THE GAME OF *GAME OF THRONES:*

Networked Concordances and Fractal Dramaturgy

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In their 2009 anthology *Third Person: Authoring and Exploring Vast Narratives,*

editors Pat Harrington and Noah Wardruip-Fruin discuss the explosive popularity of

"vast narratives"; sweeping stories which combine multiple central characters and

persistent, intertwining plot lines in a continuous cross-media narrative universe. Made

widely accessible by the Digital Age, these sprawling story worlds include massively

multiplayer online games, comic book superhero "universes" composed of multiple films

as well as print and web content, role-playing games like *Dungeons & Dragons,* and

grand television serials with expansive and intermingling storylines. Vast narratives are

affected by a number of forces that challenge traditional aesthetic criticism, including

collaborative authorship, sprawling and polymorphous plotlines, real-time fan feedback,

proliferation of official and unofficial associated materials available through TV and the

web, and the economic exigencies of digital media production, all of which are fiendishly difficult to render legible enough to include in a close reading.[1]

It is productive to see a vast narrative like HBO's *Game of Thrones* as part of what Marco Ruffino and Paola Brembilla have termed a *narrative ecosystem,* in that it affects and is affected by millions of individuals, and its impact on a social scale raises questions that can be addressed by critical methods such as big data analytics.[2] But traditional mathematical discourse is ill-equipped to grapple with those nuances of cultural production that cannot be easily represented by quantitative data, including tracking what inspires or moves an audience, the impact of politics and identity on a developing story, and other important sites of discourse. Critical engagement with complex serials, then, raises questions that require a synthetic approach to data gathering and analysis that unites cultural criticism with mathematical analysis. In this essay, we hope to provide one model of collaboration that combines big data analytics with aesthetic criticism while wrestling with the rapidly-unfolding plot of *Game of Thrones.* We use social network analysis and data visualization to construct a two-paneled Networked Concordance for seasons of *Game of Thrones*, consisting of Character Interaction Networks (CINs) and Character Centrality Diagrams (CCDs). We then evaluate the results within conventions of dramatic storytelling. In so doing, we

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[1] Harrington, Pat and Noah Wardrip-Fruin, eds. "Introduction," *Third Person: Authoring and Exploring Vast Narratives* (Boston: MIT 2009), 1-9.

[2] Ruffino, Marco and Paola Brembilla, "Narrative Ecosystems Through the Network Analysis Lens," *International Journal of TV Serial Narratives,* 1:2, Winter 2015: 55-68. Ruffino and Brembilla suggest that vast narratives might be put into productive interpretive frameworks if they are understood within a socioeconomic environment as a biologist might understand a species in a natural environment, competing for resources and coping with stressors that affect its shape and behavior over time. Their analytical tool accounts for factors ranging from salaries of creatives to the cost of putting gas in delivery vehicles to the celebrity draw of the actors to the long term strategies of the producers without neglecting the response of fans (58). The latter force is particularly important for serialized television, since a show's popularity is the primary predictor of its market value.

suggest a new form of dramaturgy which discovers key insights into the themes of *The Game of Thrones* that are not obvious to traditional analysis.

The complex serial TV series *Game of Thrones* is an ideal test subject for this kind of analysis. We cannot focus on one or two "main characters" while also achieving a holistic understanding of the work, yet traditional analysis of a myriad ensemble of characters, and their various combinations and recombinations, becomes infeasible due to the sheer mathematics of it all. To navigate out of this methodological dead end, we require analytical techniques and modes of communication that scale with the size of the narrative. We believe that the burgeoning field of data science, and in particular, network science and data visualization, provide a flexible way to engage with sprawling super-narratives. These methods empower us to cope with stories of immense proportions by visualizing them as fractals composed of smaller stories that mimic and therefore describe the larger ones. Fractal stories are scale-free, in the sense that there is not a single correct and characteristic scale from which to view them. We use data visualization to make our analysis instantly legible at multiple scales, matching the fractal nature of the source material in kind. In short, we attack scale-free narratives with scale-free methodologies.[3]

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[3] We do not aspire to any definitive "predictive analytics," by which we mean the popular fan pastime of trying to imagine which beloved character in the series will die next. Likewise, writing as we are in the summer of 2017, at the beginning of the release of Season Seven, by the time this collected volume appears in print, many long-awaited secrets will have been revealed. To quote Tyrion: "Prophecy is like a half-trained mule. It looks as though it might be useful, but the moment you trust in it, it kicks you in the head." (Martin, George R.R. *A Dance With Dragons* (New York: Bantam, 2011) p. 534). We are also obliged to point out that we have dealt only with problems within the narrative and in so doing, although we deal in some ways with the sexism portrayed in *Game of Thrones,* we do not comment on issues of race, class, and violence that other critics have rightly engaged. We do not mean to suggest that these problems do not exist, only that they require a different kind of analysis to properly confront.

The synthesis of mathematical and aesthetic research is by no means obvious.[4] At the outset, the disciplines appear almost antithetical. Mathematics strives for simplicity, even to the point of eliminating real-world evidence in favor of more elegant theorems that can be proven absolutely. Culture, on the other hand, tends to be messy, and critics need to be flexible and responsive to social changes that might affect the way a cultural product is conceived or received. Mathematicians lament that math is often loathed, even by those who recognize its importance to modern life; Cultural scholars lament that few people understand how important culture is to modern life, even by those who love it the most. Few mathematicians appreciate the rigorous methods cultural scholars apply to their work, and few cultural scholars appreciate the aesthetic factors mathematicians consider when they approach their work and render it legible. The emergence of vast narratives, such as *Game of Thrones,* and the innovations of big data analytics offer an interesting new site where these polarized disciplines may collaborate towards a greater understanding of how cultural products develop and operate, and how they reflect the societies that generate them.

Character Interaction Networks and Centrality Measures

In 2016, Beveridge and Shan published a social network for *A Storm of Swords*, the third novel in George R. R. Martin's *A Song of Ice and Fire* saga.[5] Originally

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[4] Like many others, we aspire here to the notion of digital humanities as articulated by Robert Scholes and Clifford Wulfman in their "Humanities Computing and Digital Humanities" in *South Atlantic Review* 73:4 (Fall 2008), 50-66.

[5] Beveridge, Andrew and Jie Shan, "Network of Thrones," *Math Horizons Magazine* 23:4, (April 2016), 18:22. Since then, the authors have produced more definitive networks for all five available volumes, see https://networkofthrones.wordpress.com/.

intended as an accessible introduction to network science, the interdisciplinary study of complexity and connection, their article provided a compelling visualization, and a quantitative way to identify the main characters. To construct their network, they developed a roster of characters, then parsed the text and connected pairs of characters whenever their names (or nicknames) appeared within fifteen words of one another. The resulting Character Interaction Network (CIN) consisted of nodes (points) corresponding to characters, with pairs joined by weighted edges (links) tallying the total number of encounters between them.[6]

Their CIN shows two hallmarks of complex networks. First, the network features a confederation of dense subnetworks tied together by a sparser expanse of edges. Second, the network structure reveals a subset of characters that play an outsized role in the local and global connectivity of the network. Just as in real life, there are multiple ways in which a character can exert power or influence within this fictional social network. For example, a character might have lots of connections, increase the cohesion of a subnetwork, or help to connect distant regions. Researchers from various fields, including mathematics, sociology, computer science, physics and economics, have developed quantities that capture different aspects of the systemic relational dynamics. These quantities, based solely on network structure (and independent of contextual information) are known collectively as centrality measures.[7]

Beveridge and Shan validated their CIN against the narrative dynamics of the novel: community detection discovered true sub-networks, and the characters deemed

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[6] This network creation process incorporates the three types of work in humanities computing: algorithmic, metalinguistic, and representational. See McCarty, W., "Humanities Computing: Essential Problems, Experimental Practice," Literary and Linguistic Computing 17:1 (2002), 103:125.

[7] For an overview, see Chapter 7 of Newman, M.E.J., *Networks: An Introduction* (Oxford: Oxford UP 2010).

important by the centrality measures were indeed the main characters. Their preliminary work opens the question as to whether network analysis techniques provide an effective tool for critical analysis of vast narratives. We take up this question in this current work.

We begin by describing how to transform quantitative network data into qualitative evidence for critical analysis of vast narratives. We introduce five centrality measures from the field of network science, offering both a general mathematical explanation and a specific interpretation for a CIN, where the edges correspond to character interactions in a complex social world. For each measure, larger centrality values indicate greater importance.

- **Degree centrality:** How many people do you know? Degree centrality is the number of other nodes (characters) directly connected via an edge (interaction).
- **Weighted degree centrality**: How many interactions have you participated in? Weighted degree centrality is the sum of the weights of the edges incident with the node.
- **Betweenness centrality:** Do you help to connect distant parts of the network? Betweenness centrality is the number of short paths connecting pairs of vertices that travel through the given node. This measure identifies nodes that are strategically positioned in the network. In our social network, the corresponding character is a broker of information or influence, who helps to connect distant storylines together. A node can have high betweenness, even if it has relatively fewer connections, especially when it sits at a bottleneck in the network.
- **Eigenvector centrality:** How many important people do you know? How much prestige does your network position bestow upon you? Eigenvector centrality is

weighted degree centrality with a feedback loop for being adjacent to important people (regardless of whether these ties are strong or weak). To wit, in any relational social network, links increase a character's importance. What's more, having links to important people boosts your clout in the network. This amplification leads to a recursive definition of importance that converges to stable values. Eigenvector centrality measures a character's prestige (potential power and influence) regardless of whether they are overtly capitalizing on those connections.

- **PageRank centrality:** How many interactions with important people do you participate in? What is your agency within the network? PageRank centrality aligns with a viewer's notion of who is a main character. Like eigenvector centrality, PageRank centrality is weighted degree centrality with a feedback loop, but PageRank's amplification incorporates the strength of the interaction. PageRank captures narrative development: the story unfolds when an important character *interacts* frequently with other important characters. Note that network agency (PageRank centrality) is different from network prestige (eigenvector centrality): a low-born, bootstrapping commoner generates agency by punching above their weight class, while a high-born, privileged royal child receives prestige while resting on their laurels.

We adapt the approach of Beveridge and Shan to generate CINs for the *Game of Thrones* TV series. We parsed fan-generated scripts for Seasons One and Five from

genius.com,[8] and Season Three scripts that we generated ourselves. In constructing our networks, we take advantage of the declarative organization of these teleplays. We link two characters every time that they have interacted in one of the following five ways:

- The characters appear in a scene together.

- The two characters are mentioned together in a stage direction.

- The characters exchange lines of dialogue. Each transition between speakers creates a link, so a longer exchange results in a stronger connection.

- One character speaks about another character.

- The two characters are spoken of together by a third character.

By design, the three dialog interactions dominate co-appearance and stage direction. We are wary of giving undue credence to the subjective, fan-authored stage directions, especially in comparison with the authentic dialog exchanges. Vitally, we note that creation of a CIN is not an exact science, and we acknowledge the impossibility of developing an authoritative ranking of characters. Instead, we focus on identifying differences between characters (as opposed to resolving close calls) and on evaluating how the distinct centrality measures offer insight into the positions, actions and motivations of the characters.

We restrict ourselves to networks for scripts from Seasons One, Three and Five, which provide an accurate sampling of the progression of the saga. We assume that the reader is familiar with the main plot points of the series, and we defer to other readily

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[8] https://genius.com/artists/Game-of-thrones

available resources for plot summaries.[9] Network visualizations for Seasons One,

Three and Five appear in Figures 1, 2 and 3, respectively.[10] Each network decomposes

into a collection of denser subnetworks, identified by an approximation technique called

the Louvain method, and the nodes are shaded by according to these communities.[11]

The networks for Seasons Three and Five split into clearly distinct communities, with

very few strong ties between them. The network for Season One is less differentiated,

indicating how close-knit the threads of the first season are compared to later

installments. Each network features some prominent triangles, which from time out of

mind have been staple engines of dramatic action.[12] Typically, these triangles contain

three strong edges (e.g., Tyrion, Sansa and Shae in Season Three, and Cersei,

Margaery and Tommen in Season Five), but sometimes the missing leg speaks to a

different kind of tension (e.g., Daenerys, Drogo and Jorah in Season One).

Like many data visualizations, our CIN figures employ a visual grammar to

communicate multiple, complementary perspectives. The node labels are sized by

PageRank while the nodes themselves are sized by betweenness. The thickness of the

surrounding edges indicate the strength of the interactions. The visualization

simultaneously communicates who, how and why a character is important. This

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[9] E.g., https://en.wikipedia.org/wiki/Game_of_Thrones#Adaptation_schedule or
http://gameofthrones.wikia.com/wiki/Category:Seasons. This chapter assumes the reader's broad
familiarity with the *Game of Thrones* television show, but even for those who are not fans, we hope that
our collaborative exercise provides a model for other experiments uniting social network analysis with
dramaturgy in the evaluation of vast narratives.

[10] These images were created with Gephi, open source software for empirical network analysis,
https://gephi.org/. The Gephi project is an example of the modular and reusable components that are
championed in McCarty, W., "Humanities Computing: Essential Problems, Experimental Practice,"
Literary and Linguistic Computing 17:1 (2002), 103:125.

[11] Blondel, V.D., J.-L. Guillaume, R. Lambiotte and E Lefebvre, "Fast unfolding of communities in large
networks", *Journal of Statistical Mechanics: Theory and Experiment, 10 (*2008), P10008.

[12] E.g., "Rhetorical Criticism: Theory of Genres" in Northrop Frye's 1957 *Anatomy of Criticism* (New
Jersey: Princeton UP, 1990) 243-337.

visualization invites and requires an active viewer to synthesize (and resynthesize) the information into an ensemble of related insights.

To that end, we reflect on betweenness, deferring our discussion of PageRank to the section devoted to Character Centrality Diagrams below. Characters with high betweenness provide global connectivity, tying the diverse narrative threads into a single story. Among the expected high-performers (e.g. Robb and Tywin in Season 3, Stannis and Cersei in Season 5), betweenness also highlights the importance of the fallen characters to the contemporary action. This impact is most pronounced in Season Three, where Robert and Ned have extremely high betweenness, in spite of having met their fates in Season One. More generally, memorials to the fallen decorate the folds between communities. The liminal dead instantiate both ties that bind communities to one another and the tensions that have torn them apart. Importantly, actual removal of these fallen characters from the CINs results in a collection of communities with few meaningful ties between them. As Littlefinger knows well, orchestrating gaps in the network creates confusion and opportunity.[13]

A conspicuous absence of centrality can also provide significant evidence. Conventions proclaim the importance of Daenerys, but her centrality scores remain middling, at best. Indeed, her performance is tempered by her remote location, and by her lack of attention from the mighty powers in Westeros. By Season Five, the beggar queen has built her own network from scratch, patiently cobbling together a motley alliance, but she is still far from reclaiming her birthright. When the Mother of Dragons

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[13] "Chaos isn't a pit. Chaos is a ladder. Many who try to climb it fail and never get to try again. The fall breaks them. And some are given a chance to climb. But they refuse. They cling to the realm, or the gods, or love. Illusions. Only the ladder is real. The climb is all there is." -- Littlefinger, Season 3, Episode 6.

returns to the Seven Kingdoms, her centralities will surely ignite as the Westerosi realize that she presents a far graver threat than anticipated.

Fractal Dramaturgy

Having built our Character Interaction Networks, it is time to ask: of what value to dramatic criticism is such accumulation of quantitative data? On its own, this big data does contain some significant and surprising evidence, defining in social networking terms some of the intrinsic structures of the show's narrative which are not evident to a conventional experience of watching the show. The analysis renders more legible the baffling complexity of the *Game of Thrones* plotlines. Because it provides *relational* data, it focuses on character interactions (a focus also important to traditional dramaturgical analysis) and categorically defines which relationships are the most important to the ongoing narrative. Crucially, each of the centrality measures use the *structure* of the interactions (in isolation of their content) to tell us what is important. The CIN also puts a high value on the liminality of certain characters as connectors between the various loci of intense interactions, drawing attention to characters that might otherwise escape our notice. But none of this data is useful to a rich analysis of the drama of *Game of Thrones* unless it is put into a broader context. Empirical network analysis doesn't necessarily draw conclusions, but it does gives us leads which we might follow up with deeper questions.

Luckily, others have ventured into this area. In his 2015 *Complex TV,* Jason Mittel proposes a "poetics" of vast television narratives.[14] Mittell draws upon a classical

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[14]Mittell, J. *Complex TV: The Poetics of Contemporary Television Storytelling* (New York: NYU Press, 2015).

definition of poetics here, which he defines elegantly as "a focus on the specific ways that texts make meaning, concerned with formal aspects of media more than issues of content or broader cultural forces" (4). Mittell's invaluable contribution is to outline a poetics for complex televisual narratives "influenced by a model of cultural circulation, in which practices of the television industry, audiences, critics, and creators all work to shape storytelling practices, and thus questions about form are not restricted to the realm of the text but deeply connected to contexts" (5). In so doing, Mittell connects classical poetics to the notion of "narrative ecosystems."

"Poetics" was a term first coined to discuss dramatic action, rather than narrative storytelling. In his 335 bce text *Poetics,* Aristotle analyzes how the structures of performed stories shape the meanings that a story produces for an audience; that is to say, the structure of a drama sets up certain expectations in the audience that must be addressed. Aristotle felt that the structural form of Tragedy magnified the deeper themes for a greater impact on the audience. Key to this magnification was Tragedy's focus on a single character whose choices dictate not only his own fate but the fate of thousands. We call this character the *protagonist.*[15] Nowadays, we often confuse the term *protagonist* with *main character* or *hero,* but this a confusion that impedes analysis. *Main character* describes a character who appears in the plot a great deal, and a *hero* is a character with laudable personal traits, but *protagonist* properly refers to the position of a character within the larger structure of a piece. In Greek, *proto* signifies "first" and an *agoniste* is "a person who is engaged in a struggle" (*agon* is the root of the English

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[15] Students of classical drama would be well served to refer to *Aristotle's Poetics: The Argument* by Gerald Frank Else (Boston: Brill, 1957) as the definitive analysis of this important text. Aristotle did not use this term himself, preferring "tragic hero," but "protagonist" appears as early as the second century bce in the works of Lucian (see his *Calumniae non temere credendum* Section 7) and has become synonymous with Aristotelian criticism.

word "agony"). In Tragedy, *agon* refers to the progression of the central plot which, when complete, reveals the author's key themes. The protagonist is the character who through suffering is compelled to act, and whose choices and actions advance that plot; the antagonist is the character who incites those changes.[16]

A conventional tragic protagonist is a morally complex character, embodying good and bad traits, and often making very bad decisions for what they believe are good reasons. Aristotle attends to the emotional impact his protagonist's arc has on the audience - it is not as compelling to see a perfectly good person fall and suffer (or a perfectly wicked person get their comeuppance) as it is to see a conflicted person trying to do what is right and suffering for that decision. In his excellent interpretation of *Poetics,* Jim Bierman writes:

> While Aristotle rejects the depiction of the downfall of an entirely virtuous person as an option in tragedy, he does support the downfall of a character whose virtue is somewhat compromised. That person's downfall comes about as a result, not of his own wickedness but "because of some mistake" (δι᾿ ἀμαρτίαν τινά). The nature and role of that mistake (hamartia / ἀμαρτία) is an essential element in Aristotle's evaluation of the tragic act itself.[17]

Bierman points out that the term *hamartia* was originally used by archers to mean "missing the mark," and so the modern translation of this term *hamartia* as "sin" or "pride," is incorrect. A protagonist misses the mark due not to some moral failing but to some particular psychological blind spot that obscures the consequences of their

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[16] It is sometimes a complex task to pin down a classical tragic protagonist: in *Oedipus,* for instance, Oedipus is both the victim of *and* the perpetrator of the play's most important crimes, and so he is both protagonist and antagonist.

[17] Bierman, James. "Character." *Classical Tragedy*. University of California Santa Cruz, n.d. Web. 10 Apr. 2017. <http://tragedy.ucsc.edu/>.

actions from them - in some cases, that blind spot has to do with the character's most laudable traits, including their sense of duty or innate nobility.

The utility of classical poetics to a series like *Game of Thrones* is limited to its adaptability to modern aesthetic practices.[18] By design, classical dramatic themes and plots abound in *Game of Thrones;* the moral complexity of its characters, and their convoluted journey towards redemption or annihilation, is on par with the greatest dramatic plots of theatre history. The suffering of the conflicted protagonist gives Tragedy its profound emotional power. The structure of Tragedy provides key moments (*plot points*) that showcase the choices of the protagonist and their consequences. The protagonist's choices escalate the stakes of the play's action through these points, culminating in a powerful *climax* that resolves the central conflict in a maximally emotionally impactful way that best illustrates the themes the playwright wishes to tackle. Dramaturgs call the overall rise and fall of this action the *arc* of the story, describing the increasing emotional impact it has on the audience.[19]

Aristotle favored the form of Tragic drama because he felt it best moved the viewer to empathy in a significant and long-lasting manner, making the viewer a more compassionate, more thoughtful, and hence more virtuous person, in no small part

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[18] It is worth pointing out that the designation of "Tragedy" can be applied properly only to those stories which possess a true tragic arc, in which the climax is a resolution of all, or most, of the subplots. This designation will be less useful in examining vast narratives that are not designed from the outset to culminate in a grand climax. Many high quality television narratives are rather "open systems" that explore a certain situation (a mafia don sees a therapist, an irascible doctor sees what others do not, and so on). But even *Game of Thrones* appears to be synthesizing serendipity into its carefully planned plots. See Guglielmo Pescatore, Veronica Innocenti, and Paola Brembilla, "Selection and Evolution in Narrative Ecosystems," 2014 IEEE International Conference on Multimedia and Expo Workshops, 2014.

[19] The reason dramaturgs refer to the action of a play a "plot" is because it can be plotted on a graph that visualizes emotional impact as the y-axis and time as the x-axis. Tragic plots are referred to as "arcs" because when plotted they take on a characteristic semi-parabolic shape.

because of its deep engagement with the arc of a single protagonist.[20] But he also admired that the Tragic plot lays all the drama's evidence out very early, so that in retrospect the resolution of the plot is tied to something in the protagonist's life, perhaps a detail that might have seemed tangential or insignificant, that was present from the beginning of the story. The character (along with the audience) therefore has the opportunity to avoid the tragic outcome, but does not because of the *hamartia.*

But is this emotional power dependent on a single plotline with a single protagonist? Shakespeare combines elements of both episodic and tragic structures, creating complex narratives with multiple characters whose plots entwine to comment thematically on one another. Henrik Ibsen, considered the progenitor of modern realism in the theatre, wrote multiple plays on the same theme (each with a different protagonist facing similar choices) in order to allow multiple discussions from multiple points of view to emerge.[21] August Wilson's ten-play "Pittsburgh Cycle," read as a whole, forms *one overarching super-plot* that chronicles the history of a single family over more than one hundred years. All of these great authors use multiple plays to generate "master narratives" that exist outside the texts, one that requires audiences to actively make connections between them.

Aristotle's preference for Tragedy and its single protagonist is not necessarily at odds with modern vast narratives. The "vast narrative" concept itself is not new; the ancients were fond of using their religious stories, which we call "myths," as source material for performance, literature, sculpture, and decoration, and these stories existed

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[20] It should be noted that not all classical Tragedies in fact have a single character who occupies this position. Aristotle's *Poetics,* written decades after the height of Attic Tragedy, was likely meant as a jumping-off point for advanced dramatic criticism rather than as a definitive textbook.

[21] Johnston, Brian. *The Ibsen Cycle: The Design of the Plays from Pillars of Society to When We Dead Awaken* (University Park, PA: Penn State UP, 1992).

in vast and intricate webs of signification within and between artistic forms which were sometimes contradictory or told differently in different places or by different communities. Rather than squabbling about which version of the story was "true," artists capitalized on those differences in surprising ways.[22] The digital age, however, introduces some new factors into production and reception that make Mittell's emphasis on "cultural circulation" critically important. Mittell refuses to see any text "as a bounded, clearly defined, stable object of study," but rather as an "intertextual web that pushes textual boundaries outward, blurring the experiential borders between watching a program and engaging with its paratexts" including tweets, blogs, podcasts, documentaries, dvd commentaries, and perhaps also memes, parodies, cosplay, late-night television jokes, and any number of other sites of reception (7); to wit, the cultural circulation of an ecosystem.[23] But how may this complexity be rendered legible?

Mike Carey (author of *The Uncanny X-Men, The Girl With All the Gifts,* and Vertigo's *Lucifer*) cites the use of "fractal" by recent critics[24] to describe a continuous dramatic plot that advances according to critical choices made by more than one character. Which character is understood to occupy the position of protagonist at any

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[22] For instance, as Gregory Nagy observes in *Homer the Preclassic* (Los Angeles: University of California Press, 2015) the *Iliad* was perhaps intentionally structured as a performance text that encourages or even requires regional variations, each variation being part of a pattern of signification in dynamic and constant dialogue with itself, and is therefore not one static ancient text but millennia of interactive engagements with different audiences in different forms. It is also worth noting that television included complex characters whom the audience can see *change over time,* as opposed to the usual storylines which merely explore a situation and return to a kind of dramatic stasis at the end of each episode, long before the advent of the digital age. See Charles McGrath, "The Prime-Time Novel." *New York Times,* October 22, 1995.

[23] See also Tobias Steiner, "Steering the Author Discourse: The Construction of Authorship in Quality TV and the Case of *Game of Thrones.*" *International Journal of TV Serial Narratives* 1:2 (Winter 2015), 181-982.

[24] See, for instance, Wendy Everett's "Fractal Films and the Architecture of Complexity" in *Studies in European Cinema* 2:3 (Dec 2005), 159-71 (160); María del Mar Azcona's *The Multi-Protagonist Film* (Boston: Wiley & Sons, 2010) 34-38; and Patrick Jagoda's *Network Aesthetics* (Chicago: University of Chicago Press, 2016) 74-76.

one moment depends entirely on the aesthetic distance of the viewer. Characters who are clearly protagonists might be absent or even appear as antagonists from another perspective. Carey calls these "fractal protagonists," and notes that they appear in long-lived serial tales like superhero comic books and television soap operas, in which heroes and villains move in and out of key structural roles over time, interacting both within their own storylines and as tangential forces in the storylines of other heroes and villains. Over time, a vast intricately networked, wildly popular, and obsessively fact-checked mythological ecosystem is formed. This ecosystem involves dynamic collaboration between the creative team and many, many others, including millions or even tens of millions of fans. As a consequence, the analysis of themes changes depending on where the critic *chooses* to locate the protagonist at any particular point. This choice does not obviate the examination of other protagonists at other points, or even the same point, in the super-plot.[25] This notion of fractal protagonist is perfectly suited for *Game of Thrones*. In the next section, we return to data science to develop modes of analysis and communication that are well-suited to the myriad investigation of an assemblage of fractal protagonists, each contributing to the super-plot at different scales.

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[25] Carey, Mike. Personal Interview with Michael Chemers, 31 Jul 2017. [Quoted with permission] An excellent example of this type of protagonist appears in the original *Star Wars* trilogy: watching only *A New Hope,* viewers conclude that Luke Skywalker is the protagonist in a straight-up moral battle between Luke's good and an evil embodied by the antagonist Darth Vader. This is the structure of a typical melodrama, and is the basis for most action films. But taking *Empire Strikes Back* and *Return of the Jedi* into account reveals a structure more like a Greek tragedy. The trilogy is a psychomachia in which the fallen, deeply flawed protagonist, Darth Vader, must choose the actions that will bring about his downfall. Because the three films reflect and are in dialogue with one another to create a combined whole, both conclusions are correct, and Luke's struggle will ultimately cede center stage to that of his father. Thanks to the expert plotting of the movies, Vader's conflict becomes of primary interest to the viewer in the climax of *Return of the Jedi,* which is also the climax of Episodes IV-VI if seen as a single story: the disposal of the Emperor in what, to a theatre historian, looks like nothing more than a hell-mouth, a common set piece from the medieval theatre.

Character Centrality Diagrams and Networked Concordances

Before we can discuss, or even identify, fractal protagonists, we require a methodology with the following features. First, we must be able to detect and represent the scale of each character's arc within the greater narrative. Second, we need a way to compare protagonists, particularly across different scalings. Third, we must be able to present our evidence in a flexible manner, empowering the reader to simultaneously consider, and reconsider, the relative importance, status and actions of multiple combinations of characters.

The Character Interaction Networks in Figures 1, 2 and 3, which give primacy to relations between characters, make legible the complexities of the vast narrative. Yet these intricate visualizations are too baroque to accurately define a sense of scale, or even to directly measure characters against one another. To provide a simpler and more scalable visualization, we have created the Character Centrality Diagrams (CCDs) found in Figures 4, 5 and 6. Each diagram describes twenty prominent characters across four different measures, for a total of 760 rapid visual pairwise comparisons. Considering the three CCDs in sequence traces and contrasts the evolution of characters across seasons. The abstract simplicity of the CCDs provides an illuminating vantage point for character analysis. Demystifying our visual observations of a CCD requires that we zoom out to the network view, and ultimately further back to the source material itself. Indeed, like the other forms of data science, network analysis requires a deep understanding of the underlying domain in order to activate any quantitative insights.

Taken together, the CIN and the CCD constitute a "Networked Concordance" for a given season of *Game of Thrones*. This diptych provides a compendium of characters and their contexts, providing what Michael J. Preston and Samuel S. Coleman, early pioneers of computation in the humanities, would call a "crucial intermediate step" to link the series with "the world of critical ideas and insights" (9)[26]; that is to say, to produce evidence pertinent for analysis within larger social and aesthetic discourses. We refer to the CIN/CCD pairing as "networked" to emphasize that the organizing principle of this concordance is relational, not indexical. For brevity, we will use the acronym GOTNC for the suite of three *Game of Thrones* Networked Concordances considered herein.

We now describe the features of Character Centrality Diagrams. Primarily, a CCD plots eigenvector centrality (important connections, prestige) versus PageRank centrality (important interactions, agency). When a character lies below the diagonal, the impact of their actions exceeds their inherent network potential. Typical examples include Jon Snow and Daenerys: these remote characters have many interactions, but only infrequent contact with the other important characters. On the other hand, characters positioned above the diagonal have under-utilized connections. For example, Sansa is in close contact with the Lannisters in Season Three, but she has no influence among them. Meanwhile, Littlefinger and Varys lie above the diagonal for an entirely different reason: their subtle scheming goes undetected by design. In Seasons Three and Five, characters in proximity to the Iron Throne (the ultimate power in Westeros) typically lie above this diagonal. Season One is slightly different: in this case, eigenvector centrality indicates proximity to protagonist Ned Stark. This shifting

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[26] Preston, M. J. and S. S. Coleman, "Considerations concerning Encoding and Concording Texts," Computers and the Humanities 12:1-2 (1978), 3:12.

interpretation signals the necessity of taking the source material into account as we synthesize meaning from the CCD visualization. Interpreting CCDs for further cultural products will similarly require informed, custom interpretation.

The CCD conveys information via two additional modalities. Point size corresponds to degree centrality: the largest points denote characters with the most connections. Point shading corresponds to weighted degree centrality: the darkest points are the characters with the most interactions. Note that we have harnessed four modalities (horizontal, vertical, size, shading) to communicate four distinct categories of information. Visual engagement with the CCD reveals a variety of centrality combinations and recombinations. Each modality identifies clusters of characters. A vertical slice intersects characters with comparable agency. A horizontal slice finds characters with comparable prestige. Points of similar size correspond to characters with comparably sized neighborhoods. Points of similar shades correspond to characters with comparable interaction counts. The CCDs for the three seasons are strikingly different, so let us begin to interpret these diagrams.

The CCD for Season One confirms a conventional narrative structure focused on Ned Stark. As a rule, if PageRank increases, then so does degree and weighted degree, meaning that agency is roughly equivalent to the level of connection and interaction. On the other hand, the relationship between PageRank agency and eigenvector prestige is quite weak. While the top four characters (Ned, Tyrion, Catelyn, Robert) have a reasonable correlation, the second tier of characters features a huge spread of eigenvector centralities over a small window of PageRank centralities. For example, Jaime, Varys, Bran, Theon, Daenerys and Jorah show a strikingly broad

range of eigenvector centralities, in spite of their comparable PageRank scores. We argue that this lack of correlation provides evidence that the narrative revolves around the Lord of Winterfell: his universal dominance overwhelms the connection feedback loop, so that eigenvector centrality roughly corresponds to a character's proximity to Ned Stark in the network. PageRank does not get overwhelmed because weak ties dampen the PageRank connection boost across tenuous connections, keeping Ned's impact more localized.

The CCD for Season 3 tells a markedly different story. Robb edges out Tywin in a well-matched battle for most important character. Tyrion (who has *more* interactions than both the Young Wolf and the Old Lion) holds third place. A vertical slice reveals that Catelyn, Jon and Sam make up the second tier. Catelyn sits on the diagonal, suggesting high efficiency in converting her prestige into agency. As a counterpoint, Tyrion's efficiency has decreased, especially taking into account his superior interaction count. This imbalance bears witness to his frustration as a glorified wedding planner. Jon and Sam each sojourn north of the Wall, and their isolation suppresses their eigenvector centrality. However, their strong PageRank scores show great impact in spite of their weak local networks. Sam sparks for good reason: in Episode Nine, he creates a narrative convergence between Bran's band and Jon's wildling raiding party. The network does not believe in serendipity: instead, it marks him as a character to watch in seasons to come. The third tier features a very broad spread of eigenvector centralities concentrated in a narrow band of PageRank centralities. The wider distribution of eigenvector centralities reflects the variety of circumstance and adversity faced by the characters.

In the absence of Ned and Robert, members of House Stark and House Lannister shift rightward. However, the Starks trend downwards (excepting Robb and Sansa), while the Lannisters trend upwards. Sitting below the diagonal, Arya, Bran and Jon are on more arduous journeys, generating narrative importance (PageRank agency) in spite of their lack of powerful connections (eigenvector prestige). Meanwhile, Robb is ascendant as King-in-the-North, while Sansa is rewarded by the gilded cage of King's Landing.

The CCD for Season 3 reveals a very complex narrative system. The main story involves three characters (Robb, Tywin, Tyrion) instead of one (Eddard), and the gap to the second tier of characters has decreased. In general, characters are located further from the diagonal, indicating a stronger mismatch between agency and prestige. More characters are striving to improve their station, trying to overcome the relative deficiencies in their local networks.

This brings us to the CCD for Season Five. The top characters are Cersei, Jon, Littlefinger and Stannis. The strong performance of Lord Baelish is particularly noteworthy: he attains this success with far fewer interactions than the others. Zooming out to the network view of Figure 3 illuminates his achievement: Littlefinger is the lynchpin connecting the wheels of Winterfell and King's Landing. Furthermore, Petyr Baelish's meteoric rise marks his transition from covert scheming to overt triple-dealing (with Sansa, Cersei and Olenna) in his play to become Warden of the North. Littlefinger's bold departure from the shadows is among the most significant plot points of the season. The openness of his subterfuge might be underappreciated by the viewer (who has long seen it coming), but the two feedback centralities capture the magnitude

of this development.

For the first time, we have a very clear second tier, consisting of Tyrion, Sansa and Sam. This is a demotion for the Imp, who is adrift in Essos, and a promotion for Sansa and Sam. Liberated from King's Landing, Sansa's importance sparks to life along with her peril in Winterfell. Meanwhile, Sam's rise reveals that even non-heroic characters have an important role to play in Westeros. Our third tier consists of Arya, Daenerys and Jaime. Arya continues her downward trajectory, nearly disappearing into the Faceless Men of Braavos. Meanwhile, Daenerys has begun to rebound from her travails as Queen of Mereen.

Looking across all three CCDs, we observe some common trajectories. Most living characters trend rightwards, marking increasing PageRank agency. With adversity, characters experience a dip in eigenvalue prestige as their network becomes less powerful. This is followed by a resurgence in prestige and a further increase in PageRank that carries the character towards the diagonal. Characters start this parabolic arc at different times (e.g., Daenerys starts earlier, Sansa starts later) and they travel different distances. In addition, there are some characters who experience a rapid increase in both dimensions (e.g. Tywin, Robb, Cersei), but these quick ascents seem to mark tragic paths that are followed by a steep fall.

There is one conspicuous exception among the trajectories of main characters. The Kingslayer is the only major player who holds steady, having barely moved from his initial position in the CCD of Season One. Certainly, the viewer's opinion of Jaime has evolved over the series, and he has dealt with major hardship (losing his hand, son and

daughter). However, his prestige and agency have barely budged. We resolve the conundrum of the Kingslayer in the next section.

This brings us to the truly eye-catching pattern in the CCD for Season Five: for the first time, there is a significant correlation between eigenvector centrality and PageRank centrality. In other words, these characters are converging towards the diagonal (though Arya's continued descent is a notable exception that we explain later). These characters are achieving more stable network positions, tending towards an equilibrium where their PageRank agency and eigenvector prestige have comparable values. It is almost as if the formerly-isolated networks and their ongoing plots are being pulled together in the wake of some larger story, a super-plot that includes and affects them all, like solar systems following the gravity trails that form them into galaxies. Crucially, we predict that this trend will continue as the series approaches denouement, and that a character's location on the diagonal corresponds to their appropriate fractal scaling. This satisfying and implied diagonal captures the unseen and as-yet unseeable super-plot, traced out by a constellation of centralities. How do we make sense of this systemic, almost celestial, convergence? By employing fractal dramaturgy.

Playing the Game of Game of Thrones

So at last we come to our moment of convergence, where traditional aesthetics meets cutting-edge data analytics. A "fractal dramaturgy" does not seek to identify any single protagonist or plotline. Instead, it acknowledges that the messiness of a complex

plot is also one of its virtues, insofar as it allows an author to explore their themes from multiple angles. Social network analytics and data visualizations are necessary for rendering the plots within vast narratives coherent on multiple scales simultaneously, and thereby demonstrate the dialogic interaction between the many sub-plots which generate the super-plot. We suggest that this systemic dramaturgy does not repudiate traditional dramatic analysis, That said, it would be unproductive to completely abandon classical poetics, since vast serial plots are beholden to aesthetic conventions in place since ancient times. George R. R. Martin, the main author of the *Game of Thrones* novels and vision of the television serial, seems committed to crafting powerful, intricate plots that are deeply emotionally impactful. To maximize that impact, Martin's plots leave important clues to their own resolution that characters, if they had been less blinded by their *hamartias,* might have deduced to avoid tragedies.[27] References to classical authors and Shakespeare abound in *Game of Thrones* and are borne out by Martin's masterful long-term plotting. We argue, then, that it is unlikely that *Game of Thrones* will conclude without a climactic resolution that unites its disparate plotlines into a single, thematically-unified moment designed to be maximally emotionally impactful. This fractal super-plot, which we have come to think of as "The Song of Ice and Fire," does not exist *except* through analysis of the episodic sub-plots and their thematic relationship to one another. So we do not abandon the search for a protagonist - the character whose choices will be fundamental to the escalation and resolution of the super-climax - even as we expand our definition of what and who a protagonist can be.

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[27] Consider, for instance, Tywin Lannister's attempt to humiliate his son Tyrion by putting him in charge of the sewers of Casterly Rock: Tyrion will later use this experience to seize the fortress his father built.

The *Game of Thrones* Networked Concordance (GOTNC) focuses our attention on those characters that emerge as centers of discrete networks, or key connectors between networks, and it reveals how certain characters rise and fall in prominence over time. Our evaluation focuses on characters which GOTNC demonstrates maintain significance over the entirety of the plot, eliminating characters who emerge late or whose importance wanes (this does not preclude characters who die, since many characters continue to influence matters posthumously - even those who do not come back to life). Looking over the series as a whole and favoring characters who were present from the first, we have settled on seven major fractal protagonists,[28] whose arcs form the basis of our deduction of the major themes and the existence of the super-plot of "The Song of Ice and Fire."

Danaerys Targaryean: Mother of Dragons, Breaker of Chains, Danaerys' personal arc rivets the audience's attention. When she enters the plot, she is a victim of the schemes of unscrupulous men; a sexual and political commodity to be bought and sold. She endures unspeakable humiliation, abuse, and rape, but she finds the strength within herself to remake the world around her. Twice immolated in fiery infernos, she emerges unscathed and transformed, possessor of unspeakable power over the fates of others. But she fears that power, and what its uncontrolled exercise might do to harm innocents, and so she often hesitates to strike. She wants to rule, but she wants to rule wisely and well. The true test of her character seems to be in whether she will choose to sacrifice or delay her personal goals in order to bring her weapons to bear against the

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[28] Perhaps invoking the new gods of the Faith of the Seven (the Crone, the Father, the Mother, the Maiden, the Stranger, the Smith, and the Warrior)?

White Walkers. Isolated in the East, Danaerys' network is formed largely apart from the other major players who are favored by GOTNC for their connections to one another. Nevertheless, her position as an obvious protagonist is demonstrated by the ever-increasing strength of her network and her unstoppable rightward ascent on the CCDs. There can be little doubt that her role will only increase in significance.

Jon Snow: Bastard of Winterfell, Jon starts the plot as a rejected thing unable to be a part of the family he loves, so it is little wonder that he joins the Night's Watch hoping to find community in a group of exiles and criminals who devote their lives to protecting a society of which they can never be a part. Jon is defined by selfless duty, even when it means betraying those closest to him (first the wildlings in favor of the Watch, then the Watch in favor of the wildlings) for what he thinks is a greater cause. Clear-eyed and driven, Jon has given all he holds dear, even his own life, to defend humanity against the White Walkers. Jon, whose betrayals in this light seem more like sacrifices, seems one of the most morally clear characters in the story - his *hamartia,* repeatedly, is his inability to understand why others are not so willing to give up their own personal goals in favor of extinction-level crises. His arc takes him through the lower section of the CCD but by Season Five he emerges as one of the most important figures in the story. And yet at the time of this writing Jon still does not know himself truly, as the mysteries of his birth remain opaque to him just as the consequences of his learning his true heritage remain opaque to the viewers.

Cersei Lannister: Like Danaerys, Cersei begins the story as a woman treated as a sexual and political commodity, married off to a man she despises. She loves deeply, however: her brother and her three children by him. She gains our sympathy at

first, as a mother so fanatically devoted to her children's welfare that she is willing to do unspeakable things to protect them, and she pays a terrible price. It is interesting to note that until the death of Tywin Lannister, Cersei appears in GOTNC only in orbit around the vortices of powerful men (Robert, Tywin). But by Season Five, Cersei occupies the most powerful position on the CCD. Humiliated by the High Sparrow and outmaneuvered by Olenna Tyrell, Cersei shows some signs of the kind of self-awareness that Daenarys exhibits; a need to restrain the exercise of power for the greater good. But by Season Seven, Cersei has so effectively utilized her power to indulge in sadistic revenge that she can no longer be seen to be acting out of concern to anyone but herself. Her moral purity, although she is evil or at best insane, seems to put her out of the running for a classical protagonist, and she seems likely to join the Night King as the chief antagonist of the final episodes.

Sansa Stark: Sansa is a good candidate for a classical protagonist. She is proud and conceited when we meet her, so lost in a fantasy of herself as a romantic princess that she (like Danaerys and Cersei before her) becomes victim of the machinations of a callous and chauvinist society. Her relative youth and gender cannot fully excuse this *hamartia* (as her sister Arya's arc demonstrates). But she wisely employs her own suffering to cast away her illusions and emerge as a figure of greatness - an inspiring and capable leader who can handle the practical matters and careful diplomacy that her idealistic brother/cousin Jon finds baffling. Slowly but steadily rising on the CCD, Sansa's final test will come when and if she sees clearly enough to exert mastery over those who wished to use her as a tool for their own games.

Arya Stark: Fan favorite, Arya is one of the few characters whose *hamartia* has nothing to do with buying into other people's illusions. From the outset she, like Brienne, resisted her chauvinist society's attempts to imprison her in a romantic fantasy, and so was able to avoid being a victim in the schemes of wicked men. Like Brienne, Arya does not expect justice or mercy, but remains fiercely committed to her own authentic character. She confounds the attempts of the Faceless Men to make her into "no one" long enough to pilfer their secrets. Because of her low prestige and geographic isolation, by Season Five, Arya's graphic representation is a reflection of her character: small, alone, and fiercely persistent. By Season Seven, Arya's return to Westeros will result in a rebounding of both prestige and agency, signaling the final stage of her parabolic arc. But like other powerful women in this play, Arya's great power is vulnerable to being directed solely towards selfish ends as she ticks human lives off her to-do list. In the end, she will require a level of self-awareness to be like Brienne: an instrument of justice instead of revenge. As of this writing, Arya seems to enjoy violence a little too much, but this complexity keeps her a compelling protagonist.

Tyrion Lannister: The Imp remains critically important even as he does not seem to fit into customary conventions of dramatic storytelling. He is a deeply sympathetic character who, like the greatest protagonists in classical drama, suffers far more than he deserves. He possesses a rollicking postmodern cynicism which makes him an ideal *vox populi,* a position often occupied in classical drama by the chorus who act as the "voice of the people" to bridge the psychological divide between the audience and the main characters. Tyrion's strong showing in GOTNC results primarily from his liminality, his ability to move fluidly between communities and therefore unite them

better than any other character. This liminality derives from his abjection and inability to fit in. Tyrion harbors only a moiety of self-delusion at the beginning of the plot that he will ever find acceptance. The moiety is revealed, despite his self-deprecating attitude, by the fact that whenever he is given a job to do by his family, Tyrion tries to do his absolute best, and succeeds. Unfortunately, his ill-treatment by his family after the Battle of Blackwater confirms his darkest fears. During all this time, Tyrion is represented by GOTNC as a master of his own fate, a wandering star that visits multiple solar systems. His journey east captures him into Daenerys's orbit, where he chooses justice over revenge in a way that makes him even more sympathetic, but weakens his attractiveness as a classical protagonist. Still, it is impossible to discount the impact the Imp will have on the climax of the super-plot.

The other significant and long-lasting figures in GOTNC are a group of characters we might think of as "minor protagonists" but who might actually be serving more as foils to the more central figures: Sam, Bran, Varys, Petyr Baelish, and Theon, among others, whose story arcs have yet to be completed and who still likely have a significant role to play in the climax of the super-plot (whether they live or die). We find Theon to be uniquely compelling among his peers, with a brutal and cauterizing arc that makes him a foil for all seven of our major fractal protagonists. This leaves one central and significant character whose behavior on GOTNC is the most strange - an anomaly that demands the closest inspection.

Jaime Lannister: The Kingslayer begins the plot as a self-serving knight utterly unencumbered by any romantic or chivalrous notions that might frustrate satisfying his immediate pleasures. Nothing else seems to matter to him, including the welfare of

children (not of his psychotic eldest Joffrey, heir to the throne, nor of the innocent Bran who he casually attempts to murder to protect his incestuous secret) except his little brother, Tyrion, to whom he alone in his family shows affection and respect. Nor does he balk at the infamy he earned when he broke his oath to King Aerys, assassinating the Mad King to prevent the decimation of King's Landing by the dreaded alchemical explosive, wildfire.

Jaime views chivalry as a benighted illusion designed to trap the weak-minded, and this keeps him safe from forces like those that destroyed Ned. But this changes after his journey with Brienne, during which he loses his hand and becomes unable to fight. In his moment of vulnerability and suffering, he comes to recognize Brienne as a truly chivalrous knight who does what is right because it is right, without expecting the universe to repay her in kind. Importantly, this Season Three journey is the only moment in the story that GOTNC identifies Jaime as the *center* of his own community. Dramaturgy might suggest that this is a direct result of his growth as a character, a by-product of his internal conflict between compassion and selfishness. But he remains lost in internal contemplation as he surrenders his choices to Cersei. This does not change even when he finds that Cersei has committed the wildfire atrocity that Jaime killed Aerys to prevent.

As a result of this ambivalence, Jaime has remained in almost the same spot on the CCD, almost as if crucified by his own moral dilemma. We believe that this data is particularly significant, since it means that the Kingslayer remains the most morally complex and therefore strongest candidate for a central protagonist's role. We conclude from this that, one way or another, the ultimate resolution of the super-plot will ride in no

small part on a terrible choice that Jaime Lannister must make, determining not only of the fate of Westeros, but also the state of his own character.

The final task of the fractal dramaturg in this case is to compare the arcs of each of these characters, to analyze their decisions and their outcomes in dialogue with one another, seeing the super-plot of *Game of Thrones* as an ecosystem of thematically-linked fractal plots. The series, not yet complete, cannot be fully analyzed, but enough of the story has emerged to argue that all seven major protagonists struggle with the same dilemmas, reflecting the themes of the greatest of classical Tragedies. They all struggle to know themselves authentically, free of the distortions of self-delusion placed on them by others. They struggle to understand whether their own actions are warped by their *hamartias*, whether they be instruments of social justice and harmony or self-gratification and revenge. Taken as one, this fractal chorus sings the Song of Ice and Fire, the unhearable super-plot of this vast narrative.

However, one of the most important takeaways from the study of poetics is the recognition of the power that a masterful author has when he manipulates audience expectations in innovative ways. Martin's mastery became obvious at the end of Season One, when Ned, the classical protagonist he had painstakingly crafted, suddenly lost his head. Although we predict that the series will conclude with a maximally impactful mega-climax that unites and resolves all of its minor plots, we by no means anticipate that the benighted people of Westeros will be saved by a last-minute epiphany of compassion or the revelation of a promised savior or an act of heroic self-sacrifice or even a dragon-ex-machina.

In Martin's vast universe, even death itself is unconventional. Perhaps the purification of Westeros itself is the point - an opportunity to re-emerge in some unforeseen (but in retrospect, obvious) manner even stronger than before. This is a good metaphor: GOTNC is a tool for delving deeply into a vast dramatic narrative, but it will never definitively "win" the game of the *Game of Thrones.* That game will be played as long as the series, novels, spinoffs, webisodes, games, documentaries, parodies, and uncountable new cultural products that are inspired by *Game of Thrones* continue to be born and re-born. And if classical Tragedy is any predictor, that may be a long, long time.

Figure 1: Season One Character Interaction Network

Figure 2: Season Three Character Interaction Network
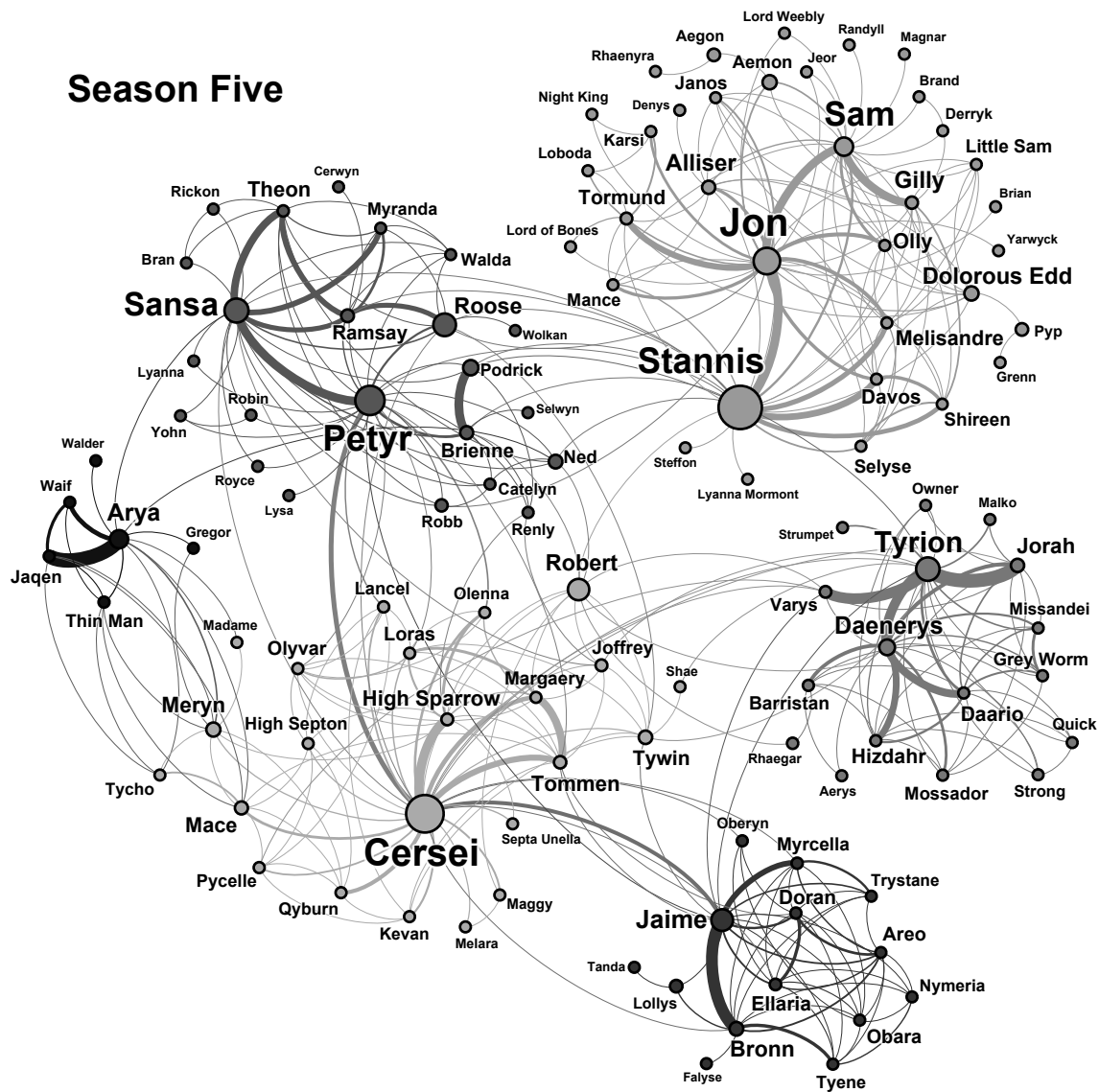
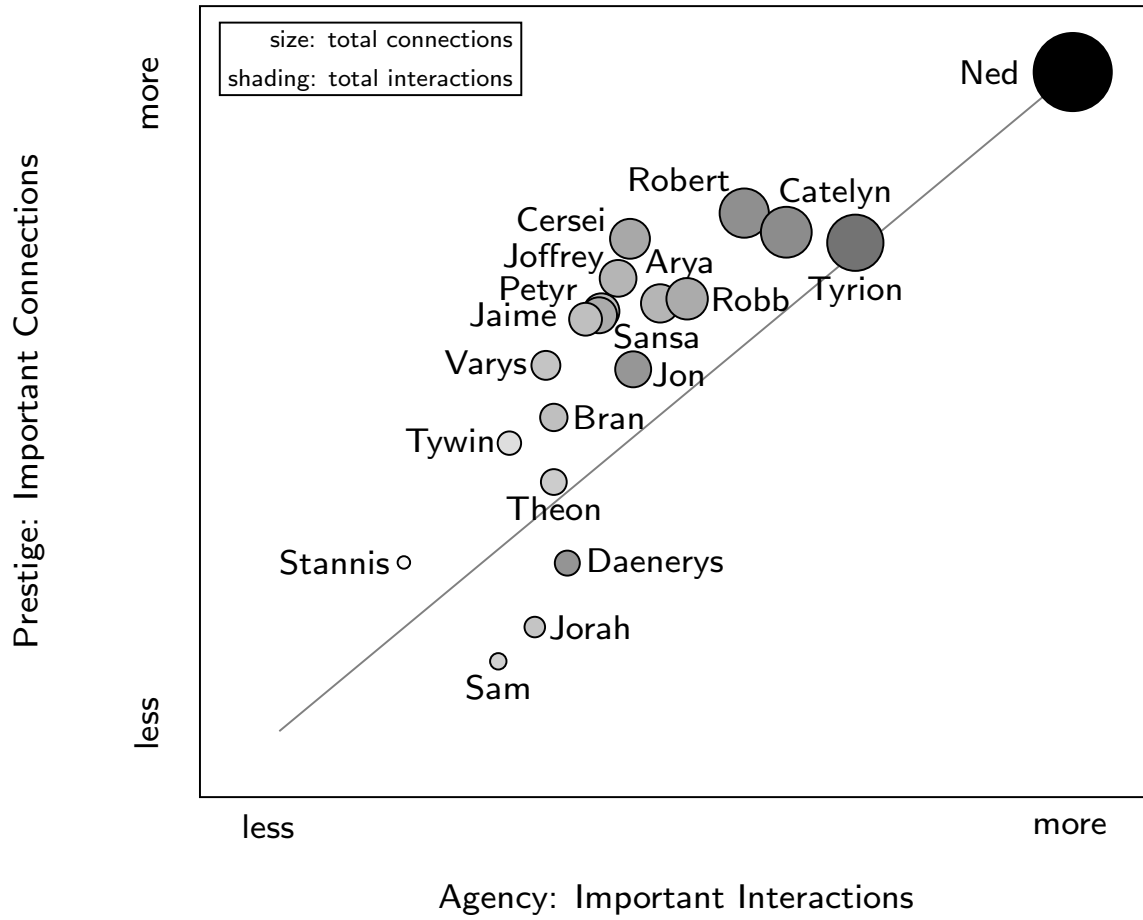Figure 3: Season Five Character Interaction Network

Season One

Figure 4: Season One Character Centrality Diagram

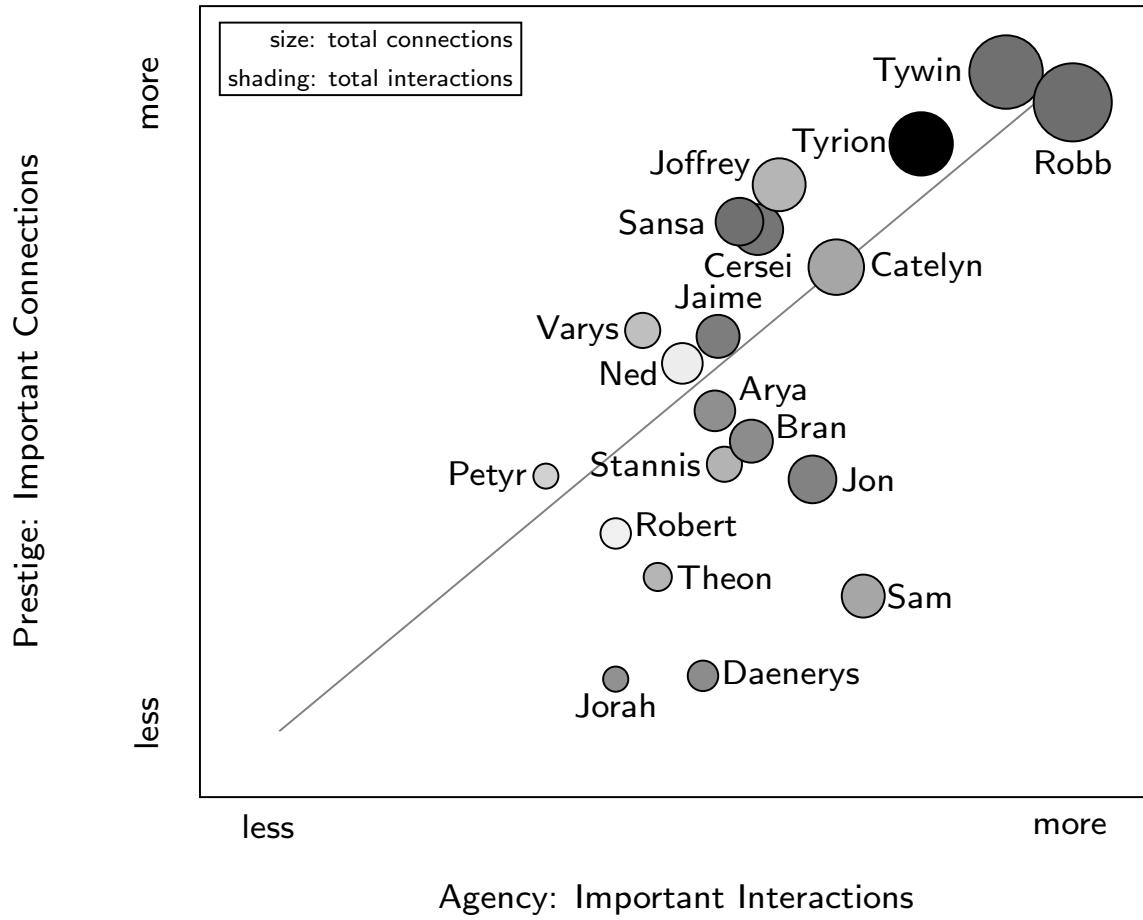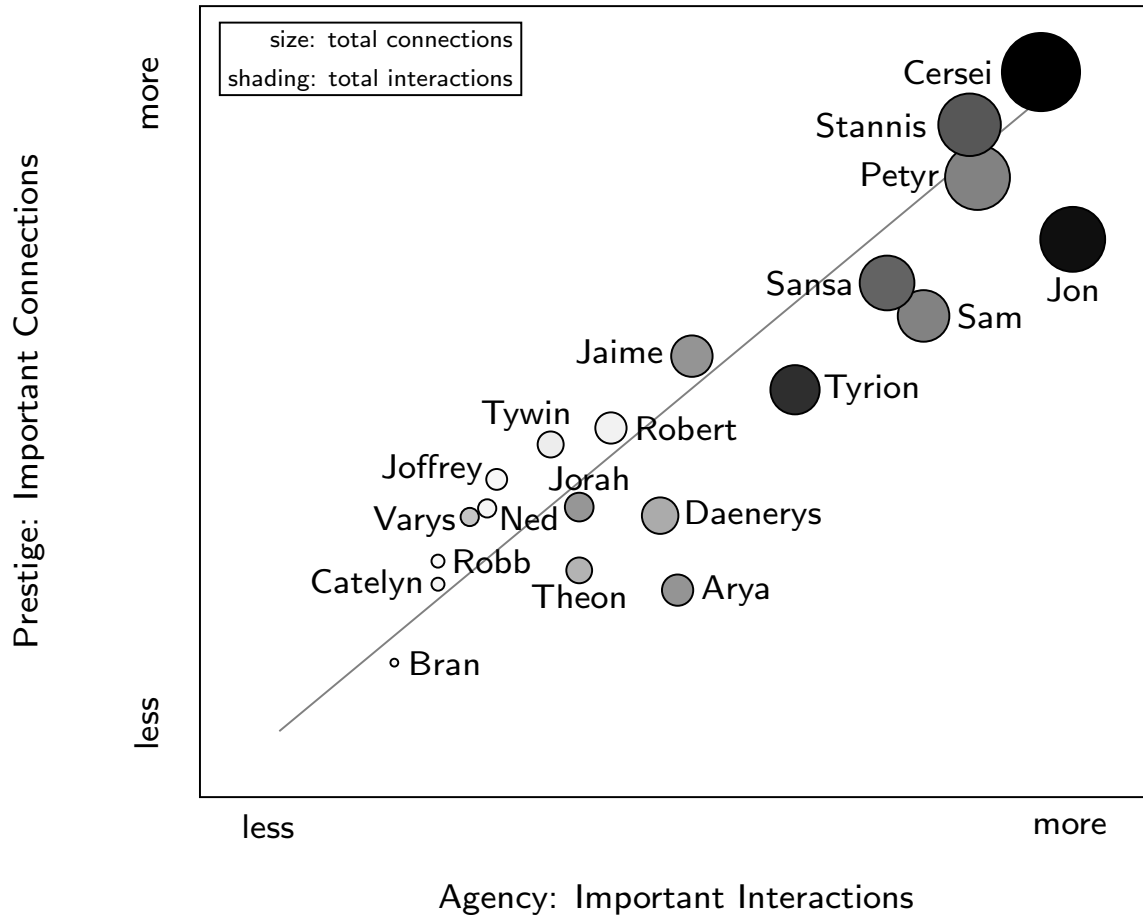Figure 5: Season Three Character Centrality Diagram

Season Five

Figure 6: Season Five Character Centrality Diagram