said, hearing her, but not turning around. 'Don't make supper for me. I'm going out.'

At that point Mary Maloney simply walked up behind him and without any pause she swung the big frozen leg of lamb high in the air and brought it down as hard as she could on the back of his head"(Dahl 105-106)
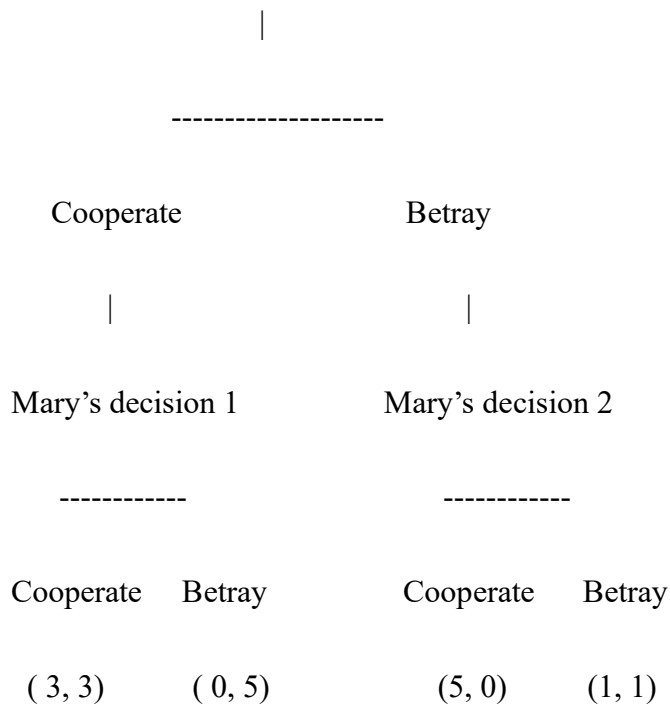
Strategic response is another element of sequential game found in *Lamb to the Slaughter*. Mary's husband's decision to leave creates a strategic situation for Mary. She is faced with the choice of how to respond to his announcement. Mary's subsequent decision to murder her husband with a frozen leg of lamb is a strategic response to his action. Her choice is influenced by his decision, and she formulates her plan accordingly. The last one found in the story is the consequences of sequential decisions. The sequential nature of the game influences the outcomes and consequences of the decisions made by Mary and her husband. Mary's decision to murder her husband has a profound impact on the story's progression, leading to unforeseen consequences and altering the dynamics of the situation. The sequence of decisions made by the characters sets off a chain of events with escalating stakes. By analysing the story as a sequential game, it can be understood how the actions and decisions of the characters unfold in a specific order, shaping the subsequent choices and outcomes. Mary's response to her husband's decision drives the narrative forward, demonstrating the strategic thinking and consequences that arise in a sequential game.

Dynamic decision tree

To analyse the strategic decisions in *Lamb to the Slaughter* using a dynamic decision tree, we can outline the sequential choices made by Mary Maloney and their consequences.

A simplified representation of a dynamic decision tree:

Decision 1: Patrick's decision

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                    |

            --------------------

     Cooperate                 Betray

         |                       |

Mary's decision 1        Mary's decision 2

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Cooperate    Betray        Cooperate    Betray

 ( 3, 3)     ( 0, 5)         (5, 0)      (1, 1)
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Decision 1: Patrick's Decision: This is the starting point, where Patrick decides whether to cooperate or betray by revealing his intention to leave. His decision sets the stage for the subsequent choices and outcomes.

Mary's Decision 1: Depending on Patrick's choice, Mary has two options: cooperate or betray.

-If Patrick cooperates (Cooperate in Mary's Decision 1), Mary can choose to cooperate as well. This leads to an outcome of (3, 3), representing a relatively positive result for both parties.

-If her Patrick betrays (Betray in Mary's Decision 1), Mary can decide to either cooperate or betray. If she chooses to betray by murdering her husband, the outcome is (0, 5), where Mary gains a sense of revenge, but her husband faces the loss of his life.

-If her Patrick cooperates and Mary chooses to betray (Cooperate in Mary's Decision 2), the outcome is (5, 0), where Mary gains the upper hand by successfully executing her plan, while her husband faces the loss of his life.

-If both Mary and Patrick betray each other (Betray in Mary's Decision 2), the outcome is (1, 1), representing a mutual negative result where both parties suffer harm.

Each branch in the decision tree represents a specific choice made by Mary or her husband, leading to a particular outcome. By examining this dynamic decision tree, we can visualize the strategic choices and their potential consequences in *Lamb to the Slaughter*. The dynamic decision tree is just another way to analyse the strategic decision making.

The tit for tat strategy is clearly depicted in Mary's action of killing Patrick. Mary's actions after her husband Patrick reveals his intention to leave her can be seen as a form of retaliation or response. Instead of cooperating or accepting Patrick's decision, Mary decides to take matters into her own hands and retaliates by murdering him with the leg of lamb. Mary's act of retaliation is a direct response to Patrick's betrayal in her eyes. Mary's sudden action of blowing so hardly with the frozen lamb on Patrick's head came as a response of his sudden break from marriage and Mary's action can be seen in terms of responding to an opponent's action in a reciprocal manner.

Prisoners dilemma

In *Lamb to the Slaughter*, we can draw a parallel between Mary Maloney's situation and the concept of the Prisoner's Dilemma. After her husband, Patrick, reveals his intention to leave her, Mary finds herself facing a critical decision. She can choose to cooperate and accept Patrick's decision, potentially leading to negative outcomes such as the loss of her home, reputation, and stability. Alternatively, she can betray Patrick by retaliating against him, which could have severe consequences if she is discovered. Mary's decision to betray Patrick by murdering him with the leg of lamb can be seen as a response to the perceived betrayal in the context of a Prisoner's Dilemma-like situation. She believes that if she cooperates and accepts Patrick's decision, she will suffer negative consequences. Instead, she chooses to betray him, taking matters into her own hands to secure a more favourable outcome for herself. Mary's subsequent actions involve elements of strategic decision-making and manipulating the situation to her advantage, which aligns with the strategic considerations in the Prisoner's Dilemma. She carefully plans and executes her actions, concealing her involvement in the murder and creating an alibi to avoid suspicion.

To apply the Prisoner's Dilemma to *Lamb to the Slaughter*, a simplified payoff matrix is constructed representing the strategic choices made by Mary Maloney and her husband.

Patrick's choice

	Corporate	Betray
Corporate	(3,3)	(0,5)
Betray	(5,0)	(1,1)

Mary's Choice

In this matrix, the numbers represent the payoffs for Mary and her husband, respectively. The first number in each cell corresponds to Mary's payoff, while the second number represents her Patrick's payoff.

-(3, 3): If both Mary and Patrick cooperate, choosing not to betray each other, they both receive a payoff of 3. This represents the best mutual outcome, where they maintain their marriage and avoid any harm.

-(0, 5): If Mary cooperates by not betraying Patrick, but Patrick chooses to betray her by leaving, Mary receives a payoff of 0 (representing the loss of her marriage), while Patrick receives a higher payoff of 5 (representing his newfound freedom).

-(5, 0): If Mary decides to betray Patrick by murdering him, while Patrick chooses to cooperate by not leaving, Mary receives a higher payoff of 5 (representing her sense of revenge and avoiding an unhappy marriage), while Patrick receives a payoff of 0 (representing his loss of life).

-(1, 1): If both Mary and Patrick betray each other, with Mary murdering Patrick and Patrick revealing his intention to leave, they both receive a payoff of 1. This represents the worst mutual outcome, where they both suffer harm and loss.

The payoff matrix illustrates the conflicting interests and potential outcomes resulting from different choices in *Lamb to the Slaughter*. It demonstrates the dilemma faced by Mary and Patrick, as each of them has an incentive to betray the other for personal gain, potentially leading to suboptimal outcomes.

In the above matrix, the Nash equilibrium occurs when neither player has an incentive to change their strategy given the other player's strategy. Analysing the possible Nash equilibria:

-(Cooperate, Cooperate): If Mary chooses to cooperate by not betraying her husband, the best response for her husband is also to cooperate. In this case, they both receive a payoff of 3, and neither has an incentive to deviate from their chosen strategy.

-(Betray, Betray): If Mary decides to betray her husband by murdering him, the best response for her husband is also to betray her by leaving. In this case, they both receive a payoff of 1, and neither has an incentive to unilaterally change their strategy.

Both (Cooperate, Cooperate) and (Betray, Betray) represent Nash equilibria because no player can improve their payoff by changing their strategy while the other player's strategy remains the same.

Nash equilibrium represents a stable outcome where neither player has an incentive to unilaterally deviate, but it may not necessarily correspond to the most desirable outcome. In *Lamb to the Slaughter*, the story takes an unexpected turn, and Mary's actions lead to a different outcome than the Nash equilibria in the payoff matrix. However, analysing the potential Nash equilibria helps us understand the strategic dynamics and the decision-making of the characters in the story. It sheds light to the complex human behaviour.

Hypothetical scenarios

"The field is called 'game theory' because its focus is often limited to hypothetical situations or models and games where the interaction between participants can be analysed easily and general reasons for participants' decisions can be determined" (Simley 2023). Hypothetical scenarios based on game theory principles that could apply to *Lamb to the Slaughter*:

Iterated Game: In game theory, an iterated game involves multiple rounds of interaction between players. We can imagine a scenario where Mary and her husband Patrick engage in an iterated

game, where each round represents a new opportunity for strategic decision-making. For example, after Patrick reveals his intention to leave, they could enter into a series of negotiations or attempts to reconcile their differences. Each round presents an opportunity for cooperation or betrayal, with the payoffs adjusted accordingly. This scenario would explore the potential for repeated interactions and how the strategic choices of the characters evolve over time.

Multiple Players: While the original story focuses primarily on Mary and her husband Patrick, we can introduce additional characters to create a multi-player game. For instance, we could introduce a detective or a close friend who suspects foul play. This new player would have their own objectives and strategies, leading to a more complex strategic interaction. The actions of Mary, Patrick, and the new character could be intertwined, and each player would need to consider the intentions and decisions of others to achieve their desired outcome. This scenario would examine how the strategic landscape changes with the presence of multiple players, introducing new dynamics and potential alliances or conflicts.These hypothetical scenarios allow for further exploration of strategic interactions, decision-making, and the consequences of choices in *Lamb to the Slaughter*. By applying game theory concepts, we can analyse the potential strategies, payoffs, and dynamics of the characters' interactions in different contexts.

Game theory has helped in a way to simplify the twisted and complex character motives especially of Mary Maloney when placed in a context of game. *Lamb to the Slaughter* itself opens to multiple interpretations and when employing game theory concepts these situations are systematically studied revealing the nature of these complex behaviours.

Chapter 5

Conclusion: Deciphering Human Behaviour within the Game of Life

Game theory being applied to literature gives new thoughts to certain human nature and social interactions. Even though, a branch of mathematics and economics, game theory has found its application in diverse fields ranging from psychology and political science to biology and computer science. Literature is a less explored and intriguing domain where game theory's concepts and principles have gained traction. Incorporating game theory into literary analysis provides a unique perspective that can unveil hidden layers of meaning, motivations, and interactions between characters and plot elements. Game theory is the study of decision-making and strategic interactions among 'players' of the 'game'. These players, whether they are individuals, organisations, or even fictional characters, are driven by preferences, objectives, and expectations of how other people behave. Just as players in games choose strategies to maximise their own gains, characters in literature often make choices to further their individual objectives. These choices made by characters' when analysed through the lens of game theory can give insights into their values, psychology and moral dilemmas.

One of the major works in this field is the *Theory of Games and Economic Behavior* by Neumann and Morgenstern in 1944, which expanded the study of game theory into social sciences. Later many theorists contributed various concepts to the field. Even though its studies are rooted in situations of conflict, this theory has contributed to behavioural studies as well.

The project analysed game theory in the film *Gone Girl* and the short story *Lamb to the Slaughter.* The players strategically overpowering each other in a game scenario are Amy and Nick Dunne of *Gone Girl* and Mary and Patrick Maloney of *Lamb to the Slaughter.* The second

chapter described the basic concepts of game theory in a non-mathematical way which is employed in the further chapters to the film and story. The concepts used in the project are information asymmetry, strategic interactions, payoff matrices, prisoners' dilemma, Nash equilibrium, deception and trust, tit-for-tat strategy, cat and mouse play, dynamic decision tree, and hypothetical scenarios to further the analysis.

The characters of both the texts used for the analysis suffer certain psychological dilemmas and conflicts. In both works, the women are the major characters and could be termed as heroes of the works. Men fall as antagonists. These works can also be seen as women against society. Every human being falls under certain societal pressures and women suffer the most from these pressures in a patriarchal society. The pressure imposed on them results in certain behavioural patterns and psychological conflicts. In fact, these patterns and conflicts are universal and could be equated to any literary works or real-life stories. Amy Eliot Dunne and Mary Maloney can be taken as stereotypes of certain female characters in society. These women can be protagonists as well as antagonists. It is our perceptions which define them. Amy suffers to fit into the perfect blonde sweetheart of America and Mary suffers to fit into the perfect housewife. They both are rejecting their true instincts and need to fit into society's pictures of them.

Amy's life and character have been looted from her and written upon by her mother in a book titled 'Amazing Amy' and throughout her life, she is living up to that expectation. Her already triggered life is further increased by Nick after their marriage. She is misplaced from her home town which she believes to be perfect for her. Amy herself has created the perfect life for her according to society's perceptions. When she finds out about Nick's affair, the game begins. She meticulously plans strategies to win in the game. Information asymmetry of game theory is

the major gain for Amy's winning over Nick. Even though Nick tries to gain this, he loses as Amy is a bit ahead of him. The conflict between Amy and Nick is clear in case of prisoners' dilemma and in the film's climax, they finally reached Nash equilibrium only by betraying each other. Both of them cannot be truly happy. All they do is adhering themselves to society's perceptions of them. Tit-for-tat strategy, cat and mouse play, the Bayesian game, and the decision tree further explains the strategies they employ to outmanoeuvre each other. *Gone Girl* in the lens of game theory explains the complex nature of Amy to a next level and her mind-blowing tactics to regain the power in their married life. In the same way, game theory can be equated to any real-life crimes or situations.

Mary Maloney can be seen as a subject to the patriarchal society. Even though *Lamb to the Slaughter* is a very short story, it talks extensively. The same basic concepts of game theory are employed in the story just as in the movie. In a patriarchal society, men do not care much about the women in their own houses, whereas women are expected to do everything which concerns men. When looking in a game's theoretical eyes, information asymmetry falls naturally onto women in such a situation and in *Lamb to the Slaughter* Mary Maloney gains this upper hand being Patrick's housewife. All her life revolves around Patrick whereas Patrick has a life all for himself being a detective. He holds the upper hand in a patriarchal society, but Mary holds all the information. But she lacked the information about the marriage coming to an end. The game really begins after Patrick's murder. The game situation is more intrinsic between Mary and the investigation officers. Here also Mary has the upper hand of information asymmetry as she knows who the culprit is. The story moves further through the concept of strategic interaction and Mary wins the game employing this. Mary's most crucial strategic move is the cooking of the murder weapon and feeding it to the investigation officers. The whole story can be seen as a

sequential game. The prisoner's dilemma is clear in the case of Patrick and Mary but they end up betraying each other and the worst kind of Nash equilibrium is obtained. The hypothetical scenarios of game theory concepts further explore strategic interactions and decision-making within the story. Game theory explains Mary's strategic way to win the game over the other players, Patrick and the investigation officers.

Narrative conflicts with literature can be examined as strategic interactions resembling classic game scenarios. These conflicts involve cooperation versus betrayal, competition for limited resources, or even coordination problems. By analysing both these texts in the lens of game theory, a wider understanding of the characters' psyche and motives is gained as well as a better understanding of the underlying tensions and potential resolutions within the story. These concepts if equated to any real-life situation as well as crimes, give answers to the complex human nature as well as answers to crimes. Exploring literature through a game theoretical perspective enhances reader engagement by encouraging critical thinking about characters' motives and narrative development.

There are a lot more theories and concepts in game theory. The project only gives some of the most basic concepts of game theory. Literary works like films, stories and novels could be widely analysed using game theory and its extensive concepts. This paper has its space limitations of being a PG project and the mathematical framework of game theory is much vast and interesting when applied in a literary context. The scope for further studies is limitless as human behaviours are constantly changing generation after generation. The complex nature of human beings is studied in various fields ranging from anthropology, economics, psychology and political science. Game theory is a comparatively new field and it's growing to all kinds of disciplines and literature opens a vast space for the growth of this theory.

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