Abstract

This paper uses network theory and network analysis to propose a new approach to analyzing cross-dressing in Shakespearean drama, specifically the key questions driving much of the scholarship on that topic in recent decades: What kind of disruption to the social order did cross-dressing represent in Early Modern England, and what did it mean to shift that disruption from the street to the stage? We know that the laws and customs of the age emphasized clothing that matched the outward appearances of people to their places in the social order. Network analysis allows us to analyze how characters become gendered through a non-linear, non-hierarchical lattice of social relationships. As the characters interact and social relationships change, the individual's gendered subjectivity also transforms. We find that cross-dressing protagonists propel themselves from isolated social worlds into a complex web of relationships through cross-dressing, and that entry into sociability follows predictable patterns. By following those patterns, the characters combine roles—the broker and the heroine—that are normally separate in Shakespearean comic plots, creating a hybrid type that becomes visible through network analysis.

Introduction

This paper uses network theory and network analysis to propose a new approach to analyzing cross-dressing in Shakespearean drama, specifically the key questions driving much of the scholarship on that topic in recent decades: What kind of disruption to the social order did cross-dressing represent in Early Modern England, and what did it mean to shift that disruption from the street to the stage? We know that the laws and customs of the age emphasized clothing that matched the outward appearances of people to their places in the social order. A letter from John Chamberlain dated 1620 exhibits the Jacobean stakes of conventionally gendered dress:

Yesterday the bishop of London called together all his clergie about this towne, and told them he had expresse commandment from the King to will them to inveigh vehemently against the insolencie of our women, and theyre wearing of brode brimed hats, pointed dublets, theyre haire cut short or shorne...the truth is the world is very much out of order.

As Mary Beth Rose points out, the King's commandment “amounted to a declaration of war,” and the results of that declaration revealed that “women in men's clothing had assumed threatening enough proportions in the conservative mind to be singled out in a conscientious and thorough attempt to eliminate the style from social life” [Rose 1988, 70].

The conservatives of the time attempted, in other words, to enact the kind of restoration of propriety that Stephen Greenblatt perceives at the end of Shakespeare's Twelfth Night, in which “[t]he sexes are sorted out, correctly paired, and dismissed to bliss — or will be as soon as Viola changes her clothes” [Greenblatt 1988, 71]. Indeed, one way to view much of the cross-dressing in Early Modern drama is to see it as a fundamentally conservative set of practices.
From this perspective, cross-dressing allows actors and their audiences the pleasure of seeing binary, hierarchical gender relationships troubled temporarily, and not too much. Jean E. Howard maintains that female cross-dressers retain their “properly feminine subjectivity” even while dressed as men [Howard 1998, 432]. The heroines are then comfortably restored to women’s status in a conception of gender that remains, in Greenblatt’s phrase, “teleologically male” [Greenblatt 1988, 88].

Other scholars emphasize the extent to which cross-dressing fundamentally troubled conventional gender roles, especially in a theatrical world that involved all-male acting companies. As Phyllis Rackin puts it, the “boy actress’s body was male, while the character he portrayed was female. Thus inverting the offstage associations, stage illusion radically subverted the gender divisions of the Elizabethan world” [Rackin 1987, 38]. Marjorie Garber has reinforced this sense of radical subversion in arguing that cross-dressing historically signaled a “category crisis” for the very concept of gender [Garber 1997, 17]. Rackin and Garber present a disruptive potential of cross-dressing analogous — in this narrow way — to what Judith Butler identifies in the later phenomenon of drag: “In the place of the law of heterosexual coherence, we see sex and gender denaturalized by means of a performance which avows their distinctness and dramatizes the cultural mechanism of their fabricated unity” [Butler 1990, 137–8].

In the context of Renaissance drama, the perceptions of cross-dressing as fundamentally conservative or disruptive, as opposed as they seem, share a good deal of common ground. Both views see the potential disruption arising from all-male casting and the ways in which female characters cross boundaries while dressed as men, for example. Much of the disagreement arises from different assessments of the power of comic resolutions to contain that disruption. When the structure of comedy involves a movement from disruption to resolution, the difference between disruptive radicalism and reactionary essentialism can amount to a question of emphasis. Can the resolution contain the disruption? How much of the conventional hierarchy does a play restore when nominally female characters assume the clothing, legal status, and dispossessions of wives in patriarchal marriage?

This paper seeks, if not to break that impasse, at least to shift the terms of the conversation away from the linear placement of Early Modern theatrical cross-dressing on a scale from radical disruption to the conservative reinforcement of norms. Network analysis allows us to analyze how characters become gendered through a non-linear, non-hierarchical lattice of social relationships. As the characters interact and social relationships change, the individual’s gendered subjectivity also transforms. We find that cross-dressing protagonists propel themselves from isolated social worlds into a complex web of relationships through cross-dressing, and that entry into sociability follows predictable patterns. By following those patterns, the characters combine roles — the broker and the heroine — that are normally separate in Shakespearean comic plots, creating a hybrid type that becomes visible through network analysis.

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**Network Analysis Methods**

To perform our analysis, we generated network visualizations of each of Shakespeare’s plays including a crossdressing heroine using the Python library NetworkX. These visualizations, hosted at https://rmlp.net/shakespeare/, depict the relationships among characters scene-by-scene, shown as networks of nodes with edges connecting them. Across the play’s scenes, each node represents a single character and the edges linking nodes represent verbal interactions between the characters. Edge length represents the frequency of interactions between characters; i.e., characters that speak more lines to each other more frequently have shorter edges between them. Node size corresponds to the number of lines spoken by a given character in the play or scene in question. This means that the more lines a
character utters, the larger the radius of their respective node is. For example, if we were interested in analyzing the visualization for Hamlet, Act 1, Scene 5 (fig. X), we see there are four nodes, one each for Hamlet, Ghost, Horatio, and Marcellus. Hamlet and the Ghost’s nodes are considerably larger than Horatio or Marcellus’s because Hamlet and the Ghost speak far more lines than either of the other two characters in the scene. Edges connect those characters that speak to one another; i.e. Hamlet is linked to Ghost, Horatio, and Marcellus, because he speaks to all of them while Ghost is linked only to Hamlet because he speaks to Hamlet and only Hamlet.

Figure 1. Hamlet, Act 1, Scene 5.

We modeled our uses of NetworkX to measure and parse speaking relationships among Shakespeare characters after those expressed in Lee (2017). As such, rather than merely count exchanges between characters to create a simple character map, our visualizations include weighted relationships based on volume as well as frequency of speech — that is, we assign greater importance to longer utterances — ensuring a more comprehensive view of Shakespeare’s language than was typical before 2017. Building upon former methods, we also measured relationships using other social network analysis metrics to analyze our results [Wasserman and Faust 1994]. These included comparative degree counts (the number of edges connected to each node), density (the overall ratio of edges to nodes), and clustering (the probability of two nodes being connected if they are both connected to a third node). We display these metrics as graphs where applicable throughout the paper.

Network visualizations have proven useful in many academic disciplines in recent years because they rearrange linear data in a two-dimensional space, foregrounding formerly latent connections as a visible structure. In literary studies and other areas of the humanities, where our data (usually language) is primarily observed one-dimensionally (through reading), it can be difficult to accurately observe trends and large scale relationships, let alone reenvision primary sources among so many other competing ideas in the academy. This is especially pertinent to scholars interested in analyzing source data in widely read and written about subdisciplines like Shakespeare Studies. It is our assertion that network visualizations are one way to engage with Shakespeare Studies and Queer Theory in an innovative way while also remaining true to the text.

In another sense, reading Shakespeare as a series of networks also serves to circumvent presupposed organizing forms among characters. Because our networks are spatially arranged by machine, these visualizations represent the relationships among characters based only on the amount and directionality of their language. This means that relationships in the network are independent of qualitative taxonomies like social hierarchy, marriage, friendship, or employment [Lee and Lee 2017, 12]. Instead, our networks prioritize actual acts of speech to define relationships, away from any occlusion from paratextual descriptions provided in the list of characters or the implications of a name. For example, in As You Like It, while Touchstone does appear as a relative “touchstone” between characters in the networks, he is mathematically displayed as such neither because of his position as the fool, nor because of his apt name, but simply because of how much and to how many people he speaks. From there, we might enrich our reading of Touchstone with the qualitative facts of his character, but they do not inform the network at the generative end. This revisioning of Shakespeare’s plays as two-dimensional relative spaces based on direction and amount of speech was pivotal to our analysis because it shifts focus away from conventional organizing structures that we may take for granted and onto how characters actually function in the text itself.

While this project began with a general interest in the ways in which cross-dressed heroines are relationally positioned in Shakespeare’s gender-bending plays, our research did not initially start with a hypothesis or set of assumptions that we hoped to evidence with these network diagrams. Rather, we used the network visualizations as a way to perform exploratory data analysis of Shakespeare’s comedies in a different light. Ultimately, our findings confirmed to a certain extent existing understandings of the texts, as well as some conclusions drawn by other scholars interested in this area. We viewed such confirmation as valuable because it reinforced existing qualitative interpretations with a different mode of evidence gleaned from an independent method - network analysis rather than reading. Often however, as we will demonstrate in the following sections, our findings complicate, and at times challenge previous scholarly interpretations.
Embedding within the Social

Shakespeare’s comedies have been defined by “inversions of the norms of behavior,” which can temporarily provide “the exhilarating sense of freedom which transgression affords” [Gay 2002, 2]. This line of reading relies on a definition of Bakhtin’s carnivalesque from C.L. Barber, who famously posited that Shakespeare’s comedies hinged on a movement from release to clarification - from releasing vital energy normally “locked up in awe and respect,” to a “heightened awareness of the relation between man and nature” [Barber 2011, 6]. In Barber’s line of reading, the playful transgressions of the comedy unlock social energy by functioning as a sort of pressure valve.

Criticism on the comedies has more recently moved away from the binary poles of order and its inversion within the play’s plot, toward a more historically nuanced understanding of cross-dressing on the stage as a disruptive failure of gender representation. Specifically, Tracey Sedinger has suggested that cross-dressing on stage in the early modern context rejects a definition of sexuality in relation to embodiment or any object [Sedinger 1997]. Rather, the logic of cross-dressing in the comedies is a sequence with a specific narrative temporality. Our analysis supports this interpretation of cross-dressing by Shakespeare’s characters as a generative sequence or process re situating the gendered subject within the play’s social network, as opposed to a transgression in relation to a normative social equilibrium. In our network analysis, the act of cross-dressing by female characters does not cut against the grain of the normative social structure so much as it reconfigures the contours of the structure itself.

Our network visualizations show that when female characters don men’s clothing, the social network constructed between characters changes. The individual characters are thrust into dynamic webs of interactions, but more generally we see the proliferation of dense and tightly clustered communities. Those communities allow the protagonists to meet a variety of characters and ultimately participate in a social world that is at once larger and more complex. Density, which measures how many interactions each character has with the other characters in the scene, increases significantly after the female protagonist cross-dresses. The simple bar graph in Figure 1 shows the typical jump in density of interactions once the protagonist cross-dresses.

Figure 2 visualizes the interactions in each play that create the tendencies summarized in Figure 1. In Figure 2, for each play, we visualize four scenes from each play, in chronological sequence. In each case, the first scene (shown at the top
of the four-scene sequence) takes place before the moment of cross-dressing, and the other three afterwards. These are only selected scenes, but they illustrate the kinds of increasing density of social networks that create the overall effects captured in our analysis.

Looking at these patterns across the five plays, we see visual patterns emerging. The networks before cross-dressing are frequently structured like a barbell or a hub and spoke; the secondary characters are companions to the protagonists and do not interact with anyone but their masters and mistresses. That is, the networks cluster tightly around the major characters, who are isolated from one another. By contrast, when dressed as men, the female characters are able to join tightly bound networks in which many characters interact with each other. The high interconnectedness of these groups can also be measured by the clustering coefficient of these network, which increases in the plays after the female characters dress as men.

Clustering can be explained with the following example: if Viola knows Olivia and Olivia knows Sir Toby, then the likelihood that Viola and Sir Toby also interact is high. These complex social circles expand to include characters of different classes and professions: Julia is captured by outlaws, Rosalind barters with a shepherd, Portia dresses as a doctor of law and orchestrates a court scene, and Imogen befriends both shepherds and Roman soldiers. Thus dressing as men allows these women to escape the confines of these dialogues and participate with a larger community. Through escaping their isolation the female characters are therefore embedded in the larger network and able to become participants in the social drama of the plays.

The exception to this trend is Rosalind from As You Like It, whose density and clustering measurements decrease after cross-dressing and assuming the guise of Ganymede. The playtext, however, gives us some indication of why this discrepancy occurs. Rosalind aggressively stretches the limits of her gender play as Ganymede, by staging a metatheatrical courtship scenario with the lovesick Orlando, in which Ganymede plays the role of Rosalind:

I would cure you if you
would but call me Rosalind and come every day to
my cote and woo me.
(3.3.433-435)
In effect, Rosalind performs a double move, by initially adopting the male role of Ganymede, and then by performing the role of his object of desire, Rosalind. This complex layering of Rosalind's gender play based on her adoption of a female role when in male disguise, allows her to play with the gendered courtship behaviors shaping the encounters in the forest of Arden by switching between object, subject, and ultimately the end of the play, the mediator of desire. Rosalind’s oscillation between male and female identities may account for this specific play’s density and clustering measurements.

These networks suggest that that all five of the cross-dressing protagonists experience a change in sociality: when they put on men’s clothing they are no longer limited to one-on-one dialogues, but instead enter into a dense and interwoven community that allows for the drama to unfold. King James I recognized these effects that cross-dressing could have on the larger society when he expressed his fear that cross-dressing would create a “world very much out of order.” However, Shakespeare paints a different picture of its influence: rather than creating chaos, cross-dressing transforms a sparse and isolated world into one that multiplies social interactions.

Brokerage: The Individual within the Network

Drawing on theory of corporate organizations, Richard Jean So and Hoyt Long argue for the importance of brokerage functions in networks: when a network has two subgroups divided by a gap, the “broker” fills the hole in the network and thereby enables connections among the other people who had been separated [So and Long 2013, 162]. So and Long draw on the work of Ronald Burt, who writes, "A structural hole is a potentially valuable context for action, brokerage is the action of coordinating across the hole with bridges between people on opposite sides of the hole, and network entrepreneurs, or brokers, are the people who build the bridges" [Burt 2005, 18]. We find this concept of brokerage useful for describing the implications of our analysis. As the female protagonists move into the denser networks they inhabit while dressed as men, they enable the comic resolutions of their plays by connecting communities that begin the plays as separate social worlds.

On this point, the finding of the network analysis is intuitive and consistent with textual evidence from the plays. For example, in As You Like It, Rosalind leads Touchstone and Celia into the forest, where the group meets the shepherd Corin. Although Touchstone tries to assume the typical male role and parley with the shepherd, Rosalind hushes him and then bargains:

Buy thou the cottage, pasture, and the flock,
And thou shalt have to pay for it of us
(Il. V.95-96)

In this exchange, Rosalind orchestrates a business deal between Corin and the party or “us” that Rosalind represents. Rosalind likewise manages Silvius and Phoebe’s relationship: “Cry the man mercy, love him...so take her to thee shepherd” (V.V.491). Here, Rosalind addresses one party, then the other, ultimately joining the couple together. In Cymbeline, Lucius entreats Imogen to speak for him: “I do bid thee beg my life, good lad” (V.V. 490). When she complies, Imogen acts as a bridge between Lucius and Cymbeline. Likewise, in The Two Gentlemen of Verona, Julia acts as an ironic go-between to profess Proteus’ love to Silvia: “And now am I, unhappy messenger” (V.V. 116). And in Twelfth Night, Viola acts as a bridge between Orsino and Olivia: “All the occurrence of my fortune since/ Hath been between this lady and this lord” (V.I. 270-271). When the visual networks show that the cross-dressers are brokers, they therefore highlight a role that was already embedded in the text.

The less intuitive aspect of this brokerage function lies in the brokers’ centrality to their respective plays. The broker is more typically a marginal figure whose importance lies in creating connections whose importance outweighs the broker’s own. As So and Long put it, “One’s eyes naturally focus upon the massive ‘sun’ or smaller ‘stars’ that occupy our network visualizations, yet somewhat less visible broker figures significantly populate the literary field” [So and Long 2013, 163]. This model accurately describes the function of Shakespeare’s more typical brokers, such as Horatio and Gertrude in Hamlet, who do not cross-dress. As we can see Figure 4, the cross-dressers speak more and form more connections — measured by degrees, or the number of links to other nodes from each character — than do Gertrude and Horatio.
In this visualization, to compare the degrees and lines across plays, the numbers are represented as a percentage of the total degrees and lines of each play. Within a given play, we can use the unadjusted number of degrees to illustrate the connectedness of the characters relative to one another, as shown in Figure 5.

All of the cross-dressing protagonists are among the three most connected characters (in Imogen’s case, tied for third) in their respective plays. In Figure 6, network visualizations of scenes illustrate the connections that constitute each protagonist’s network.
In the network of each play, the most connected characters have the smallest distances to other characters; put more technically, they minimize the sum of all distances to all other vertices. In the visualizations, therefore, the nodes of the most connected characters appear tightly clustered with the nodes of other characters.

We can take this line of thinking an important step further: not only do the cross-dressing characters combine the roles of heroine and broker, but in doing so, they also assume a dramatic centrality beyond that of their counterparts in other Shakespearean comedies. Compare the networks formed by cross-dressing heroines, for example, to the position of the main female characters in two late scenes from comedies without cross-dressing characters, *Taming of the Shrew* and *A Midsummer Night's Dream*. 
In both of these networks, non-cross-dressing female characters (Katharina, Bianca, Helena, Hermia, and Hippolyta) occupy positions at the margins of the networks. Cross-dressing female protagonists consistently gain a central position in the social networks involved in the final moves of the plays. Female characters who retain conventional dress and gender conventions, on the contrary, occupy a marginal social position during crucial scenes of narrative resolution.

**Implications for Network Structure and Gender**

Considering a cross-dressed heroine in terms of networked sociability helps us see that character’s gender in terms of relation as well as identity: the cross-dressing not only allows a character initially gendered female to act like a man, so to speak, but it also allows her to connect like a man. The social worlds of all of these plays are male-dominated, in that
characters of all genders speak primarily in response to men, but we find, in the data as well as intuitively, that male characters respond to men more than female characters do, reflecting the plays' tendency to incorporate same-gender and well as mixed-gender conversations. The cross-dressed heroines, however, respond to male characters even more than other male characters do. As Figure 8 illustrates, when wearing men’s clothing, the heroines inhabit the social relations of men (or even statistical super-men), even to the point of leaving behind the conversational connections to other women that have previously defined their relationships.

These visualizations share a common assumption: that gender in the plays arises initially from the categorizations that the text offers us and, subsequently but crucially, from the nature of the characters’ interactions. In this latter aspect, gender is fundamentally relational. In a more conventional linear model of gender, masculinity and femininity constitute two poles, and the focus of analysis is an individual character using cross-dressing to traverse the distance between those poles. Rather than investigating the gender identity of isolated characters — no matter how complex those identities may be — our approach instead describes the social relations within dynamic systems that produce the performed effects of gender in the plays.

The grounding of our approach in textual rather than contextual data creates our focus on the carnivalesque effects of cross-dressing within the action of the plays. We do not mean, however, to minimize the importance of other approaches: for instance, Rackin’s helpful insistence on the gendering of the actors in all-male performances of the plays implies another kind of network visualization, showing every interaction as a male actor (in both senses) speaking exclusively to other male actors, with our conception of mixed-gender networks operating in ironic tension with that all-male theatrical world. And that is not to mention yet another layer of complication: that the “male” actors of those companies may also have experienced their gender as relational or non-binary, thus implying in their irrecoverable subjectivities another kind of multiply gendered network functioning in any given performance.

In closing, we step back from the landscape of nodes and edges to consider the implications of our analysis for reading
passages of these plays in light of a networked conception of gender. Jean Howard has made the case that the cross-dressing heroines fail to disrupt gender relations fundamentally because the cross-dressing women are reabsorbed into the conventional social world by the end of the plays. Howard argues that in the conclusion of Twelfth Night, for instance, “real threats are removed and both difference and gender hierarchy reinscribe” [Howard 1998, 35]. While Howard concedes that As You Like It “shows a woman manipulating [gender] representations in her own interest,” Howard still maintains that the play ultimately has the “primary effect...of confirming the gender system” [Howard 1998, 37, 36]. However, in the midst of her argument, Howard does note that this recuperation of the gendered subject in the social world “is never perfectly achieved” [Howard 1998, 41].

Howard’s reading persuasively accounts for the conservative movement of these comic plots as well as the disruptive and incompletely contained undercurrents that cross-dressing creates. We perceive another reading that moves away from the conservative/radical opposition at the heart of that reading. In Twelfth Night, Viola initially voices her desire to escape the bounds of society and create her own agency:

O, that I served that lady,
And might not be delivered to the world
Till I had made mine own occasion.
(I. II. 43-45)

Here, Viola eschews typical feminine passivity and fantasizes that she will enter the social world once she has “made” her own place within it. Viola’s efforts, however, lead her not to independence but entanglement, as with the lives of Orsino and Olivia:

O Time, thou must untangle this, not I.
It is too hard a knot for me t’ untie.
(II.III.40-41)

In this moment, Viola states that she cannot individually control the “knot” of society, even though she may shape it through her decisions.

Viola thereafter voices a new understanding of her agency that is contingent on her social circumstances:

Do not embrace me till each circumstance
Of place, time, fortune, do cohere and jump
That I am Viola;
(V.I.263-265)

Here, Viola recognizes that she cannot entirely “make her own occasion.” Even her most fundamental statement of named identity, “I am Viola,” becomes a dependent clause that is shaped by the space she inhabits, namely, the “place” as well as the “time” and “fortune” of her circumstances. Furthermore, all of those contingencies build on the fundamental irony of acting, that the pleasure of watching the play involves understanding that, in voice and body, Viola is not Viola at all.

We propose that network analysis allows new and complementary understandings of the kinds of identity and contingency, being and relationship, that enable performed gender to make, and be made by, its own occasions. Our visualization of these Shakespearean networks illustrates cross-dressing not as an individual character’s movement a simple spectrum of more or less disruptive gender performance, but rather as an act of social reconfiguration made more visible by visualization methods such as social network analysis. By cross-dressing, the heroine moves to the center of a complex social world and brokers its transformations during the part of the play in which she dresses as a man. Even after she changes back into a woman’s clothing, in a seemingly dismaying regression back to the governing social norms that James I’s “commandant” sought to preserve, the play’s resolution comes about subtly in response to her more fundamental remaking of its networked communities.

Works Cited


Lee and Lee 2017 Lee, James, and Lee, Jason. “Shakespeare’s Tragic Social Network; or Why All the World’s a Stage,” *DHQ: Digital Humanities Quarterly*, 11, no. 2 (2017).


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