BANA 277 - Customer & Social Analytics

Group Project Report:

GAME OF THRONES

SOCIAL NETWORK ANALYSIS

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1.   Introduction

The "Game of Thrones" series, based on George R.R. Martin's "A Song of Ice and Fire" (*hereinafter mentioned as "Game of Thrones" or GoT*), is famous for the complexity of its characters as well as its intricate political and social networks. This report aims to analyze the social dynamics within the book series through a network analysis of character interactions, offering insights into the story's structure and importance of characters. By analyzing how characters are interconnected, we aim to find underlying patterns and relationships that contribute to the series' massive commercial success.

1.1.   Game of Thrones Background

The "Game of Thrones," adapted from the "A Song of Ice and Fire" novels, is a fantasy drama that shows the power struggles among noble families who want to claim the Iron Throne of the Seven Kingdoms. The story takes place on the fictional continents of Westeros and Essos. Both the book and the TV series are famous for their complex characters, vivid worlds and unexpected plot twists.

A complicated political landscape shapes King's Landing, as different families plot for power and a claim to the Iron Throne. At the same time, as if supermassive dragons were not threatening enough, the GoT world includes supernatural dangers from beyond the Wall, which are a constant threat throughout the story. Through the complex relationships between families and overall social groups, at its core "Game of Thrones" is a rich tale of friends and enemies (and sometimes both) across the Seven Kingdoms.

1.2.   Purpose

The purpose of this report is to uncover and analyze the "social complexities" of the series through Social Network Analysis (SNA), which is a tool that is often used in sociology to understand relationships and interactions within a network. By applying social network analysis to "Game of Thrones," we aim to quantify and visualize the relationships between characters and explore how these relationships develop throughout the series and more specifically from books one through five. This analysis aims to shed light on character importance and story progression and also attempt to identify patterns that might explain the story's depth and the show's huge success. Furthermore, this analysis aims to demonstrate how character inter-connectivity can affect the audience's or fan's engagement and the overall success of storytelling.

2.   Data / Methodology

This section looks at the dataset and methodological approach employed to conduct a network analysis of character interactions in the fantasy world of the "Game of Thrones", as the latter is crucial in uncovering the intricacies of the story's social dynamics.

2.1.   Data

The primary source of data is a comprehensive collection of chapters from all published books in the series, which were designed to record each instance of character interaction. We came across a very rich dataset on GitHub with character interaction networks, which contain all the main and supporting characters across the "A Song of Ice and Fire" book series and focuses on their interactions throughout the books.

The authors behind the datasets, created these networks by connecting two characters whenever their nicknames or actual names appeared within fifteen words of one another (referred to as "co-occurrence") in books one through five within the 'ASOIAF' series, with the weight of the edges corresponding to the amount of interactions.

2.2.   Methodology

In our attempt to analyze the character dynamics within the "Game of Thrones" series, our methodology was carefully designed to capture the intricacies of the social interactions that George R.R. Martin portrays so richly in the "A Song of Ice and Fire" saga. We employed network analysis tools to calculate centrality measures for each character, including degree centrality i.e. the number of ties a character has, closeness centrality i.e. how close a character is to all other characters, betweenness centrality i.e. how often a character lies on the shortest path between two others and eigenvector centrality i.e. the extent to which a character is connected to other well-connected characters. This approach allowed us to quantify and visualize the series' social networks, and thereby highlight the most "influential" characters.

With the application of network analysis tools, our methodology allowed us to quantify and visually represent the intricate social landscape of the "Game of Thrones." By analyzing these centrality measures, we aimed to understand and uncover the foundations of the story, more specifically the characters (nodes) that bind the storyline and drive the plot and to understand how these relationships evolve and intertwine to form the series' complex world.

3. Social Network Analysis - Game of Thrones Overview

This section contains an analysis of the social structures within "Game of Thrones" through the application of Social Network Analysis (SNA). The methodology we employed allowed us to turn the complexity of interpersonal dynamics into quantifiable metrics, providing a comprehensive view of the series' complex narrative network. More specifically, SNA helps us see who is connected to whom, how closely they are linked, and how important they are in the story.

3.1. Network Overview

Our analysis begins with an expansive view of the network, identifying each character as a point within a larger web of connections. The first graph displays a network map, which is a visual representation of the relationships that form the social structure of the series, showing the vast network of affiliations among characters.
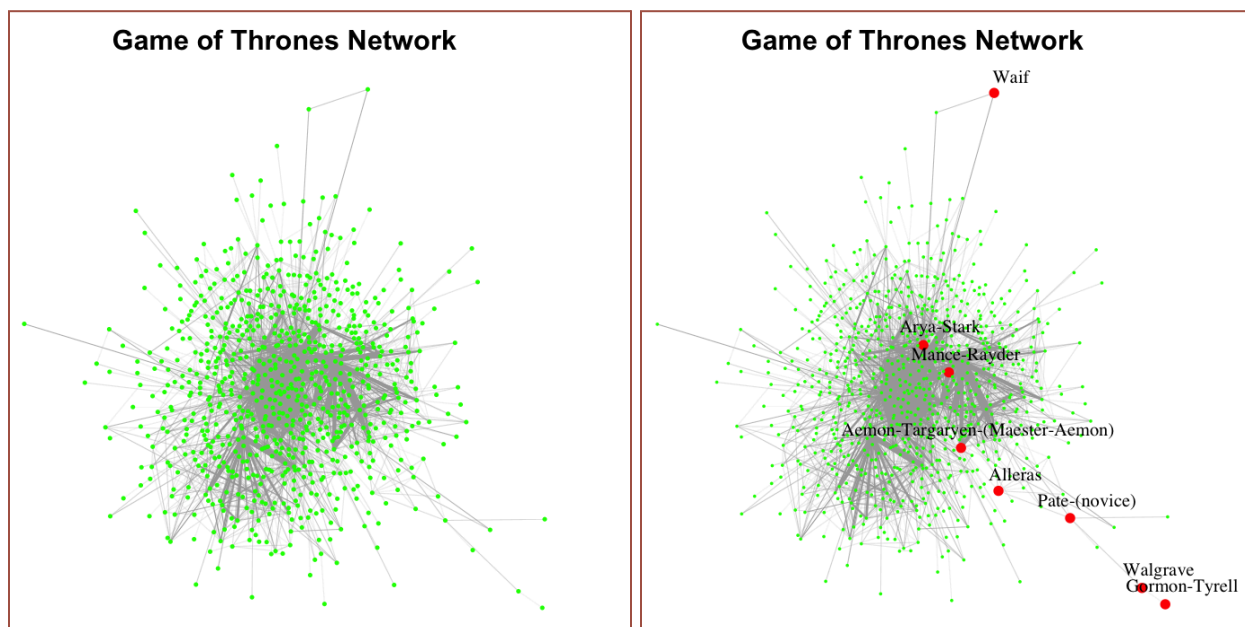
3.2. Network Diameter

As displayed in the second graph, the network diameter (a successor of the network overview including the major nodes i.e. characters) offers insight into the reach of character relationships across the series. A larger diameter suggests that some characters are quite distant from others in their social ties, which indicates a scattered social landscape in the storyline. Conversely, a smaller diameter indicates a closer web of relationships, which suggests frequent and close interactions among the central characters.

3.3.   Degree Distribution

We then look at the degree distribution, which counts the number of connections each character has. The distribution shows that while many characters have only a few connections, a select few characters have several connections, thereby being crucial hubs of interaction throughout the story.
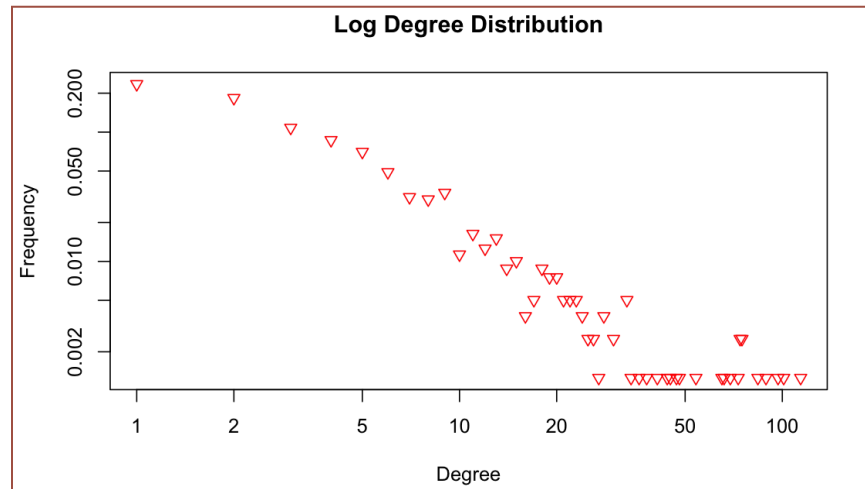
3.4.   Centrality Measures

Lastly, we looked at centrality measures, which tell us how important a character is based on their connections. Degree centrality counts the number of direct connections a character has, similar to the number of friends one might have in a social circle. Characters with high degree centrality are usually central to the plot's major events and have a huge influence in the storyline due to their numerous interactions. Closeness centrality, measures the degree to which a character is ne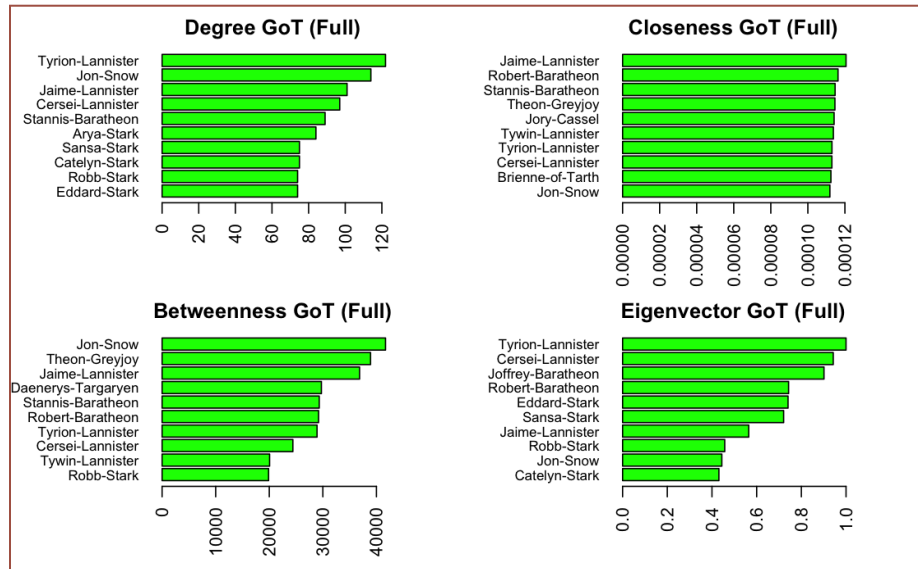ar all other characters within the story, thereby measuring their potential to influence or be influenced by the unfolding events at a quick pace. Characters who have high closeness centrality can be seen as important "players" in the series.

Furthermore, betweenness centrality refers to characters who often act as "brokers" or "bridges" in the social structure of the story and are essential for the flow of information and interactions between other characters. These are the individuals who find themselves at the center of the series' most important developments. Lastly, eigenvector centrality offers an insight into a character's influence that extends beyond their immediate connections, considering the significance of the characters to whom they are connected. Eigenvector identifies important figures in the story, whose influence is increased by the status and power of their allies and close friends. These centrality measures form a comprehensive framework through which we can analyze and acknowledge the subtle, yet powerful forces that drive the complex social interactions in GoT.

Degree GoT (Full)

Tyrion-Lannister
Jon-Snow
Jaime-Lannister
Cersei-Lannister
Stannis-Baratheon
Arya-Stark
Sansa-Stark
Catelyn-Stark
Robb-Stark
Eddard-Stark

0 20 40 60 80 100 120

Closeness GoT (Full)

Jaime-Lannister
Robert-Baratheon
Stannis-Baratheon
Theon-Greyjoy
Jory-Cassel
Tywin-Lannister
Tyrion-Lannister
Cersei-Lannister
Brienne-of-Tarth
Jon-Snow

0.00000 0.00002 0.00004 0.00006 0.00008 0.00010 0.00012

Betweenness GoT (Full)

Jon-Snow
Theon-Greyjoy
Jaime-Lannister
Daenerys-Targaryen
Stannis-Baratheon
Robert-Baratheon
Tyrion-Lannister
Cersei-Lannister
Tywin-Lannister
Robb-Stark

0 10000 20000 30000 40000

Eigenvector GoT (Full)

Tyrion-Lannister
Cersei-Lannister
Joffrey-Baratheon
Robert-Baratheon
Eddard-Stark
Sansa-Stark
Jaime-Lannister
Robb-Stark
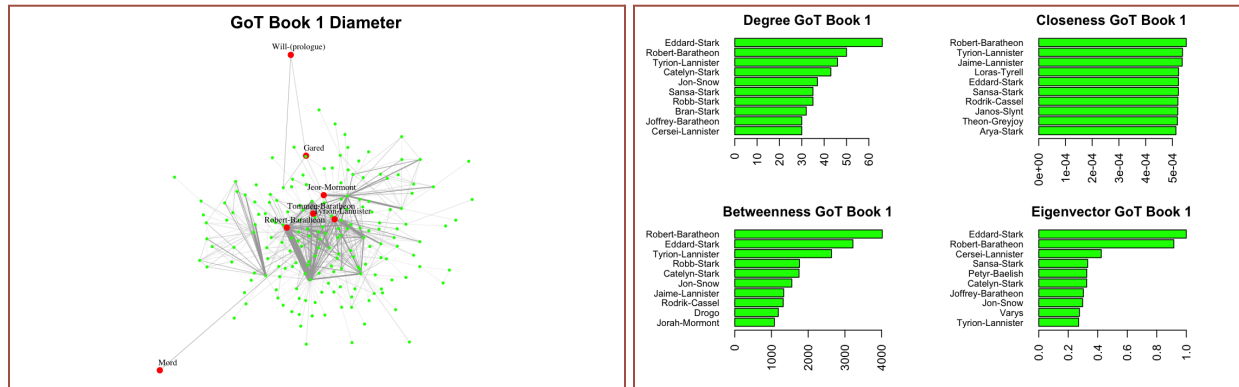Jon-Snow
Catelyn-Stark

0.0 0.2 0.4 0.6 0.8 1.0

4.   Books 1 and 2 Analysis

In this section, we look at the centrality within GoT, analyzing the development of individual characters, their roles as bridges within the network and the broader implications of these findings for the first two books of the series.

4.1.   Book 1: A Game of Thrones

In "Game of Thrones", we see the rise of key players whose decisions and relationships form the foundation for the series' complex social network. Here, we assess the centrality of characters like Eddard Stark and Robert Baratheon, who have significant influence in the network through their interactions and political maneuvers. We follow the development of Eddard Stark's character, whose high degree centrality and subsequent dramatic fall following his execution highlight the fragility and short-lived nature of power in the story. The book also introduces us to characters who serve as bridges, i.e. vital connectors that link unconnected groups and facilitate the flow of the story. These figures are often positioned at crucial points within the network, impacting the storyline's progression through their unique placement.

GoT Book 1 Diameter

Degree GoT Book 1

Closeness GoT Book 1

Betweenness GoT Book 1

Eigenvector GoT Book 1

4.2. Book 2: A Clash of Kings

"A Clash of Kings" introduces new factions and power players that diversify and complicate the network. This book's analysis focuses on Tyrion Lannister, whose political acumen and strategic positioning in King's Landing increase his centrality measures. We see how his actions as Hand of the King establish him as a bridge during a time of growing conflict. The network's evolution reflects how fragmented the storyline is as characters spread across different geographical locations, resulting in a change in the network's overall structure and the roles of individual characters. The implications of these shifts are significant, affecting both the network's internal balance and the audience's perception of character importance and the story's direction.

GoT Book 2 Diameter

Degree GoT Book 2

Closeness GoT Book 2

Betweenness GoT Book 2

Eigenvector GoT Book 2
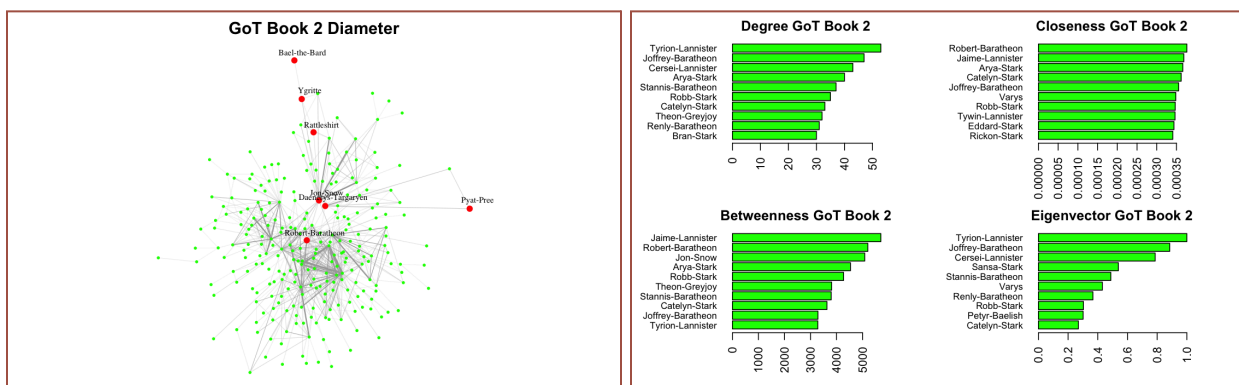
5.   Books 3, 4 and 5 Analysis

This section explores the evolving storyline and social network of GoT through Books 3, 4, and 5. The focus is on how centrality measures of key characters evolve, the emergence and role of new bridges in the story, and the implications that they have on the developing story.
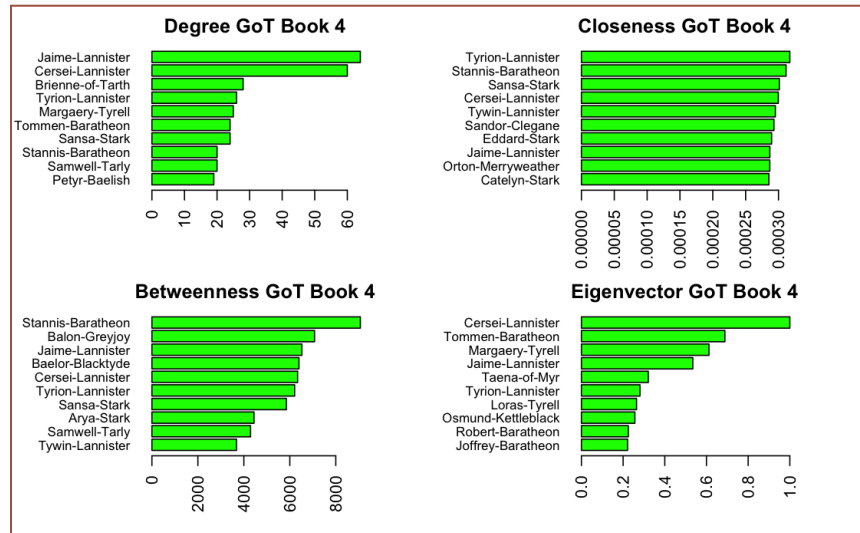
5.1.   Book 3: A Storm of Swords

"A Storm of Swords" marks an eventful period in the book series, due to important plot twists and the infamous "Red Wedding", a pivotal moment in the series where several key characters meet their demise. This book's analysis highlights the dramatic shifts in character centrality, particularly for Robb Stark and Catelyn Stark, whose roles as central figures are abruptly cut short. Their centrality before the Red Wedding highlights their importance to the story and the impact of their loss on the network. New bridges emerge as the story develops, with characters like Jon Snow and Daenerys Targaryen becoming more important as they link previously unconnected storylines. This book reorders the social landscape notably, affecting alliances, enemies and the overall direction.
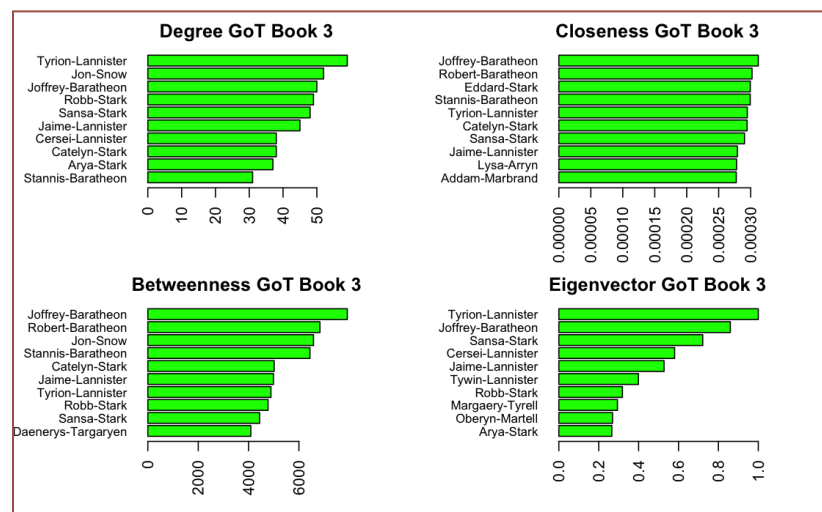
5.2.   Book 4: A Feast for Crows

In "A Feast for Crows," the story deviates even further, exploring the consequences of the "War of the Five Kings" and introducing new locations and characters. The analysis of this book focuses on characters such as Cersei Lannister and Brienne of Tarth, who take on more central roles in the absence of others. Their growing centrality measures reflect the story's changing focus, highlighting the importance of their individual journeys and decisions. This book also looks at the role of bridges in connecting the increasingly fragmented storyline, focusing on the characters who begin to link the story's expanding geographical and political scope.

Degree GoT Book 4 — Jaime-Lannister, Cersei-Lannister, Brienne-of-Tarth, Tyrion-Lannister, Margaery-Tyrell, Tommen-Baratheon, Sansa-Stark, Stannis-Baratheon, Samwell-Tarly, Petyr-Baelish

Closeness GoT Book 4 — Tyrion-Lannister, Stannis-Baratheon, Sansa-Stark, Cersei-Lannister, Tywin-Lannister, Sandor-Clegane, Eddard-Stark, Jaime-Lannister, Orton-Merryweather, Catelyn-Stark

Betweenness GoT Book 4 — Stannis-Baratheon, Balon-Greyjoy, Jaime-Lannister, Baelor-Blacktyde, Cersei-Lannister, Tyrion-Lannister, Sansa-Stark, Arya-Stark, Samwell-Tarly, Tywin-Lannister

Eigenvector GoT Book 4 — Cersei-Lannister, Tommen-Baratheon, Margaery-Tyrell, Jaime-Lannister, Taena-of-Myr, Tyrion-Lannister, Loras-Tyrell, Osmund-Kettleblack, Robert-Baratheon, Joffrey-Baratheon

5.3.   Book 5: A Dance with Dragons

"A Dance with Dragons", the series's final book, re-integrates and progresses parallel storylines, with a significant focus on characters in the North and across the Narrow Sea. This section analyzes the rise in centrality of characters like Jon Snow and Tyrion Lannister, who navigate their respective complex political environments and also act as crucial connectors across the story's broad expanse. The emergence of new and influential bridges in the story, such as Daenerys Targaryen, who connects various cultures and factions, is of key importance. The implications of these characters' actions and developments are vast, setting the stage for future conflicts and alliances, while also reshaping the story's social and political landscape.

Degree GoT Book 5 — Jon-Snow, Daenerys-Targaryen, Stannis-Baratheon, Tyrion-Lannister, Theon-Greyjoy, Cersei-Lannister, Barristan-Selmy, Hizdahr-zo-Loraq, Asha-Greyjoy, Melisandre

Closeness GoT Book 5 — Stannis-Baratheon, Robert-Baratheon, Tywin-Lannister, Tyrion-Lannister, Cersei-Lannister, Daenerys-Targaryen, Asha-Greyjoy, Myrcella-Baratheon, Axell-Florent, Doran-Martell

Betweenness GoT Book 5 — Stannis-Baratheon, Daenerys-Targaryen, Jon-Snow, Robert-Baratheon, Asha-Greyjoy, Tyrion-Lannister, Cersei-Lannister, Godry-Farring, Tywin-Lannister, Barristan-Selmy

Eigenvector GoT Book 5 — Daenerys-Targaryen, Hizdahr-zo-Loraq, Barristan-Selmy, Quentyn-Martell, Daario-Naharis, Skahaz-mo-Kandaq, Missandei, Gerris-Drinkwater, Tyrion-Lannister, Irri

6.   All Character Centrality Evolutions

This section explores the development of centrality measures for GoT characters in providing a holistic view of their shifting roles and influences within the series' complex social network.

6.1.   Degree Centrality and Its Evolution

Degree centrality, a measure of the number of connections a character has, provides insight into their level of social activity and prominence within the narrative. The plot of degree centrality across the series illustrates these connections. Eddard Stark, for instance, has a high degree centrality in Book 1, symbolizing his major role in the unfolding events. Despite his execution, he still registers degrees in subsequent books, which can be attributed to his continued mention and influence on the story, affirming the lasting impact of his character's actions and legacy.
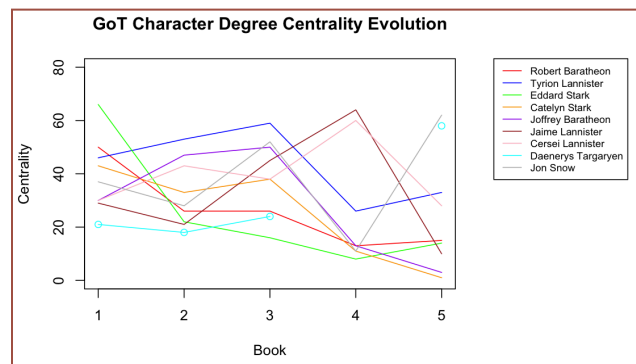

6.2.   Closeness Centrality and Story Expansion

Closeness centrality measures how close a character is to all others in the network, offering an indication of their influence over or accessibility to the unfolding events. Observing the closeness centrality, a downward trend is apparent for most characters. This trend suggests an expansion of the story world and increasingly fragmented storylines, as characters venture into new territories and form separate narratives, hence becoming less central within the original network.
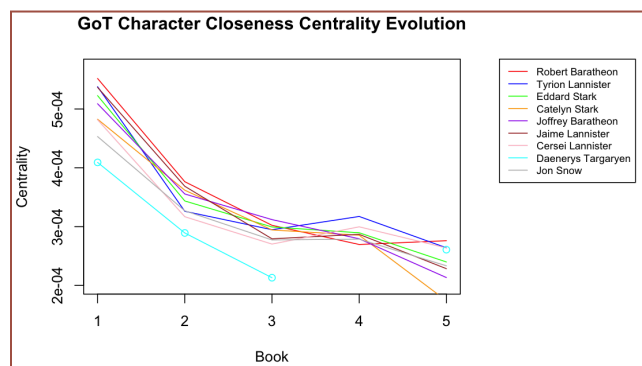
6.3.   Betweenness Centrality and Key Events

Betweenness centrality identifies characters that act as bridges within the network, often playing a crucial role in the storyline's progression. For example, Catelyn Stark exhibits high betweenness in Book 3, right before her death, highlighting her role in pivotal events leading up to the Red Wedding. Daenerys Targaryen's betweenness grows between Books 3 and 5, peaking in Book 5, reflecting her increasing significance as she forges new alliances, preparing for her role as a potential ruler.
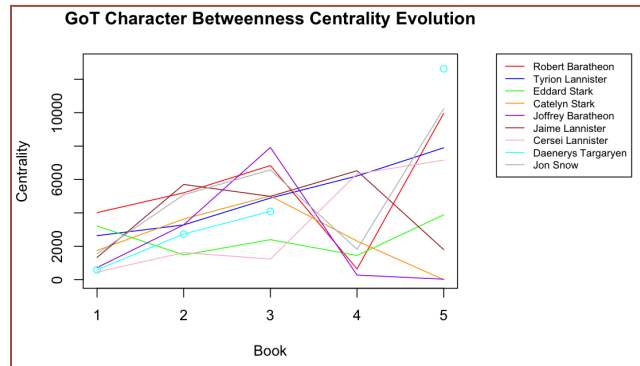
6.4.   Eigenvector Centrality and Influence

Eigenvector centrality indicates not just the quantity of a character's connections but also their quality, by associating them with other influential characters. The Lannisters, Baratheons, and Starks dominate the eigenvector centrality, which aligns with the narrative as these families are central to the series' power dynamics. Tyrion Lannister, consistently having the highest eigenvector centrality, emphasizes his importance as a linchpin character. His interactions with many significant characters throughout the series suggest his considerable influence over the series' political and social outcomes.
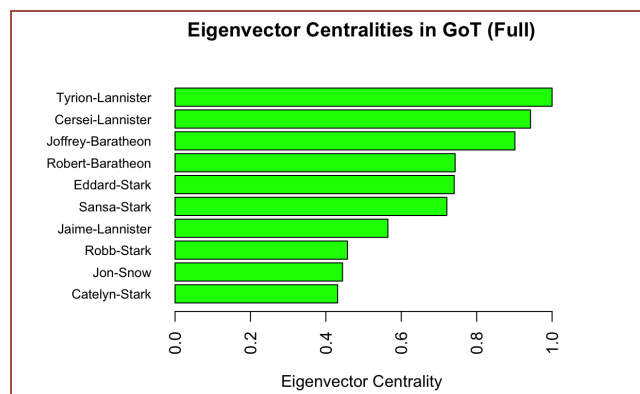
7.   Major Characters and their Roles in the Network

In this section, we look into the roles of major characters within the "Game of Thrones" social network, focusing on the Lannister siblings — Jaime, Tyrion, and Cersei — as well as Jon Snow. These characters' interactions and positions within the network not only define their individual arcs, but also significantly influence the series' overarching narrative.

7.1.   Jaime Lannister (The Connector)

From his origins as the notorious Kingslayer to a figure of more complex morality, Jaime Lannister serves as a nexus within the story, a role highlighted by his high closeness and betweenness centrality. These metrics attest to his position as 'The Connector' in the narrative, able to link together various story threads and characters through his evolving relationships, particularly with Brienne of Tarth. His journey not only signifies his own character development but also his changing narrative weight.

7.2.   Tyrion Lannister (The Influencer)

Tyrion Lannister's role as 'The Influencer' is justified by his high degree and eigenvector centrality, placing him at the core of the political plotting within the series. His sharp intellect and diplomacy highlight his key role in navigating the complex social hierarchy of Westeros. Tyrion's centrality across the network accentuates his character as a major driver of the plot, influencing events both within the capital of King's Landing and in his later adventures across the continent.

7.3.   Cersei Lannister (The Power Broker)

Cersei Lannister, denoted as 'The Power Broker,' is characterized by her high eigenvector centrality. This indicates her significant influence exerted through strategic, often ruthless, interactions with other power players within the series. Her centrality encapsulates her ambition and her drive to maintain control over the Iron Throne, shaping much of the political landscape of the series through her alliances and conflicts.

7.4.   Jon Snow (The Bridge)

Jon Snow is aptly described as 'The Bridge,' with his notable betweenness and degree centrality demonstrating his role in uniting various narrative arcs. His centrality reflects his character's evolution from the illegitimate Stark son to a leader who spans the chasm between different cultures and factions in the series, notably the Night's Watch and the wildlings. Jon Snow's journey is integral to the series, binding the story's northern narrative with the larger plotlines.

8.   Conclusion and Future Research

In the final section, we conclude our findings from the GoT network analysis, highlighting the crucial roles and interactions of characters as they steer the story's complex social structure. We also discuss future research avenues, made possible with the potential inclusion of new data from sequels, as well as comparative studies between the books and their television adaptation.

8.1.   Conclusion

Choosing "Game of Thrones" as our topic and studying it through Social Network Analysis (SNA), has revealed dynamic character networks that reflect the series' complex storyline. By using centrality measures, this report has given insight into the pivotal roles that certain characters play and the significant events that shape the story's progression. These characters, identified by their high centrality measures, are crucial in understanding the flow of the narrative and the interrelations that drive the plot forward.

Despite the insights gained, this report acknowledges certain limitations. The network considered is undirected, which does not account for the directionality of relationships (e.g., who influences whom), potentially oversimplifying complex character dynamics. Additionally, the definition of "co-occurrence" used to establish connections between characters, may not fully summarize the depth of their interactions.

8.2.   Future Research

Looking ahead, there are several directions for further research. A comparative analysis between the character networks of the "A Song of Ice and Fire" book series and the "Game of Thrones" HBO adaptation would offer an interesting study in how different mediums can alter character centrality and the network structure. Moreover, with "The Winds of Winter," the forthcoming sixth book in the ASOIAF series which is still under development, future research will have the opportunity to incorporate the evolving narrative and any new characters or alliances that emerge.

Future studies might also consider a directed network approach to better capture the complexities of influence and hierarchy within the story. Additionally, employing a more nuanced definition of interaction, possibly accounting for the strength and nature of relationships, could produce a more refined analysis. With these considerations in mind, the foundation laid by this research provides a solid basis for continued exploration into the social structures of fictional narratives and how they resonate with audiences, contributing to the enduring popularity and impact of series like "Game of Thrones".