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1.1 chapter summary

The burden of this chapter is to describe how to do text analysis in a way that attends to queer concepts of gender performativity, and how that method might leverage computational processes to analyze literary material that express complex gender ontologies. I begin the chapter by debunking what I call "the fantasy of falsifiable criticism," which includes distant reading practicies by Franco Moretti and Ted Underwood, constrasting their work with that of Richard Jean So and Laura Mandell, whose methods emphasize deconstructing social categories. While this deconstruction is important, I'm interested in analysis of text that disrupts what we know about these literary materials by creating new forms for understanding phenomena such as gender ontolgies. For the middle portion of the chapter, I embark on three "close-readings" of computer programming, gender theory, and my source text, *Orlando: A Biography* by Virginia Woolf. First, I delve into python programming, focusing on the structure of the `for loop` and processes for cleaning and regularizing text, with the goal of bringing out the recursive quality of running python code. Then, I dip into Judith Butler's concept of gender performativity, which lends an understanding to the ways that critical processes can subvert dominant structures through iteration, or what she calls "performative citation." To wrap up this section, I do a close-reading of Woolf's *Orlando* that examines the ways that gender is closely coordinated with the significatory power of language throughout the novel. In the final section of the chapter, I apply Butler's notion of displacement through repetition in gender performativity back to text analysis to illustrate how the iterative process of analyzing text can surface new textual structures that re-signify certain elements of that text. The chapter ends with my text analysis of Virginia Woolf's *Orlando* to demonstrate how "man" and "woman" in that text is re-signified from its initial binary structure into a plural understanding

1.2 The fantasy of the falsifiable

This chapter examines how quantitative text analysis, which is a way of analyzing textual data by counting its features or elements, such as calculating word frequency or generating associative word pairs, works with data about gender ontology. This examination probes the central tension between "Queer Form," or figurative and narrative forms by which gender is expressed [further elaborated in the introductory chapter], and digital formats, where the logics computation abstracts and transforms text into data. The process of preparing a text for text analyis always requires a reduction of data in which some semantic value has escaped. Common tasks like cleaning and normalizing, where text is transformed into a format to make it computable, constrain textual meaning by passing text through an automated seive, filtering out its specificities. For example, in order to be counted in a word frequency, text has to be rid of elements like punctuation, articles, prepositions, and word endings. Rather than attempt to recover semantic escape, I am interested in exploring how possible approaches for quantification might engage with gender as a complex phenomenon.

Distant Reading is a way of computing textual data by cleaning, sorting, and counting textual elements, and can involve more advanced processes like statistical modelling and machine learning. It borrows from quantitative methods in the social sciences, applying them to textual data, for example in word association, topic modeling and sentiment analysis. Though they differ in their specifics, these methods share a faith in using the speed of computation, which can process very precise elements like word frequency or syntactic patterns, to make calculations about how to categorize or organize textual data. Moreover, they are part of a scientific method meant to guide researchers in conducting experiments that prove or falsify their hypotheses. The scientific method is a cyclical process, wherein researchers make observations on a certain topic, formulate a hypothesis, test the hypothesis with experiments, analyze and report the results, bringing them toward new observations, hypotheses, experiments, and conclusions.

Franco Moretti, who is largely responsible for popularizing the practice of Distant Reading in English Studies contexts, greatly influenced the ways that English scholars approach quantiative methodologies. Because computers can process hundreds of texts at a time, "reading" at much faster rates than humans, they offer critics an opportunity for getting around the problem of literary scale, and particularly attract critics like Moretti who pose ambitious questions about literary history. Moretti's scholarship explores how social and economic forces impact literary form in the development of the modern

novel. His subject is the vast swatch of modern literary history, thousands of texts that would otherwise be too large and unweildy to work with. He declares that "distance ... is a condition of knowledge" (*Distant Reading* 48). Other scholars follow a similar path. More recently, Ted Underwood, in the field of Computational Literary Studies (CLS), harnesses the power of quantification and machine learning to glimpse what he calls the "distant horizon" of literary trends across centuries[1]. Some recent developments in distant reading combine with close reading methods, as critics will use the results of quantitative analysis to identify key moments from the text that merit closer attention.[2]

I begin with Moretti, because it is important to examine where the impulse for reading distantly emerges in his work. In Moretti's early essay, "The Soul and the Harpy" (1983),[3] he divulges a key motive in developing his methodological approach, which will eventually flourish into "distant reading." Underlying Moretti's methodology is a deep concern with finding a way to ascertain the effect of historical forces on literary form. But the current practices of literary criticism present methodological obstacle. In this early essay, Moretti characterizes literary criticism as "a sort of cultivated accompaniment to reading – to the reading we are doing here and now," ("The Soul and the Harpy" 21). By this, he means that the analytical practices of contemporary literary critics, which "revolve around concepts such as 'ambiguity' and the like," will, according to Moretti, "always be pushed into multiplying, rather than reducing, the obstacles every social science encounters when it tries to give itself a testable foundation" (22). To illustrate the practices of current literary criticism, Moretti distinguishes between the historian and the student of literature:

> The [student] – unless desirous of turning into that legendary figure whose only pleasure lay in contemplating his own reflection – must concentrate on the dissimilarities and ruptures: on what has been lost and become irretrievably unfamiliar, and which

[1]Underwood, Ted. *Distant Horizons*, 2019.; Underwood, Ted. "Machine Learning and Human Perspective." PMLA, Vol. 35 No. 1, January 2020, pp. 92-109.

[2]Andrew Piper's methodology, which he calls "bifocal" reading, demonstrates how distant and close reading are used together, with distant reading providing the context or framework that guides close reading""We are no longer using our own judgments as benchmarks... but explicitly constructing the context through which something is seen as significant (and the means through which significance is assessed).... It interweaves subjectivity with objects" (Piper, Andrew. Enumerations: Data and Literary Study, 2018, 17).

[3]Moretti, Franco. "The Soul and the Harpy." *Signs Taken For Wonders: On the Sociology of Literary Forms*, trad. David Forgacs, New York, Verso, 1983, pp. 1-41

> we can 're-familiarize' only by doing such violence to it that we distort the objective, material consistency of every work which it is the task of scientific knowledge to reconstruct and 'salvage'. 14

According to Moretti, the great danger in literary criticism is the encouragement of narcissistic tendencies in researchers, whose attempt to "re-familiarize" the object of study does it "violence". Moretti's proposed method therefore would take a scientific approach that maintains the "objective, material consistency" of the work. Here, Moretti proposes a mode of critical inquiry that borrows from the sciences to minimize the potential for difference and disagreement. Grounding the critical process on a more solid foundation, Moretti calls for a "falsifiable criticism" that can "test" literary interpretations, much like a social science ("The Soul and the Harpy" 21). *Falsifiable* here means that it must be contestable – one must be able to imagine an alternative, to ensure that the hypothesis can be meaningfully tested. Falsifiable criticism would pursue interpretations as "coherent, univocal, and complete," where the "results" can be compared with "data" which "appear contradictory or inexplicable in the light of the hypothesis itself" (21). He envisions a literary criticism that will slowly but steadily progress toward irrefutable knowledge of literary objects: "The day criticism gives up the battle cry 'it is possible to interpret this element in the following way', to replace it with the much more prosaic 'the following interpretation is impossible for such and such a reason', it will have taken a huge step forward on the road of methodological solidity" (22).

Moretti's falsifiable criticism eventually grows into "distant reading," and particularly, "quantitative formalism," which quantifies literary form into visual formats like graphs and diagrams. Moretti's quantitative formalism attributes the bulk of analytical work to computational and visualization processes, and relegates the literary critic to the role of explaining the results of the computer's analyses. The essays in *Distant Reading* increasingly demonstrate how his critical method streamlines into the neat, recursive processes of hypothesis, collecting and assembling data, and inference. The results are often unexpected, and sometimes bring Moretti to reframe his hypotheses. For example, in "Style, Inc.: Reflections on 7,000 Titles (British Novels, 1740-1850)," Moretti plots book titles on a series of graphs in order to explore how market forces influence the titles. He explains that "the title is where the novel as language meets the novel as commodity" (181). He finally concludes that titles are quite sensitive to the market: "As the market expands, titles contract; as they do that, they learn to compress

meaning; and as they do that, they develop special 'signals' to place books in the right market niche" (204). This is an exciting interpretation, which is borne by the various graphs of title lengths over time, but a closer look at Moretti's language obscures the extent to which his critical process involves interpretation at every step:

> In what follows, I focus on three moments of this history: first, I *describe* a major metamorphosis of eighteenth-century titles, and *try to explain* its causes; next, I *suggest* how a new type of title that emerged around 1800 may have changed what readers expected of novels; and finally, I *make a little attempt* at quantitative stylistics, examining some strategies by which titles point to specific genres. Three sections, three pieces in the large puzzle of the literary field. (181-2; emphasis mine)

This language presents the literary critic's work as an objective description of unproblematic reality. Additionally, although his speculations are provocative, Moretti presents them as supplementary to the graphs. Moretti's diminishing language–he *describe[s]*, *tr[ies to explain*, *suggest[s]* and *make[s] a little attempt*–belies the nature of his intervention. After all, it is Moretti who poses the question, inputs the data, and draws conclusions from the graphs. The computational ability of the computer emboldens Moretti to make larger claims about literary history, all the while diminishing his role as in analysis. His approach almost appears to aim toward reproducing analysis to the point of automation.[4]

With the rise of digital methods like distant reading, the faith in falsifiable criticism also grows, and even dominates the thinking of those who are generally critical of distant reading in literary studies. For example, Nan Z. Da, in her critique of scholars like Underwood, argues that quantitative methods, which belong in scientific methodologies, are ill-suited for literary studies. She accusses Ted Underwood and other distant reading practitioners for trading "speed for accuracy, and coverage for nuance" (620). Of her many gripes with quantitative methods, which include "technical problems, logical fallacies," and a "fundamental mismatch betwen the statistical tools that are used and the objects to which they are applied" (601), she emphasizes the lack of *reproducible* results, the idea that one researcher's process can be reproduced by another with identical output. She demonstrates this

[4]Stephen Ramsay, in *Reading Machines* makes this point in his critique of Moretti. Accrding to Ramsay, Moretti's claims that his insights are "independent of interpretation" and his goal of "falsification" suggest that "data is presented to us... not as something that is also in need of interpretation" (*Reading Machines* 5).

lack of reproducibility with an experiment of Topic Modelling, which is the processing of large texts in order to generate a number of "topics" within the corpus. Researchers often use Topic Modelling as a way of speed-reading a massive corpus to get a sense of what it is about without having to read the text in full. Da attempts to verify the results of a Topic Modelling experiment by replicating the process on her own machine, a replication that fails. She concludes that, "if the method were effective, someone with comparable training should be able to use the same parameters to get basically the same results" (628-629). Keeping in mind that topic modeling will return different results with even slightly different parameters,[5] it is important to note that Da places a faith in reproducibilityas as a benchmark for reviewing and assessing the efficacy of quantitative methods.

This kind of reproducible criticism is where Moretti's fantasy of the falsifiable leads. Despite their vastly different committments, scholars like Moretti align with Da on the faith that they place in the analytical capacities of the computer: Moretti in seeking a falsifiable method; and Da in suggesting that CLS methods fail in their goal to resemble the social sciences. In both cases, there is a implicit faith that the computer can do some of the analytical work that has been traditionally ascribed to the human.

This reproducible approach blocks out other kinds of connection to text. Other approaches, by contrast, looks at distant reading for how it might attend to some of the more slippery concepts of social categories such as race gender. In order to address marginalized aspects of identity, in a way that does not reproduce our assumptions, we have to ask questions that do not assume that we already know the kind of thing we are looking for.

One example of distant reading explores how to handle questions of racial identity and discourse in novels. Richard Jean So and Edwin Roland use machine learning to explore the constructedness of racial categories by experimenting with an algorithm that evaluates an author's race according to the vocabulary used by the author. When they look more closely into these results of using the algorithm on a large corpora of novels by white and black authors, they find that it reveals different levels of variance in words traditionally attributed to white and black authors: while novels by white authors are distinguished by a low variance in this vocabulary, novels by black authors show a greater variance in vocabulary (66). They conclude that white authorship, as a category, only coheres against the incoherence of

[5]For a more thorough critique of Da's aims and methodology in this article, please see Ben Schmidt's "A computational critique of a computational critique of computational critique," *Ben Schmidt*, Dec 5, 2019. `https://benschmidt.org/post/critical_inquiry/2019-03-18-nan-da-critical-inquiry/`

black authorship. In other words, they find that whiteness *depends* on the characterization of blackness.[6]

So and Roland explain that this quantitative excercise is more useful for what it teaches us about quantitative approaches, rather than what it teaches us about race. They decide to explore an error that wrongly categorized James Baldwin's novel, *Giovanni's Room* (1956), as being written by a white author. So and Roland point out that this misclassification recalls a critical debate about this text's notorious elision of explicit references to race, whereby racial markers are displaced in favor of an implicit whiteness. One of the words in *Giovanni's Room* that influence its categorization as a white-authored text is the term "appalled." So and Roland point out the connotations of whiteness in "appalled," which has the middle French root, "apalir," meaning "to grow pale" (71). They discover that this term occurs only once in the text, in the early scene where David (the narrator) describes his relationship to his father. Here, David rues his father's friendliness: "I did not want to be his buddy. I wanted to be his son. What passed between us as masculine candor exhausted and appalled me" (Rpt. in So and Roland 71). They insightfully conclude that the word "appalled" in the text marks "the moment David develops a troubled relationship to normative masculinity [as] also the moment he becomes 'white'" (71). Taking the computer's mistake as a starting point, their analysis thus contributes to the ongoing debate about the the complex relationship between race and sexuality in the novel.

So and Roland assert that, while "Race is a category that escapes measurement or simply renders it untenable," the machine is an apt tool for studying this category" (60). In a sense, So and Roland are confronting the same problem as Da: what is the effect of computational error in literary criticism? But rather than write off quantitative methods, So and Roland suggest an interesting way out of the problem: use the error as a starting point for further analysis, which probes the constructedness of gender ontology. Because race is a social construct, and machines only impute meaning that is encoded into them, than it stands to reason that machines might be ideal instruments for studying the construction of race. Computational error becomes an opportunity for exploring the encoding of racial identity. Looking more closely at the specific results of this analysis, like the function of the term "appalled" in *Giovanni's Room*, they can make more daring leaps of speculation about how whiteness, while displacing blackness, also gestures

[6] Tie this relationship on the white/black binary to Eve Sedgwick's points about binaries containing an oppostional dynamic in which the subordinated term props up the dominant term.

toward a troubled understanding of gender and potentially, sexuality. So and Roland assert that: "If the general class of the misclassified points to the erosion of the machine's initial binary understanding of white and black, a close analysis of a single misclassified text can reveal what precisely motivates that ontological undoing" (68). Thus they turn the what Da describes as the "fundamental mismatch between statisical tools that are used and the objects to which they are applied" into a point of interrogation (601). So and Roland emphasize that computational methods, which work to "identify and label objects," can operate in tandem with minority discourse analysis, which "critique[s] and problematize[s] the very idea of categories" (63). In this case, the algorithm allows researchers to interrogate how whiteness as a category depends on the contrast of blackness as "other." So, rather than being "fundamentally mismatched," the machine and minority discourse are particularly suited for one another, as the machine uses highly constructed and reductive method that allows practitioners to deconstruct social categories.

The example with "appalled" is totally idiosyncratic–the word occurs once through the entire novel. But paying attention to error upends the expectations of reproducibility. The researchers run a computation, look for an error, and use that error as an opportunity to learn about the ways that categories are constructed. They are using computers in an unintuitive way, computing for indeterminacy.

One prominent distant reading practitioner, Ted Underwood, studies the way that gender markers in novels change over time. Underwood uses machine learning for statistical modelling analysis, in which a sample of data is used to make predictions about larger groups of data. In other words, he uses computer programs "trained" by certain data sets, to create other programs that can then make predictions on other datasets. He then visualizes the results of his model. Underwood's goal is to explore how effective computers are at analyzing certain textual elements based on previous analyses. Highly aware of how his data can carry certain assumptions, he calls his approach "perspectival modelling." He explains that, "Since learning algorithms rely on examples rather than fixed definitions, they can be used to model the tacit assumptions shared by particular communities of production or reception" ("Machine Learning and Human Perspective" 93). In a review of Underwood's work, Dan Sinykin writes that "Against the purported objectivity of algorithms, he leverages the human prejudices built into modeling toward humanistic ends" (par. 4).[7]

[7]Sinykin, Dan. "Distant Reading and Literary Knowledge." *Post45*. May 6, 2019.

One of Underwood's projects examines gender roles in novels from the 18th century to the 21st century by using a model that predicts the the sex of a fictional character based on the words associated with that character. Underwood explains how the test is configured:

> We represent each character by the adjectives that modify them, verbs they govern and so on–excluding only words that explicitly name a gendered role like *boyhood* or *wife*. Then, we present characters, labeled with grammatical gender, to a learning algorithm. The algorithm will learn what it means to be 'masculine' or 'feminine' purely by observing what men and women actually do in stories. The model produced by the algorithm can make predictions about other characters, previously unseen. *Distant Horizons* 115

In simplest terms, the program studies some given adjectives associated with a male or female character in order to make predictions about other characters' genders. Inevitably, the resulting output is always determined by this initial input. Underwood carefully asserts that these models suggest, not the truth of gender ontology, but the approaches and choices made by those who create the models: "Machine learning algorithms are actually bad at being objective and rather good at absorbing human perspectives implicit in the evidence used to train them" ("Machine Learning and Human Perspective" 92).

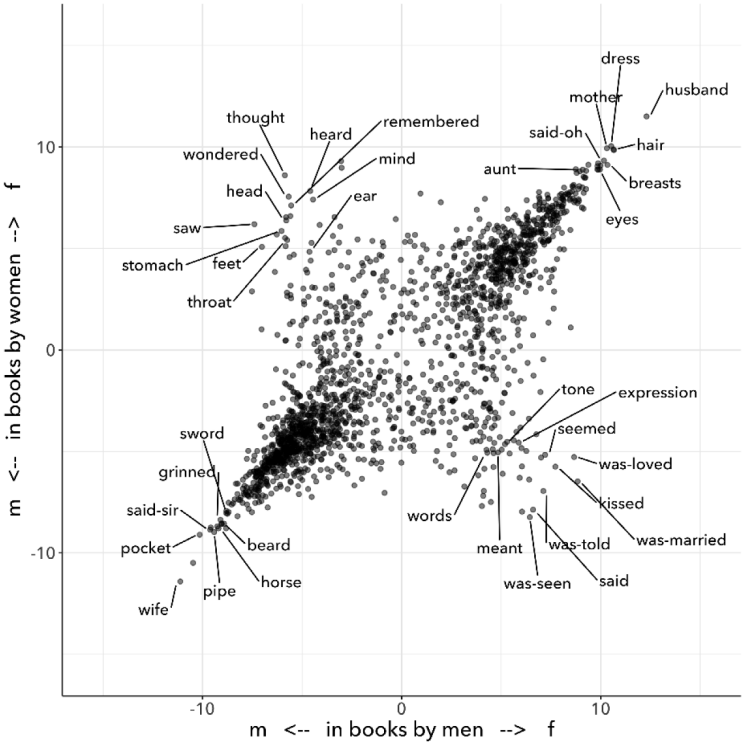
This particular model reveals that that, over time, gender roles in novels become more flexible while the actual number of female characters declines (*Distant Horizons* 114).

The graph below shows a steady overlapping of words traditionally associated with women, such as "heart," with words typically assoicated with men, like "passion," toward the middle of the 20th century.

One of the many explanations for this result, Underwood reasons, is that the practice of writing becomes more commonly pursued as a male occupation in the middle of the 20th century than it was previously (*Distant Horizons* 137). This fact, coupled with the tendency of men to write more about men than women, suggests why less women writing would led to a decline in female characters. This explains how Underwood's seemingly paradoxical conclusion, that gender roles become more flexible while the actual prevalence of women dissapates from fiction, might be possible.

NOT THIS GRAPH!

`https://post45.org/2019/05/distant-reading-and-literary-knowledge/`



There are two important things to point out about Underwood's analysis. First is that his specific method for text analysis is logistic regression analysis, which is made for modelling binary variables. A logistic regression expresses information in the form of a probability, often between yes/no, pass/fail, win/lose, etc. In Underwood's case, the probability is male/female. The output therefore conforms to this binary model. Second, underpinning his methodology, there is a larger issue with the question that Underwood poses. From a critical gender perspective, Underwood's question imposes the very structure that he is attempting to deconstruct. In other project where he similarly measures the "transformations" of gender across time periods, he explains that simplification is necessary ("Machine Learnig and Human Perspective" 93). Underwood admits that he needs a "simple" model in order to bring into relation the dynamics of gender (See Fig. 2).[8] He explains:

[8]He measures the "gendering of words used in characterization" ("Machine Learning and Human Perspective" 95), that is, gender portrayed in novels by women and in novels by men. The verticle axis visualizes the representation of words by women, and the horizontal by men, with positive numbers signifying overrepresentation of these terms. So

> I recognize that gender theorists will be frustrated by the binary structure of the diagram. To be sure, this binary has folded back on itself, in order to acknowledge that social systems look different from different positions in the system. But the diagram does still reduce the complex reality of gender identification to two public roles: men and women. I needed a simple picture, frankly, in order to explain how a quantitative model can be said to represent a perspective. "Machine Learning" 98

In aiming for simplicity, Underwood underestimates the extent to which his initial assumptions will affect the final result. Although he considers the possibility that he finds a structural tension between gender "because [he] explores gender, for the most part, as a binary opposition" (*Distant Horizons* 140), he neglects to consider how the collapsing of gender into a single graph perpetuates the structural categories of male/female and the assumptions behind such a category.[9] The issue is not just with the assumptions at the outset which reproduce the result, but with the guiding question of the entire project, which is not about deconstructing gender, but about reifying it. Asking a machine to replicate the conscription of gender as male/female for the purpose of seeing how male and female roles in novels change over time only creates a model of gender that is "simple" enough to be computed.

How does simplifying the concept of gender contribute to our study of it? Underwood's "simple" model recalls with what Eve Kosofsky Sedgwick describes as "a binary mode of thinking," which searches for what might affirm or deny the point of interrogation. Sedgwick explains that this process creates a formula for literary analysis by which reading becomes a mechanical practice of searching for what is hidden or absent which will finally explain some latent meaning in the text (Sedgwick Touching Feeling 12). Then, This process is replicated as the search for meaning takes on other texts, imposing the same structure on new material. Underwood himself states: "the data I can legally provide – lists of word frequencies associated with each volume or fictional character – should allow intrepid readers to retrace the most debatable parts of the argument. An argument that can be retraced in this manner is 'reproducible'" (Underwood, *Distant Horizons* 173). He continues, "If my conclusions hold true in different subsets of the literary past, they are not just reproducible but 'replicable'" (Underwood, *Distant*

terms on the top right are words that are used often by men and women writers, and terms in the upper left and lower right are ones used most often by women and men, respectively.

[9] Add a quote here from Laura Mandell on F/M categories?

Horizons 174).

Laura Mandell explores solutions for approaching the reduction of gender as data, into what she calls the "M/F binary."[10] Mandell demonstrates how the M/F binary is reified "by presenting conclusions about “male” and “female” modes of thinking and writing as if the M/F terms were simple pointers to an unproblematic reality, transparently referential and not discursively constituted" (par. 5). Mandell's examination marshalls key findings from feminist theory, drawing from Judith Butler, among others, to assert that gender is a socially constituted category, a "performance" that can be historicized. She illustrates the guiding power of the M/F binary in her critique of Matthew Jockers and Jan Rybicki, finding that they essentialize gender by relying on stereotypes in their premises.[11] Mandell uses stylometry, as well as word-frequency analysis, and topic modeling to examine gender in writing.[12] Topic modeling, as explained above, is the generation of categories or "topics" about text. Mandell uses the popular stylometry measurement, "Burrow's Delta," which visualizes the "distance" between writing styles by creating branches (or "deltas") between different texts. Specifically, Mandell's analysis focuses on the "most frequent, little words (“a,” “of,” “the”), as well as keywords."

Mandell suggests that quantitative methods can open up the way we deconstruct our understanding of quantification and gender. She points out that gender, which is "constructed both by the measurer and the measured," is never just about gender, but contains multiple assumptions. To demonstrate how gender is "constructed," she poses a counter experiment with genre, which finds that genre analysis cuts across the gender binary. She comapres the stylistic qualities of a female writer, Mary Wollenstonecraft, against two male writers, William Godwin and Samuel Johnson, revealing that: "Wollstonecraft's sentimental anti-Jacobin novels most resemble Godwin's sentimental anti-Jacobin novels. . . whereas her essays most resemble Johnson's

[10]Mandell, Laura. “Gender and Cultural Analytics: Finding or Making Stereotypes?” Debates in Digital Humanities 2019. Edited by Matthew K. Gold and Lauren Klein. University of Minnesota Press, 2019.

[11]Jockers, Matthew L. Macroanalysis: Digital methods and literary history. University of Illinois Press, 2013; Rybicki, Jan. “Vive la différence: Tracing the (Authorial) Gender Signal by Multivariate Analysis of Word Frequencies.” Digital Scholarship in the Humanities (2015): 1–16. doi: 10.1093/llc/fqv023.

[12]Such methods are often used in assessing authorship and authenticity, and stylometry in particular predates computing and has notable cases in English Renaissance drama and biblical texts. Generally, stylometry evaluates writing style by extracting and analysing distinctive features in text. Often used in stylometry, word-frequency analysis examines word usage to determine authorship of a text.

writings" (par. 29). Wollenstonecraft's writing resembles both male and female writing, depending on the genre. To analyze the highly constructed category of "gender," then, one must also consider genre: "separating gender from other markings (genre, era of composition) is not possible: historical time and genre are not incidental to, but constitutive of, gender" (par. 35).

Admitting the constructed nature of gender allows researchers "to experiment with new taxonomies of gender" (par. 37). Most usefuly, Mandell's work points out how the computer is ideal for drawing attention to the multiplicity of gender. The potential for complex data models potentially allows researchers to "break the strength of the signal" in the M/F binary by creating new categories, such as "'men writing as men,' 'women writing as women,' 'women writing as men,' 'men writing as women,' 'unspecified (anonymous) writing as men,'" and so on (par. 35). Moreover, her emphasis on visualization and movement inform how one might "animate numerical processes rather than fixing their results as stereotype" (par. 7). The dynamicity of computation, which allows one to run data iteratively, feeding new inputs into new results, complicates any straighforward understanding of the M/F binary. Mandell explains that "Computer screens... afford the fluid exploration of parameters and taxonomies, through which many sorts of experiments can be tested: interactive visualizations can give us not objective answers rooted in aggressively reductive oppositions, but parallax, multiple perspectives for viewing a very complex reality" (par. 38).

However enlightening Mandell's deconstructive approach, she does overlook a crucial aspect about gender–that it is highly constitutive of subjectivity. The similarities that Mandell draws between gender and genre evacuate how gender is *constitutive* of the subject. Borrowing from Butler, she argues that both gender and genre as a performance "are... highly imitable" (par. 30), and asserts that "Anyone can adopt gendered modes of behavior, just as anyone can write in genres stereotypically labeled M/F" (par.30). Here, she takes Butler's points about gender as a performance in *Gender Trouble* too literally. As Butler clarifies in her later work, performativity is a *process* which is compulsory and habitual, rather than a singular act. Crucially, Butler asserts that gender *precedes* and *constitutes* the subject and explicitly warns against the interpretation that gender is decided by the subject, to be put on and off at will like clothing. Rather, according to Butler, the subject *is produced* by gender; gender is more like a mechanism that allows the subject to emerge: "construction is neither a subject nor its act, but a process of reiteration by which both 'subjects' and 'acts' come to appear at all" (*Bodies* xviii). This is not to say that Mandell is wrong about gender being constructed, but that her assumption, that "categories such as gender

are being constructed both by the measurer and the measured" misses an important point about the way that gender constitutes subjectivity (par. 38). According to Butler, the subject only emerges as an effect of gendered performance. Therefore, to analyze gender, one might look at the ways that it constitutes and constrains subjectivity.

I emphasize gender being constitutive because this quality has a generative parallel to computation. As Mandell points out, "Computation enables complexity" (par. 36). And computation, like gender, is also highly constrained, containing rules and protocols that govern the way that text is processed and analyzed. As So and Roland demonstrate with the categories of white and black authorship, the constraints of computation help point out the bounds of social categories as a constructed phenomenoa. While the work of So and Roland is essential for bringing together quantitative and critical race discourses, it also doesn't give enough credit to the ways that *computers*, in presenting formalized schemas of race, *transform* data toward speculative ends. Additionally, however, computation might work within the fram eof speculation. This kind of work would explore the contraints of gender and computation as *enabling constraints*. As Underwood acknowledges, computational methods are well suited for speculative inquiries: "the point of numbers in social science is not to impose determinism but to acknowledge uncertainty" (Underwood, *Distant Horizons* 186). If we are going to analyze gender, we might consider how it constitutes and constrains other elements in the text.

1.3 Deformance and Performance: NLTK, Gender Trouble, Orlando

This section now turns to the programming language Python to get a closer look at how text analysis works through constraint. We will look into the material specificity of text analysis, to examine how it works, and through what processes and protocols.

Many distant reading projects use a text analysis tool called Python to do computational analysis of textual data. As a general purpose programming language, Python is applicable toward many tasks and projects, from publishing websites, to managing and analyzing large data sets (of textual and numeric data), to deep learning and artificial intelligence. The emphasis on readability in Python's code vocabulary and syntax make it a relatively straightforward programming language that is easier to pick up than other comparable languages. Most beginners can jump into the python syntax and intuit a sense of the code simply by reading it left to right. For example, an

expression called the `for loop` consists of six words over two lines, and that instructs Python to do something to each item in a group of data. In more technical terms, the `for loop` offers a mechanism for iterating (or "looping") through data, and carrying out some specified action to each peice of data. The `for loop` consists of the following expression:

for letter in "hello": print(letter)

The first line of code specificies the data (`hello`), and the second line (`print(letter)`) instructs the computer to print each letter in the word. Essentially, this loop will go through each item in the data, in this case, each letter in the word `hello`, and it will `print` or display that data.[13] The the output will appear thus:

h e l l o

These kinds of iterative computations, which are central to programming tasks, are a core component of working with text. At a very basic level, much of text analysis consists of iterating over bits of text and doing something to each bit.

A major benefit to a popular programming languages like Python is that users have developed a number of custom "libraries," or collections of code for specific tasks like web scraping, data analysis, and text analysis. In text analysis, there are a number of libraries for Natural Language Processing (NLP), or the processing of linguistic data into computational formats. The most popular NLP library in python is the Natural Language ToolKit (NLTK). This library comes packaged with a corpus of texts that are ready to analyze, like Herman Melville's *Moby Dick* (1851) and Jane Austen's *Sense and Sensibility* (1811). Researchers can use NLTK methods like `tokenize()` or `lemmatize()`, allowing them to process a text from its oringal format, often a `string`, or alphanumeric characters in sequential order, into a "clean" or regularized form. NLTK also contains useful analytical methods such `similar()`, which will generate a list of words that appear in similar contexts to the chosen word, or `concordance()`, which will return all the immediate words surrounding a chosen word. For example, below is a concordance of from Austen's *Sense and Sensibility* for the word "woman":

ties . Had he married a more amiable woman , he might have been made still more t was so much the greater , and to a woman in Mrs . Dashwood ' s situation , wi ry comfortable fortune for any young woman ." " To be sure it is ; and , indeed way , if he were to wish to marry a woman who had not either a great fortune o nd of the danger attending any young woman

[13] In JavaScript, for example, the `for loop` is more convoluted:
for (i = 0; i < word.length; i++) { text += word[i] + "
"; }

who attempted to DRAW HIM IN ; that to inhabit or visit it while such a woman was its mistress . She instantly wro income of five hundred a - year by a woman who never saved in her life , they w as she was a very cheerful agreeable woman , he hoped the young ladies would no d - humoured , merry , fat , elderly woman , who talked a great deal , seemed v should by any chance happen to be a woman who is single at seven and twenty , objection to his marrying HER ." " A woman of seven and twenty ," said Marianne y of a wife . In his marrying such a woman therefore there would be nothing uns ed Elinor , " to convince you that a woman of seven and twenty could feel for a ndignity of being approved by such a woman as Lady Middleton and Mrs . Jennings ch was exactly calculated to carry a woman . Without considering that it was no been , she had actually made her own woman enquire of Mr . Willoughby ' s groom ould be attempted . " You are a good woman ," he warmly replied . " Your promis , he was the husband of a very silly woman ,– but she knew that this kind of b all the philosophy of a well - bred woman , contenting herself with merely giv rmed at in reality ." " What a sweet woman Lady Middleton is !" said Lucy Steel , you cannot tell me what sort of a woman she is ?" " No ," returned Elinor , sible he is very capable of making a woman sincerely attached to him ." " Certa nd I fancy she is an exceeding proud woman ." " I certainly did not seek your c . Ferrars is a very headstrong proud woman , and in her first fit of anger upon self - interest alone could induce a woman to keep a man to an engagement , of

This tool allows users to examine the context surrounding the chosen word, "woman." In other words, we see some of the text that comes immediately before and after the chosen word. This `concordance` method is related in its process to another one, `similar`, which also uses word context to calculate its output. The result for running `similar` on the word "woman" in *Sense and Sensibility* are the following:

man way year moment word men letter friend person gentleman living situation part lady wife child time thing little day

To compute terms with `similar()`, NLTK first takes the context of the term from `concordance()`, then it searches the text for other terms that contain similar contexts. In this sense, the `similar()` method searches the text for words that appear *similarly* to the chosen word. It is a useful strategy for getting a sense of which words are treated in comaprable ways across the text.

In order to run methods like `concordance()` and `similar()`, however, the text needs to be ready for analysis. This requires a series of preprocessing tasks like tokenizing, cleaning and regularizing the text. Tokenizing the

text means separating it into units like words and punctuation. Tokenizing the text transforms a `string` (alphanumeric sequence) of characters into workable units, or `tokens`, which is easier to clean and regularize. NLTK offers a method for tokenizing: `nltk.word_tokenize()`. Running this method on the text of Virginia Woolf's *Orlando* turns the novel into a list of words and punctuation. The following is the first sentence of the novel in tokenized format:

['He', '–', 'for', 'there', 'could', 'be', 'no', 'doubt', 'of', 'his', 'sex', ',', 'though', 'the','fashion', 'of', 'the', 'time', 'did', 'something' 'to', 'disguise', 'it', '–', 'was', 'in','the', 'act', 'of', 'slicing', 'at', 'the', 'head', 'of', 'a', 'Moor', 'which', 'swung', 'from','the', 'rafters', '.']

Once the text is tokenized, then it can be cleaned. Cleaning the text involves stripping it of capitalized letters and punctuation, such as "–" and ",", and removing what are called "stop words," or prepositions, articles, and related terms. In this example, stop words include "he," "for," "there," "be," "of," "the," and "did." Punctuation and stop words are often removed because tend to skew or slow results of analysis due to their high frequency and low semantic value. Using python's brevity, we can clean and remove punctuation and capital letters with just one line of code:

$\text{lower}_{\text{nopunct}}$ = [word.lower() for word in tokens if word.isalpha()]

Reading from left to right, this expression first creates an empty list, called `lower_no_punct`. Then, for each word in the text, it makes the word entirely lowercase, and if that word is alphabetic (meaning it contains no numbers or punctuation), it will be added to the empty list. Python expressions like this one, which are contained within brackets on a single line, are called "list comprehensions." The variable that stores the final data (`lower_no_punct`) is set to a list comprehension that specifies what to do for each word in the text. This expression is a kind of condensed loop, which goes through each item in a list of items (such as each word in a text) and does something to that item. The same expression can be written in expanded form by making use of nested structures. For example:

$\text{lower}_{\text{nopunct}}$ = [] for word in tokens: if word.isalpha(): $\text{lower}_{\text{nopunct.append}}$(word.lower())

Here, we begin again by creating an empty list, `lower_no_punct`, into which we will drop our words after filtering through them. The next line begins our `for loop`, which iterates through each word in the `tokens` list of words. The third line creates the condition to have only alphabetic characters in our `lower_no_punct` list. If the word passes that condition, then we go to the fourth line, which will add that word to the list. At the same time that this word is added to this list, all the letters will be transformed to lowercase

format. The final list will contain words that are all lowercase and contain no punctuation.

Next, we will remove stop words. To do this, we can use another list comprehension:

no_{stops} = [word for word in $\text{lower}_{\text{nopunct}}$ if word not in stops]

Similarly to the above example, this expression takes each word in a list, in this case, `lower_no_punct`, and checks to see if that word is also contained within the list of stop words in `stops`. If the word is *not* a stop word, then it will be added to a new list, `no_stops`. Once this is done, we can take a peek into the first several words on the cleaned text. We are now left with a list of words that are all lowercase, without punctuation or stop words:

['could', 'doubt', 'sex', 'though', 'fashion', 'time', 'something', 'disguise', 'act', 'slicing','head', 'moor', 'swung', 'rafters']

After cleaning the text in this way, we can move on to regularization, which includes lemmatizing. Lematizing is the process of stripping the grammatical structure to get the word root. In some cases, this involves cutting off the endings, or affixes, from the word, for example, "rafters" will be stripped to "rafter." In other cases, however, it involves looking up a word in a reference to find the appropriate root. After running the lemmatizer through our text, the first sentence appears thus:

['could', 'doubt', 'sex', 'though', 'fashion', 'time', 'something', 'disguise', 'act', 'slicing','head', 'moor', 'swung', 'rafter']

There are two aspects about the cleaning and regularizing process that merit some attention: the first is recursion. The cleaning and regularizing process is highly recursive, doing the same action to each item to the list of words that make up the text. The logic of the code reinforces this recursiveness, especially in the loop which iterates through items in a list, doing the same thing to each item, one by one. Additionally, the code's nested expressions reinforce recursion, as each line specifies another action to be performed on each word. For example, in the following code block, the first line isolates a word from the list, the second line checks if that word contains only alphabetic characters, and the third transforms that word to lowercase. Each of the three lines performs an additional task on the same word.

for word in tokens: if word.isalpha(): word.lower()

The second notable aspect about the cleaning and regularizing process is reduction. These tasks of preprosessing text force words into existing boxes, so to speak, in order to make them amenable to analysis. The effect of this preprocessing therefore strips text of some of its semantic meaning, which can be contained in capitalized words, rhythms of language in stop words,

inflections in word endings, and so on. That preprocessing potentially strips meaning from words doesn't mean that it ought to be avoided, but that the researcher ought to be aware of how certain textual reductions have the potential to affect meaning. For example, the novel *Orlando* opens with this assertive gender designation, followed by an immediate qualification of this designation, which is expressed entirely in stopwords and punctuation. The removal of stopwords from the opening sentence strips the immensely meaningful first word "He," which asserts the gender of the protagonist. It also cuts the following em dash, which leads to an interruption that immediately qualifies the previous assertion "–for there could be no doubt of his sex–." In preprocessing, such details would be read as semantically void and would be subsequently removed from the data.

1.3.1 constraint of gender: queer performantivity

These critics all approach the interaction between reader and text as a peformative phenomenon. They discuss the event of the analysis, "playing the text", making "cuts" into the data. By contrast, the aspect of performativity that gender theorists like Judith Butler emphasize is that of repetition, signification, and re-signification. Butler performativity as a repetitive activity, constrained by regulatory norms, which produces subjects. Although performativity regulates subjects toward heteronormative practices, it can also be coopted into subversion. In the process of repetition, subjects have the possibility of resignifying meaning by producing it differently. This resignification allows subjects to work within their limitations to resist dominant structures while maintaining their own sense of exclusion without being coopted. In other words, they can be in the system but not of the system.

In her groundbreaking book, *Gender Trouble: Feminism and the Subversion of Identity* (1990), Judith Butler famously disrupts popular theorizations about sex and gender in contemporary feminist thought: namely, that sex is biological while gender is constructed; and that the gender, as a construction, is a self-expression of the subject. According to Butler, sex and gender are both social constructions, and there is no such thing as a stable gender identity, or even a subject that exists prior to gender expression. Rather, Butler argues that gender is performative–it is a series of repeated acts by which the subject enacts gender by "citing" heteronormative regulatory schemas. It is through the process of enacting gender that the subject emerges. In her follow up book, *Bodies That Matter* (1995), Butler further delineates the process of gender performativity, where what is experienced as the physical body, its boundaries and its sexuality, only materialize through

the repetition or “citation” of cultural norms. Her concept of "citation" emphasizes the iterability of the performative practice, whereby each action "cites" or implicitly signals an authorizing norm. According to Butler, performance consists of this habit of citation, the ongoing process of submitting behavior to a regulatory norm.

Here, Butler's central concern is to explore how language and the body engage. Specifically, Butler wonders whether language can indicate a body that has not yet been imbued with meaning, a body "prior to signification" (6). She wonders, "Can language simply refer to materiality, or is language also the very condition under which materiality may be said to appear?" (6). Butler finds that language cannot refer to a pre-existing materiality– for to refer to the body, language must first posit that body, and in the positing, it assumes meaning. Therefore, she reason, the signification of the body actually creates the body: "This signification produces as an *effect* of its own procedure the very body that it nevertheless and simultaneously claims to discover as that which *precedes* its own action" (6). Language, rather than reflect a prior reality, actually works to *produce* signification. Butler's point here draws from feminst theorist Luce Irigaray who argues that language in fact creates knowledge, as in her famous statement about female sexuality, which "has always been conceptualized on the basis of masculine parameters" (Irigaray, *The Sex Which Is Not One* 23). Butler points out that "the mimetic or representational status of language.... is not mimetic at all. On the contrary, it is productive, constitutive, one might even argue performative" (6). In other words, language produces the reality that it claims to merely reference. So, in the process of citation, which is the ongoing re-signification that cites regulatory norms such as gender norms, subjects are always interpellated by a discourse prior to their citing it. This productive quality of language will be central to the ways that language offers a way out of the significatory circle.

Butler asks, "What would it mean to cite a law to produce it differently, to 'cite' the law in order to reiterate and coopt its power?" (xxiii). For, amid this regulatory structure, in which the subject comes into being by continually citing the norm, lies the possibility of resignifying that citation. Because language transcends a representative function, because it has the ability to *produce* meaning, language can be resignified toward subversive usages by *citing the repudiated signification.* Butler offers an example in the resignification of the term "queer," which has been transformed from a term of abjection to one of empowerment. "Queer" achieves this signification by harnessing its own repudiation, which Butler explains is implied by every identification, a "disavowed abjection [which] will threaten to expose the

self-grounding presumptions of the sexed subject" (3). By identifying with heterosexuality, one repudiates homosexuality, the "Queer," which will remain as a threat to the identification. Butler proposes that one marshall this repudiation as a resource in resignification: "to consider this threat and disruption... as a critical resource in the struggle to articulate the very terms of symbolic legitimacy and intelligibility" (3). Here, the concept of "citation" is crucial, for each signification "cites" or draws from the authorizing power. One can cite a norm in order to disrupt the significatory power of that norm. So, the term "queer," in its public assertion, "enacts performativity as citationality for the purposes of resignifying the abjection of homosexuality into defiance and legitimacy" (xxviii). Each time the term is used, it draws from the domain of abjection, the repudiation, in a way that re-signifies because it fails to repeat the meaning loyally, because it signifies that meaning differently. For Butler, then, the central problem of being stuck in the cycle of signification is also the solution. Butler takes on language as something that can be productive, that can resignify meaning, as the option available to those who are trapped within the signification system.

An exploration of Luce Irigaray's writing style demonstrates how this process of resignification can take place in language. First, Butler establishes how significatory systems exclude that which they claim to signify. Irigaray takes Jacques Derrida's concept of phallogocentrism, or that man, symbolized by the phallus, is the center and focus of knowledge, as a lens for reading Plato and Aristotle's discussion of form/matter or bodies/souls binaries. Irigaray demonstrates how these binaries, which take the category of "woman," associated with "matter" (materiality, the mother) and set it subordinate to male "form" (mastering rationality) actually erase the possibility of representing woman at all. In fact, the binary that claims to represent the feminine as the subordinated term in masculine/feminine binaries, actually "produces the feminine as that which must be excluded for that economy to operate" (10). Because "binary oppositions are formulated through the exclusion of a field of disruptive possibilities"(10), the feminine is "domesticated" (13). The nonfigured feminine remains excessive, outside the terms of the binary:

> One cannot interpret the philosophical relation to the feminine through the figures that philosophy provides, but, rather, she argues, through siting the feminine as the unspeakable condition of figuration, as that which, in fact, can never be figured within the terms of philosophy proper, but whose exclusion from that propriety is its enabling condition. 12

What Butler calls the *excessive* feminine is excluded, or cast out, as "the

necessary outside," which allows the *specular* feminine to take its place in the binary. According to Butler, we cannot know what the feminine consists of without subscribing it to phallogocentrism. If the feminine is outside the system, and cannot be figured, how can it be known? Butler aptly questions, "For how can one read a text for what does *not* appear within its own terms, but which nevertheless constitutes the illegible conditions of its own legibility?" (11). For Butler, this is the key question–how do we work with what we are given to express what is not there, what is refused by the system of the visible?

The answer is through repetition and reworking–resignification through performative citation. Butler explains that Irigaray achieves this resignification by miming language: "she mimes philosophy... and, in the mime, takes on a language that effectively cannot belong to her" (12). Butler reads Irigaray's use citation as a strategy of repeating what Plato says with the goal of undermining his authority: "She cites Plato again and again, but the citations expose precisely what is excluded from them, and seek to show and to reintroduce the excluded into the system itself" (18). Through repetition, Irigaray displaces the logic of phallogocentrism, introducing something external to the system while remaining within its terminology. Butler affirms that "Her miming has the effect of repeating the origin only to displace that origin as an origin" (18). Her repetition is a way of infiltrating the logic of phallogocentrism on its own terms. Butler herself mimes what might have been Irigaray's internal monologue:

> I will not be a poor copy in your system, but I will resemble you nevertheless by miming the textual passages through which you construct your system and showing that what cannot enter it is already inside it (as its necessary outside), and I will mime and repeat the gestures of your operation until this emergence of the outside within the system calls into question its systematic closure and its pretension to be self-grounding" (18).

Deception through resemblance; insubordination through subservience; displacement through repetition–these are the tools available to the subject that remains outside the logic of phallogocentrism.

1.3.2 orlando close reading - gender as enabling constraint

As I previously examined NLTK for how it guides and constrains analysis, I now turn to looking at *gender as a constraint* in Virginia Woolf's novel, *Orlando: A Biography*. In what follows, I will demonstrate how gender

functions as an *enabling constraint* in Virginia Woolf's text, *Orlando: A Biography*, to examine how the phenomenon of gender guides and influences subjectivity.

Orlando is a fictional biography that follows the life of the eponymous 16th-century English nobleman as he undergoes a sex change and lives into the 20th century as a woman. In this text, gender is linked to the role of language in the way that they both activate significatory power. My reading explores how the beginning of the novel displays the common struggle between gender and language for for expression. I then point out key moments where the novel approaches gender through the prism of language, specifically in the tension between plain language and poetic language as experienced by Orlando as he develops into a poet and by the biographer-narrator, who repeatedly disclaims literary and figurative strategies of narration while striving for an objective portrayal of Orlando's life. Then, I show how Orlando's sex change begins to resolve his struggle with language, and therefore, gender. As Orlando settles into her new gender, she finds new significatory power in language. At the same time, the biographer is freed to explore more experimental forms for telling Orlando's story.

At the beginning of the story, Orlando falls in love with a young Russian princess named Sasha. The scene of this romance is an important moment where gender is explored in relation to language, because Orlando cannot resolve either one. When he first sees Sasha, she is skating over the frozen river Thames, and he cannot ascertain if she is a man or a woman from her skilled atheleticism and exotic manner of dress. He proceeds to describe her using seemingly arbitrary metaphors–another significatory attempt that also fails:

> He beheld, coming from the pavilion of the Muscovite Embassy, a figure, which, whether boy's or woman's, for the loose tunic and trousers of the Russian fashion served to disguise the sex, filled him with the highest curiosity. The person, whatever the name or sex, was about middle height, very slenderly fashioned, and dressed entirely in oyster-coloured velvet, trimmed with some unfamiliar greenish-coloured fur. But these details were obscured by the extraordinary seductiveness which issued from the whole person. Images, metaphors of the most extreme and extravagant twined and twisted in his mind. He called her a melon, a pineapple, an olive tree, an emerald, and a fox in the snow all in the space of three seconds; he did not know whether he had heard her, tasted her, seen her, or all three together. (For though we must pause

> not a moment in the narrative we may here hastily note that all his images at this time were simple in the extreme to match his senses and were mostly taken from things he had liked the taste of as a boy. But if his senses were simple they were at the same time extremely strong. To pause therefore and seek the reasons of things is out of the question.)... A melon, an emerald, a fox in the snow–so he raved, so he stared. When the boy, for alas, a boy it must be–no woman could skate with such speed and vigour–swept almost on tiptoe past him, Orlando was ready to tear his hair with vexation that the person was of his own sex, and thus all embraces were out of the question.

This passage expresses a mounting sense of tension as Orlando grows more and more frustrated with Sasha's gender ambiguity. Interestingly, his growing frustration seems to feed his attraction, as with each doubt Orlando appears more and more desperate, "ready to tear his hair with vexation." The biographer's role in the narrative unfolding of this scene also has an effect: the syntax alternates long and short sentences in a way that draws out the cyclical quality of Orlando's confused mental state. There is also a "pause" in the action, where the biographer adds another layer of speculation to Orlando's already conflicted inner life, while simultaneously drawing attention to the constructed quality of the narrative. While the tension is mounting throughout the passage, the relationship between gender and language come to the fore. The biographer's aside, which describes how the difficulty of placing gender emerges in the difficulty with language– "He called her a melon, a pineapple, an olive tree, an emerald"–emphasizes the connection between gender and the imagination. Intrestingly, at the same time that Orlando cannot place Sasha's gender, he also cannot find the right words to describe her. As the Sasha's probable gender oscillates between male and female throughout passage, and Orlando's desire crescendos, gender seems primed to signify imaginative beyond biological species, nevermind sex. The effect of the narrative style in this section is to mirror with language the tortuous thought process that Orlando undergoes as he guesses then doubts the reality of Sasha's gender. As the passage continues, the suspense comes to a climax:

> But the skater came closer. Legs, hands, carriage, were a boy's, but no boy ever had a mouth like that; no boy had those breasts; no boy had eyes which looked as if they had been fished from the bottom of the sea. Finally, coming to a stop and sweeping a curtsey with the utmost grace to the King, who was shuffling past on the arm of some Lord-in-waiting, the unknown skater

> came to a standstill. She was not a handsbreadth off. She was a woman. 27-28

Again, this narrative structure reinforces Orlando's ambivalence about Sasha's gender ambiguity. The sentences ebb and flow as Orlando finally settles on Sasha's gender–"she was a woman." Gender is an element that functions within the story, as something that Orlando struggles to grasp, in this case, with language. The biographer's narrative style here, which depicts Orlando's struggle with gender via langauge, add another layer of language experimentation in the form of his narrative style. This scene scene shows how if gender is ambiguous, then language is also imprecise.

As Orlando's relationship with Sasha ends with deceit and desertion, he succumbs to a long, deep depression that brings him to doubt both what he had previously been most moved by: love and poetry–"Thys, at the age of thirty, or thereabouts, this young Nobleman had not only had every experience that life has to offer, but had seen the worthlessness of them all. Love and ambition, women and poets were all equally vain. Literature was a farce" (71). At this time, Orlando begins to doubt language's ability to convey truth. In one scene, he struggles both with objective or "plain" language, and with poetic language, by attempting to describe the color of the grass and the sky:

> 'The sky is blue,' he said, 'the grass is green.' Looking up, he saw that, on the contrary, the sky is like the veils which a thousand Madonnas have let fall from their hair; and the grass fleets and darkens like a flight of girls fleeing the embraces of hairy satyrs from enchanted woods. 'Upon my word,' he said (for he had fallen into the bad habit of speaking aloud), 'I don't see that one's more true than another. Both are utterly false.' And he despaired of being able to solve the problem of what poetry is and what truth is and fell into a deep dejection. 75

Orlando cannot comprehend whether plain english, where he can say simply that "the sky is blue; the grass is green" is preferable to a more figurative language, which makes use of similitude and allusion: "the sky is like the veils which a thousand Madonnas have let fall from their hair; the grass fleets and darkens like a flight of girls fleeing the embraces of hairy satyrs from enchanted woods". For Orlando, both plain and figurative language appear deficient. At this point in the story, he has lost his faith in the power of language to signify.

The struggle with language operates at two levels across the story: At the same time that Orlando has his doubts about language, so the biographer

grapples with his narrative project. At the start of the story, the biographer mocks the techniques of historical biographers by continualling calling into question the ability of language to adequately describe life. An early passage begins with the narrator noting Orlando's exquisite beauty: "A more candid, sullen face it would be impossible to find. Happy the mother who bears, happier still the biographer who records the life of such a one! Never need she vex herself, nor he invoke the help of novelist or poet" (12). From the beginning, the text displays the biographer's ambivalence about how to describe Orlando and presents two possible perspectives–that of the poet, and that of the biographer.The biographer asserts his aims are to record Orlando as a scribe, "following after" him, "from deed to deed, from glory to glory, from office to office" (12). But then, as the passage progresses, the narrator relies on figuration:

> The red of the cheeks was covered with peach down; the down on the lips was only a little thicker than the down on the cheeks. The lips themselves were short and slightly drawn back over teeth of an exquisite and almond whiteness. Nothing disturbed the arrowy nose in its short, tense flight; the hair was dark, the ears small, and fitted closely to the head. But [..] directly we glance at Orlando standing by the window, we must admit that he had eyes like drenched violets, so large that the water seemed to have brimmed in them and widened them; and a brow like the swelling of a marble dome pressed between the two blank medallions which were his temples. Directly we glance at eyes and forehead, thus do we rhapsodize. Directly we glance at eyes and forehead, we have to admit a thousand disagreeables which it is the aim of every good biographer to ignore. 12-13

Honoring his committment for straightforward narration, the description of Orlando's face begins soberly enough with simple sentence structure that describe Orlando's features with some insertion of modest figurative comparisons (the "peach down" ob the lips, teeth of "an exquisite and almond whiteness," the "tense flight" of the "arrowy nose," etc). However, when the biographer arrives to Orlando's eyes and forehead, his style ascends into full-fledged figuration, admitting Orlando has eyes "like drench'd violets." The biographer's problem, that Orlando is too beautiful for literal description requires him to draw on the strategies of the poet, using imagery and simile. Further in the story, in the chapter of Orlando's sex change, the biographer again falls back onto poetic strategies to tell Orlando's story. The biographer begins this chapter by laying out the challenge of describing Orlando's life in a way

that is objective and literal, in keeping with the principles of biography. As he tries to piece together the events of Orlando's sex change, the biographer explains that the record of Orlando's life during this period is incomplete, because a fire broke out and destroyed much of the evidence: "Just when we thought to elucidate a secret that has puzzled historians for a hundred years, there was a hole in the manuscript big enough to put your finger through... often it has been necessary to speculate, to surmise, and even to use the imagination" (88). The biographer explains that he must work from fragments, and that his work involves the use of speculation, much like a

Orlando's relationship to language begins to change as she transitions from male to female. The relationship to language begins with the narrator, who is the first to assert the change in gender pronouns:

> We may take advantage of this pause in the narrative to make certain statements. Orlando had become a woman–there is no denying it. Bu tin every other respect, Orlando remained precisely as he had been. The change of sex, though it altered their future, did nothing whatever to alter their identity. Their faces remained, as their portraits prove, practically the same. His memory–but in future, we must for convention's sake, say 'her' for 'his;' and 'she' for 'he'–her memory then, went back through all the events of her past life without encountering any obstacle. 102-103

Here, the narrator cycles through the pronouns "he," "they," "she," in a way that shows how language lags behind gender. The biographer's language is catching up to the reality of Orlando's new gender. This is an example, quite literal, of how language struggles to represent gender, how it is just behind the expression of gender.

After the sex change, Orlando meets and marries a gender ambiguous man named Shel. As Orlando falls in love with Shel, her issues with language begin to resolve. She has an experience where language suddenly takes on significatory power. In a scene that revises a prior one of the young, heartbroken Orlando attempting to describe the color of the sky and the grass, Orlando is now in Hyde Park, watching a toy boat negotiate a wavelet on the Serpentine river. Momentarily, the boat is dissapears then re-emerges on the other side of the wavelet. Suddenly associating this moment with the word "ecstasy," Orlando hurries to telegram the phrase, 'a toy boat on the serpentine' and 'ecstasy,' to Shel, who she knows will immediately understand what it means. As she goes to the post office, she meditates

on the nature of language and literature, which she now realizes is violently ecstatic.

> 'A toy boat, a toy boat, a toy boat,' she repeated, thus enforcing upon herself the fact that it is not articles by Nick Greene on John Donne nor eight-hour bills nor covenants nor factory acts that matter; it's something useless, sudden, violent; something that costs a life; red, blue, purple; a spirit; a splash; like those hyacinths (she was passing a fine bed of them); free from taint, dependence, soilure of humanity or care for one's kind; something rash, ridiculous, like my hyacinth, husband I mean, Bonthrop: that's what it is–a toy boat on the Serpentine, ecstasy–it's ecstasy that matters.

Unlike the grass and sky from the previous scene, language now has the power to signify. "A toy boat" and "ecstasy" are reduced to the same meaning, a common denominator of feeling. This reduction elevates the potential for language to capture and convey meaning. The symmetry of these two episodes shows how Orlando moves beyond a disappointment in the limitations of language for expression to a new faith in its power to mean.

As Orlando resolves her struggle with language, so does the biographer. As the story progresses, the biographer increasingly drops his pretension toward accuracy and boldly speculates, without excuses, elements of the story. At one point, when Orlando first meets her lover Shel, the biographer draws the reader into this speculation. Shel is a ship captain who exhibits as many feminine qualities as Orlando does masculine. The biographer describes a scene of their early courtship:

> 'Shel, my darling,' she began again, 'tell me...' and so they talked two hours or more, perhaps about Cape Horn, perhaps not, and really it would profit little to write down what they said, for they knew each other so well that they could say anything, which is tantamount to saying nothing, or saying such stupid, prosy things as how to cook an omelette, or where to buy the best boots in London, things which have no lustre taken from their setting, yet are positively of amazing beauty within it. For it has come about, by the wise economy of nature, that our modern spirit can almost dispense with language; the commonest expressions do, since no expressions do; hence the most ordinary conversation is often the most poetic, and the most poetic is precisely that which cannot be written down. For which reasons we leave a

> great blank here, which must be taken to indicate that the space is filled to repletion.

The biographer here explains that, though it was actually beautiful and poetic when it took place, this conversation would come across as extremely ordinary and boring to the reader. An ordinary conversation can be poetic at the moment of expression, delivered or said in a way that is beautiful, which may then lose in language. The reader then encounters a space break which the biographer instructs her to imagine is "filled to repletion." This space break recalls the episode with the manuscript, where the biographer points out that there are holes or gaps in the record. However, while previously there was a problem with evidence, now it is a problem with language. According to the biographer, the means to express this conversation doesn't exist in language. As a result, the biographer invites the reader to fill in the space. To use speculation and guesses as to what happened. The reader must do what the biographer did when he confronted the lack of evidence, which was to guess what happens from the available evidence.

In troubling the line between objective reality and subjective experience, Woolf's parodic biography explores how language and gender are similarly (and coordinately) constructed. This development in language both within the story and on the level of narration is coordinated with Orlando's gender development. Comparing the biographer and Orlando's experiences with language surface an interesting insight: language and gender are connected because they both contain significatory power. While earlier in the novel, Orlando cannot express the meaning of "blue" and "green," she resolves the significatory power in the phrase "toy boat." At the same time, at the level of narrative perspective, the biographer also resolves his issue with a lack of evidence in the space break that breaks open language's ability to mean. Language and gender are connected by using the imagination in creating significatory power, constructing meaning. The difficulty with language that Orlando and the biographer both experience becomes less and less of an issue as Orlando comes into her femininity, which is to say, becomes comfortable in herself. These changes are possible because the narrative embraces the influence of the imaginary in language, in minding meaning in words and in storytelling. This allows Orlando to accept the role of the imagination in gender, in making gender meaningful.

Later in this chapter, I will use text analysis to further explore the relationship between these themes: language, gender, and the imagination. So the question then becomes: how are language and gender co-constructed in Orlando? What is the role of the imagination in gender/language? What

is the relation between gender, language, and the imagination?

1.4 TODO Queer Distant Reading

A method of distant reading attends to gender as an iterative practice. We find ever expanding ways that gender is characterized in *Orlando*.

1.4.1 reproducibility vs iteration

This notion of iteration–which cuts across both text analysis methods with NLTK and Butler's theory of gender performativity–is the key for understanding how a repetitive action can lead to new output. In my previous discussion of reproducibility, I explain how Underwood's analysis on gender differences reproduces his assumptions about gender dynamics as oppositional, as he readily admits: "this chapter has discovered stable 'structural positions' only because it explores gender, for the most part, as a binary opposition" (*Distant Horizons* 140). The the binary structure, which is inherent to linear regression models, reproduces itself the initial assumptions in the result. Because reproducibility aims for what Underwood describes as a "simple picture," it collapses or flattens the complexity of data, in this case, gender, into workable units ("Machine Learning" 98). By shifting the understanding of reproducibility to iteration, we open up the possibility for using these tools to interpret elements of gender and sexuality in text.

1.4.2 bode and butler parallel on productivity in iteration

Iteration departs from reproducibility because iteration self-consciously harnesses the productive qualities of reproducibility. We begin to see this in the way that Bode describes her critical approach, "agential realism," which mirrors Butler's explanation of gender performativity. Bode describes two approaches for literary criticism, the "representationalist" approach (in which data represents or expresses real objects and subjects in the world) and the another approach understands data "as part of the ongoing materialisation of literary texts, as emerging events always arising from an altering how the literary past as reconfigured" (Bode "Computational Modeling: From Data Representation to Performative Materiality"). Similarly, Butler distinguishes a representationalist approach toward language and materiality, in which language can *refer* to materiality as something that is prior, against the performative approach, by which language works through repetition to signify and resignify meaning:

> If the body signified as prior to signifiation is an effect of signification, then the mimetic or representational status of language, which claims that signs follow bodies as their necessary mirrors, is not mimetic at all. On the contrary, it is productive, constitutive, one might even argue performative, inasmuch as this signifying act delimits and contours the body that it then claims to find prior to any and all signifcation. Butler 6

The alignment here between Bode and Butler indicates an intersection between the digital and gender as processes, which center on the role of iteration in conveying meaning. There is something fundamentally productive about these phenomena, and not in the way that they purport to represent some real quality or object in the world. Rather, the productive aspect has to do with how they iterate their material over and again in ways that are fundamentally creative.

1.4.3 $\text{similar}_{\text{words}}$("woman" & "man")

In what follows, I will use the python text analysis library NLTK to analyze gender in Woolf's novel, *Orlando*. Specifically, I will explore the words associated with "woman" and "man" across this text, toward the goal of making a kind of "model" for gender performativity in *Orlando*. Thinking back to my close reading of *Orlando*, I found that the way that gender works is closely tied to the way that language works–Orlando and the biographer conflate the difficulty of expressing gender to that of telling a story, or writing a poem, thoughout the text. There is something about gender and language which is highly constrained, as both Orlando and the narrator are oppressed by them, but also highly imaginative, eventually allowing both subjects the potential for signification. Therefore, I will begin my text analysis by exploring how the terms "woman" and "man" are characterize in the novel. The computational process that I use will draw from Butler's theory of performativity by "resignifying" the terms "woman" and "man" in repeated computations. The final output will present a series of terms associated with man and woman after various reiterative computations of the terms throughout the text.

We begin by running the `similar_words()` method from the nltk.text.ContextIndex class, which functions very nearly like the `Text.similar()` method described previously. This `similar_words()` method takes a word, such as "woman," and returns the top words that appear most similarly to that word in the text. Below is the definition of the ContextIndex class from the NLTK source code:

class ContextIndex(object): """ A bidirectional index between words and their 'contexts' in a text. The context of a word is usually defined to be the words that occur in a fixed window around the word; but other definitions may also be used by providing a custom context function. """

The NLTK documentation explains that similarity is computed by processing the words that directly surround the given word, or its "context," and finding other words that have similar contexts. In the source code for the `similar_words()` method, there is an `if loop` that instructs the program to search if the words in the context also are associated with other words throughout the text. It then returns a list of the 20 most frequent terms which have similar contexts to the given word.[14]

Below is the output for the words, "woman" and "man," respectively:

> $\text{similar}_{\text{words}}$("woman") 'reached till friend word moment saw always could cried sailor wit scarcely petticoat go servant conclusion'

> $\text{similar}_{\text{words}}$("man") 'hurry father window tongue carriage still even countrywoman indulged old fortune title ship writing fell become always love grown never'

1.4.4 iterating over code resignifies it

Each time a text is processed in computation, it is submitted to a governing code. In this case of the `similar_words()` method, the code reduces the text to whatever conditions are contained within the function loop. The output therefore is directly constrained to the conditions in the input. Each time one feeds the output of our computation to a new one, running `similar_words()` method again, they gain an even more refined list of words that are associated with "woman" and "man." Below are the results of running `similar_words()` taking the output of the previous run of `similar_words("woman")` as the new input:

'come friend scarcely make happiness could say wisdom used thing grown love shape dog wit saw always explain understood ran time prophet indeed word stood met laughing sailor none able mixture allied woman fly way year bird might known man toss sake thought reached cried leave till account first petticoat fool would roused encumbrance become window rust another madam london'

And the output for `similar_words("man")`, running it a second time:

[14] NLTK.text.ContextIndex `https://github.com/nltk/nltk/blob/develop/nltk/text.py`

'title come need fault carriage tongue fortune death hungry passion gloomy grown love written still must always saw exactly alone almost perhaps take word matter determined orlando beautiful hear hurry woman boy plump sens man soon little morning full strength whose two father monstrously without ever would roused kinsman admit become old window sink moment'

One may continue to run this `similar_words()` analysis, feeding the output as new input, to get an ever expanding sense of words which are associated with gender. This would be interesting, as the repertoire for "woman" and "man" would swell to significations that elude the gender as a binary. Eventually, however, the repertoire would include more and more shared terms between the two genders. To avoid what would inevitably be a merging of words associated with each gender, we can slightly change the input before running the computation again. We will filter out any words that were shared between the categories of "woman" and "man". This will allow us to get a better sense of gender *distinction* in the text.

Filtering out shared words, and placed unique, similar words for "man" and for "woman" into a new list, we can run `similar_words()` again. For `similar_words()` on the words associated with "woman," we get the following *unique* words:

'among slipping launched child beneath shape new gently prophet indeed true knee denied fasten bird hot found finger person bred leave nail reflection character hid used month profit green since ran spoke omit standing prayer bald frequent good heard scramble try bethink burst ring street none may happiness wisdom let draw sawings top summer day upstairs went ribbon known catching case thought ask flung fool voyage observed minute able people come ala raising gave laughing looked third side allied fly might slept suddenly thousand going blackness groping rust sag london'

For "man," we get:

'certain need fault wicket agitate hungry long passion talk circle ague whatever written turn said explain treachery husband beast remembered sleep longer pared filled tell princess deep beard tied beautiful hear put mixture profound fumbled inborn rout immovable plump awkwardness sens sofa whole mind morning imagine toss many made iron blush round set whose raised first part monstrously without needing taste story boyish admitted longed insisted looking glance pushing'

By filtering out shared words between "woman" and "man," we come closer to modelling gender distinctiveness in this text. To be clear, gender in this sense descends from a binary system–from the initial analysis of "woman" and "man." However, from this initial binarization, it leads to a plurality of significations.

This kind of iterative analysis, where the data is being adjusted to increase the distinctiveness and complexity of the output, works toward *resignifying* the initial understanding of "woman" and "man." It takes what Butler says about gender being an iterative performance, which is continually "citing" the regulatory norm, and submits this performance to the highly iterative process of running text through computational analysis.

Like gender subversion, this kind of computational analysis works through strict protocols of repetition and iteration toward some kind of disruptive end goal. As Alexander Galloway affirms, "Protocol is synonymous with possibility" (167). Galloway here is discussing network theory, and by "protocol," he refers specifically to the codes that append data which mades connections possible in a network. Like gender performativity, networks are constrained by protocols, which enable and structure connections between nodes. Despite the restrictions of protocol, however, there is a freedom in the possibility of connection, where each node is free to connect to another within the system.[15] Similarly to hackers in a network, Butler's idea of gender subversion is is looking for the "exploit," the way to disrupt the system by using the system's own rules. The key to Butler's exploit is the iterative nature of gender performativity, which can be used to repeat and resignify meaning.

> The compulsion to repeat an injury is not necessarily the compulsion to repeat the injury in the same way or to stay fully within the traumatic orbit of that injury. The force of repetition in language may be the paradoxical condition by which a certain agency—not linked to a fiction of the ego as master of circumstance—is derived from the impossibility of choice. 83

Butler explains that the repetition of language is what enables a certain agency to emerge in repetition. Repetition is the means by which dominant or established meaning can be resignified.

1.4.5 TODO Findings: new configurations of gender

`https://github.com/rafadavis/intro_net_analysis/blob/master/1_intro.md`

[Visualization of gender distinctiveness in *Orlando* using the python networkx module]

This [forthcoming!] model of gender distinctiveness in *Orlando* draws from the same principles as Pamela Caughie et al. in their work in visualizing

[15] Chun, Wendy, *Control and Freedom: Power and Paranoia in the Age of Fiber Optics*, 2006. Print.

gender ontology in *Man Into Woman* (1931), the life narrative of Lili Elbe, one of the first persons to undergo gender affirmation surgery. As Caughie and her team struggle to mark gender shifts throughout the text in a way that accords with the constraints of the archival methodology, they wonder whether computational models can capture such taxonomic chaos of gender ontology. However, they ultimately find that the issue with categorizing gender doesn't need a solution. Rather, it needs a way of showing gender dynamicity while still being readable. The scholars point out that the issue with ontology *should* remain unresolved: "Confusion in gender and sexual terminologies... is part of the experienceof gender and sexuality in the modernist era, something to be realized and negotiated in readings of the narrative" (239). Thus they ended up creating a "storm cloud" of gender, showing clusters of different gender traits in the text over time.

1.4.6 TODO the constraint: the power of the imagination

In my previous close reading of *Orlando*, I found that gender is linked to the role of language in the way that they both are highly constructed phenomena that activate significatory power. After exploring the ways that gender and language are coordinately constructed in the novel, I was left with a question about the role of the imagination in influencing gender and language. This text analysis of Orlando attempts to bear out the implications of this question, to explore how the imaginative use of language, represented in the ever expanding networks of gender signification, troubles the idea of gender as a binary system. The process of running the gender terms "woman" and "man" reveals how even a constrained process of repeated computations can help to complicate or diversify the data, rather than simplify or reduce it. This notion of displacement through repetition is applied back to text analysis to illustrate how the iterative process of analyzing text can surface new textual structures that re-signify certain elements of that text.

[incorporate scholarship of Orlando to this end - about pluralistic genders and sexualities: Jessica Berman, Christy L. Burns, Jane de Gay, VL Smith...].

1.4.7 preserving the unintelligible

Although I aim to offer a model of gender in the novel, as Butler affirms, "radical and inclusive representability is not precisely the goal" (*Bodies* 25). Remaining *outside* what Butler calls the "logic of phallogocentrism" is necessary to prevent being coopted into that logic. The process of performative

citation is meant to preserve that which is excluded or unintelligible as a resource for continual resignification, as "the point of departure for a set of historical reflections and futural imaginings" (Butler *Bodies* 173). For, Butler explains that, "to bring in every marginal and excluded position within a given discourse is to claim that a singular discourse meets its limits nowhere, that it can and will domesticate all signs of difference" (25). Rather than aim for inclusion, one ought to position the "necessary outside" as a target that is beyond reach, as a fount for future subversions. This positioning allows individuals to harness opacity and unintelligibility as a resource for resisting the "violence of this exclusion," using unrepresentability as a tool for disruption.

1.4.8 Conclusion: performative citation queers distant reading:

Displacement through repetition; insubordination through subservience; deception through resemblance–these are the tools available to the subject that remains outside the logic of phallogocentrism. I began this analysis into *Orlando* by close reading sections of the text, to explore how gender functions as an enabling structure. This reading found that gender is closely coordinated with language, as Orlando and the biographer, across different narrative levels of the story, struggle with both simultaneously. I read for gender as an enabling structure, and then used text analysis to play with gender by repeating the same processes of computing "gendered" term similarities over and over again. I saw how gender in this novel resembles an expanding web of terms that multiply while remaining distinct, which complicates the notion of gender as a binary system even within that system. This method of iterating over text allowed me to illuminate the structure of the signifying power without giving that power the ability to counter that which is questioning its authority. Although one may attempt to formalize such a method, my goal is not to build reproducible schemas and models for analyzing gender in novels. Rather, I look to harness opacity and unintelligibility as resources for resisting inclusion. This method posits gender as a kind of technology of resistance, which the technology of digital tools can help to surface. I hope this work will encourage the further development of such approaches, which, as Butler nicely articulates, "begin, without ending, without mastering, to own – and yet never fully to own – the exclusions by which we proceed" (25).

1.5 etc:

1.5.1 Klein's Image of Absence, Caughie's Storm Cloud

1.5.2 gio on voyant / nltk

I'm playing around with voyant tools on Giovanni's Room, and realizing that my movements are carefully guided by this impression from textual scholarship of deformance. At every step I am deforming the text, creating a new text, with new potentials for reading.

This deformance is an iterative process.

There's a dip in the word "don't" toward the end of the novel, in section 9. But when we get get the contexts into its own text submission, there's a rise in this same sector. What's going on?

Turns out, there's a little spike in "don't"s in the middle of chapter five, a spike that is surrounded with a dearth of don'ts. This explains why there's a dip in the graph on the general text, and an uptick in the graph that isolates don'ts from the general text.

This activity calls for closer attention to the area of the spike, and its surroundings.

What if we read only the sentences with the word "don't" in them?

1.5.3 so this has been done before

`https://dhdebates.gc.cuny.edu/read/untitled-f2acf72c-a469-49d8-be35-67f9ac1e3a60/section/bd5a43c1-bbfe-4c5c-8c0d-c3db1776eb99`

1.5.4 Altschuler and Weimar on reproducibility

–> reproducing something perfectly overlooks the ways that all digital objects are unique, differentiated. Theory of textual criticism which shows how ther are more interesting things to do then create a digital "copy texte".

This notion extends to digital humanist practitioners.

they call to overturn the "unproblematic translatability of information between the senses" while maintaining that reproduction is the highest value. They argue to "texture the humanities", pointing out that much of DH prioritizes the visual over other senses – "privilege sight as the sense through which knowledge is accessible" (74). Rightly so, they argue, "The textured DH we call for here acknowledges that we cannot study knowledge only abstractly, apart from the senses, and that we cannot study literature, art, and history without including the history of embodied experiences" (74-75).

- “Touch This Page! uses 3-D printed facsimiles of raised-letter text to inspire reflection on the assumptions most people make about which senses are involved in reading” (82).

But they elide the one interesting trajectory when they place reproduction over remediation/deformance. They state their aims: “to expand the sensory accessibility of archives for all users and to do so through the digital reproduction—rather than the translation—of tactile knowledge” (76). Case example of the perfect reproduction:

- A scenario where “users... can download a visual copy with

descriptive data, engage with the text in virtual reality, and create their own textured facsimile. This technology once more makes possible the tactile reading experiences for which this volume was designed and promises library patrons a richer engagement with touch than most archives can currently provide—even in person (85-86).

The use case scenario makes the assumption that a reproduction is the ideal form of textuality, despite their asserted aims for "diversity of embodied experiences":

- “we must avoid tilting after the fiction of some ideal digital surrogate—like a virtual reality system that would flawlessly mimic original objects—lest we become digital Pierre Menards, expending extensive energy to improve our reproductions to discover, at last, that only the original perfects represents itself... Instead, we envision in our tactile futures multiple strategies that could not only open up access to varied experiences—past and present—but also diversity the ways embodied experiences structure our digital worlds” (86).

- in order to open up “multiple strategies” and diversity embodied experiences, we need a theory of text that is capacious enough to accept variation and transmediation.

- This argument overlooks deformance is a solution: the ways that creating new texts, paratexts, creates new objects of knowledge. It overlooks the performative, ala McGann, Clement.

In this view, digital becomes a means of optimization, efficiency, total knowledge and understanding.

1.5.5 The debates about TEI illustrates this tension between the

"conservative" and the "creative" impulses in textual editing, and shows how an encoding method that is highly structured can be used to mark or explore moments of textual instability or ambiguity.

1.5.6 felski on affects beside suspicion

Postcritical Reading... "in this sense, is not just a cognitive activity but an embodied mode of attentiveness that involves us in acts of sensing, perceiving, feeling, registering, and engaging" (Felski 176).

Felski: At stake is our receptivity: "to allow ourselves to be marked, struck, impressed by what we read" (Felski 12).

"the reader-text connection becomes part of a network rather than a self-enclosed dyad— yet a connection that remains vital to literary studies, especially in the classroom. Reading, in this light, is a matter of attaching, collating, negotiating, assembling—of forging links between things that were previously unconnected. It is not a question of plumbing depths or tracing surfaces... Interpretation becomes a coproduction between actors that brings new things to light rather than an endless rumination on a text's hidden meanings or representational failures" (Felski 174)

Surface reading challenges that search for absence by compelling a reader to stay with what the text says and how it says it rather than moving ahead to probe how it reflects and refracts larger cultural patterns. This critique reifies aesthetic objects and suggests that literary critics should embrace the literary.

1.5.7 mcpherson, benjamin on race and tech

Major developments in technology also perpetuate racial assumptions. Moving from networking technologies to software development, Tara McPherson explores the parallels between the Operating Systems and race relations, to show how the development of computer software betrays hegemonic assumptions about whiteness and elisions of difference.[16] She focuses on the key moment of 1960s United States, when Operating Systems, which is the foundational software that supports a computer's programs and basic functioning, developed alongside civil rights discourses. Her research focuses on how "the organization of information and capital" in OS development resonates in the struggles for

[16] Tara McPherson's "U.S. Operating Systems at Mid-Century: The Intertwining of Race and UNIX," Race After The Internet, ed. Lisa Nakamura and Peter A. Chow-White. Routledge, 2012.

racial justice: "Many of these shifts were enacted in the name of liberalism, aimed at distancing the overt racism of the past even as they contained and cordoned off progressive radicalism" (30). McPherson deconstructs the UNIX operating system which includes a hierarchical file system, a command line interpreter (the Terminal on Mac or Command Prompt on Windows), and a variety of software programs that are designed to work in tandem. McPherson points out that UNIX-based Operating Systems (like Mac and Linux) are distinguished by the ways that they partition and simplify complex processes into discrete components, similar to the ways that identity politics cordones off parts of the (social and technological) system into distinct units. While this cordoning was productive for the promotion of civil rights, it also, according to McPherson, "curtailed and short-circuited more radical forms of political praxis, reducing struggle to fairly discrete parameters" (30).

Crystallizing the intersection between Operating Systems and race relations, McPherson asserts that "Certain modes of racial visibility and knowing coincide or dovetail with specific ways of organizing data" (24). McPherson emphasizes the "rules" of UNIX philosophy, which lay out how UNIX's development prioritized the organization and simplification of data processing:

> Rule of Simplicity: Design for simplicity; add complexity only where you must. Rule of Parsimony: Write a big program only when it is clear by demonstration that nothing else will do. Rule of Transparency: Design for visibility to make inspection and debugging easier... Rule of Representation: Fold knowledge into data so program logic can be stupid and robust. 26

The rules of "Simplicity" and "Parsimony" ensure that programs will be composed of small, interlocking parts that can be easily updated and transported to newer versions. The rule of "Transparency" flattens nuance and ambiguity, making program components as legible as possible. The rule of "Representation," particularly the suggestion to "Fold knowledge into data" reduces the complexity of raw data, so that it can be easily input into multiple processes. According to McPherson, all of these rules work together to shore up the central design theory of "modularity,"[17] which stipulates that components are self-contained and interoperable, so they can be independently created, modified, and replaced without affecting the whole system.

[17] Potentially revise and deepen this section by linking to Barad & Haraway on situated knowledges and feminist science: Being modular in itself isn't bad, as long as you are aware of the ways that modularity creates limitations/reductions of data. Modularity needs a critical awareness of its own tools.

The role of control in creating the internet and the emphasis on data reduction in developing operating stystems leave their legacies on 21st century digital technology, where race becomes collapsed into data. Echoing McPherson, Ruha Benjamin asserts that technology reproduces social inequities under the guise of objectivity and progressivism.[18] Turning to technology, Benjamin explores how innovations in Artificial Intelligence and algorithmic computing extend racist paradigms into ever new tools, particularly in data gathering and surveillance. The creators of these new technologies mark, track, and quantify blackness, for example, in databases for healthcare or financial services that associate "black names" with criminality (Benjamin 5). With each update, technology is continually promoted as efficient and progressive in a way that masks how it exploits data about its subjects. Benjamin explains, "we are told that how tech sees “difference” is a more objective reflection of reality than if a mere human produced the same results... bias enters through the backdoor of design optimization in which the humans who create the algorithms are hidden from view" (5-6). As she points out, "the road to inequity is paved with technical fixes” (7). Like the creators of UNIX, the creators of such tools and algorithms operate under assumptions of white universality that inevitably marks blackness as "other."

1.5.8 sedgwick on liberatory vs prohibition

Sedgwick searches for "some ways of understanding human desire that might be quite to the side of prohibition and repression, that might hence be structured quite differently from the heroic, 'liberatory,' inescapably dualistic righteousness of hunting down and attacking prohibition/repression in all its chameleonic guises" (10).

2 more sources

https://jitp.commons.gc.cuny.edu/numbering-ulysses-digital-humanities-reductivism-and-
#ftn1 https://jitp.commons.gc.cuny.edu/data-fail-teaching-data-literacy-with-african-d

[18] Her work also extends Michelle Alexander's ideas from *The New Jim Crow* (2010), which argues that modern society perpetuates racist violence and segregation by criminalizing race through the war on drugs and mass incarceration.

3 commands

c-c c-x f => create a new footnote c-u c-c c-x f then select sort then renumber footnotes

block quotes: #+BEGIN$_{\text{QUOTE}}$ & #+END$_{\text{QUOTE}}$

4 annotated bib

4.0.1 Moretti, Franco. Graphs, Maps, Trees: Abstract Models for Literary

History. 2007.

This monograph defines and demonstrates "distant reading", a deliberate abstraction and visualization of textual, bibliographic, and historical data about literature in order to answer questions about form and history of literature as a whole.

4.0.2 Drucker, Johanna. "Introduction," SpecLab: Digital Aesthetics and

Projects in Speculative Computing. 2009.

From a series of literary experiments at SpecLab at UVA, Drucker posits a method of speculative computing that pushes against ideology of mathesis—the idea that formal logic can represent or unlock human thought and experience, that knowledge is information—by using computational methods to provoke and push against what we think we know.

4.0.3 Ramsay, Stephen. Reading Machines: Toward an Algorithmic

Criticism. 2011.

Ramsay proposes a method of Algorithmic Criticism, which approaches the constraints of computation as a liberating force that allows the critic to reflect on her own phenomenal experience of texts rather than seek definitive answers.

4.0.4 Drucker, Johanna. "Humanities Approaches to Graphical Display." DHQ:

Digital Humanities Quarterly. 2011.

Digital Humanities needs graphical expressions that question, resist, and reveal the assumptions of graphical display—that it is observer-independent,

objective, universal representations of knowledge, that data is "raw" rather than captured.

4.0.5 Felski, Rita. The Limits of Critique. 2015.

Examines the role of affect in literary criticism, showing how the hermeneutics of suspicion, as a militant mode of reading, forecloses the possibilities of connection between reader and text.

4.0.6 Piper, Andrew. Enumerations: Data and Literary Study. 2018.

Mixes distant and close reading in order to interrogate how the study of literary quantity can lead to insights about literature.

4.0.7 Landow, George. Hypertext 3.0: Critical Theory and New Media in an Era

of Globalization, 2006. Print.

The hypertext format engages the postmodern (structuralist/post-structuralist and deconstructive) theories about the multiplicity and instability of meaning in texts, as well as new radical conceptions of authorship

4.0.8 Fisher, Caitlin. These Waves of Girls, 2001. Web.

The profusion of hyperlinks frustrates the reader by offering too many narrative paths. The reader's frustration in navigating through the hypertext relates to the work's theme of sexual discovery. In following the narrator as she develops her sexuality, the reader experiences her own cycles of desire and frustration.

4.0.9 Tenen, Dennis. Plain Text: the Poetics of Computation, 2017. Epub.

Tenen proposes a microanalysis, computational poetics, or an archaeology of platforms and infrastructures (behind surface content). We don't engage directly with the textual conduit, so we need to perform a media archaeology in order to have access to these processes and be in charge of them.

4.0.10 Rockwell, Geoffrey and Stefan Sinclair. Voyant-Tools. 2018.

The par excellence example of literary criticism, which encourages discovery.

4.0.11 Galloway, Alexander. Protocol: How Control Exists after

Decentralization. 2004.

Horizontal freedom requires universalization, standardization. Resistance comes from within the system, using exploits.

4.0.12 Chun, Wendy. Control and Freedom: Power and Paranoia in the Age of

Fiber Optics. 2006.

The potential for individual empowerment comes from harnessing our own vulnerabilities and exposure. Without exposure, give and take, there is no network.

4.0.13 Bennett, Jane. Vibrant Matter: A Political Ecology of Things. 2010.

Approaches the network as a vital non-anthropocentric ecology, connecting humans to inert matter, endowing them with agency.

4.0.14 Moten, Fred and Stefano Harney. The Undercommons: Fugitive Planning &

Black Study. 2013.

A way of being in but not of the university, system, network. Studying, collecting debt, being shipped are ways of relating to one another that resists the system.

4.0.15 Tufekci, Zeynep. Twitter and Tear Gas: the Power and Fragility of

Networked Protest. 2017.

How humans aided with technology create networks, and how these operate on the ground. What capacities do they have, how does their horizontalism both help and hurt?

4.0.16 Gaboury, Jacob. "Becoming NULL: Queer Relations in the Excluded

Middle." Women & Performance: a Journal of Feminist Theory. 28:2, 2018. pp. 143-158. Web.

What are queer modes of being within technological systems, modes that refuse the gesture of capture and extraction? The NULL marker in SQL offers a way of becoming that enacts a queer logic that is explicitly situated within the logic of information systems but refuses this gesture of capture and extraction.

4.0.17 Kittler, Friedrich. Gramophone, Film, Typewriter. 1999.

At first, media passes through symbols (written signifier), then analog media is stored as physical traces, and now, new media loses its specificity as a stream of numbers ("eyewash"), surface effects which are then reassembled in the human. The human perceptual system disperses into the apparatus.

What sense perceptions are we not aware of or not tapping? This opens up the potentials of bits and fiber.

4.0.18 Hayles, N. Katherine. Writing Machines. 2002.

Media is re-conceived, written, mediated for different formats—the concept of remediation.

Reading technotexts takes place within a distributed cognitive environment. We are part of a larger cybernetic circuit.

4.0.19 Kirschenbaum, Matthew. Mechanisms: New Media and the Forensic

Imagination. 2008.

Digital media create an illusion of immateriality—screen essentialism. We should approach materiality on two levels, the formal and forensic, to counter misunderstandings and occlusions of new media. Electronic texts are not ephemeral or homogenous, they are inscribed and made of unique traces.

4.0.20 Blanchette, Jean-François, "A Material History of Bits." Journal of

the American Society for Information Science and Technology. No. 62: pp. 1042-1057, 2011.

4.0.21 Hansen, Mark. Feed-Forward: On The Future of 21st Century Media. 2014.

The way that media works in the 21st century both marginalizes and expands human perception. Things we have no awareness of are out there feeling for us. We have an expanded perceptual reach, but our sensations are indirect. This puts consciousness in an anticipatory mode, always future oriented, focusing on what is nearly emergent— "feed forward".

4.0.22 Woolf, Virginia, Emily McGinn, Amy Leggette, Matthew Hannah, and Paul

Bellew. "Comparing Marks: A Versioning Edition of Virginia Woolf's 'The Mark on the Wall.'" Scholarly Editing: The Annual of the Association for Documentary Editing. Vol. 35, 2014.

Presents a "versioning edition" of the various print witnesses of Woolf's short story, the Mark on the Wall, from 1917-1944. The versioning edition's attention to the story over time also implicitly draws attention to the way that time functions on the level of narrative.

4.0.23 Peters, John Durham. The Marvelous Clouds: Toward a Philosophy of

Elemental Media. 2016.

4.0.24 McKenzie, D.F. Bibliography and the Sociology of Texts. 1986.

Individual texts are witnesses of an ideal text that is never to be fully realized—the florid branches of an invisible trunk. Bibliography is about tracking the book's history as a social document, the social relations involved in its transmission, and about recognizing different critic's "misreadings". Book history is a history of misreadings.

4.0.25 Tanselle, Thomas. "A Rationale of Textual Criticism." 1992.

Texts are corrupted in physical form and require assistance of an editor to present in an authentic state. The imperative of textual criticism is to restore and correct.

4.0.26 Derrida, Jacques. "Archive Fever: A Freudian Impression."

Diacritics. Vol. 25, no. 2. 1995.

The archive works against itself: creating an archive also creates the potential to forget and destroy. Externalization. The instant of archivization involves technology: 'the prosthetic experience of the technical substrate' (22).

4.0.27 McGann, Jerome. Radiant Textuality: Literature after the World Wide

Web. 2001.

Electronic editing ought to capture what is inherently n-dimensional about literary texts—to engage in the quantum poetics of each textual detail.

4.0.28 Singer, Kate. "Digital Close Reading: TEI for Teaching Poetic

Vocabularies." The Journal of Interactive Technology and Pedagogy. 3, May 15, 2013.

Using TEI to teach close reading finds that one can approach it to engage individualized readings—marking moments of textual instability rather than formal aspects. Given that the tool is flexible enough, we do not have to agree on a schema, standardize a schema, in order to use the tool to engage the incommensurable.

4.0.29 Caughie, Emily Datskou and Rebecca Parker. "Storm Clouds on the

Horizon: Feminist Ontologies and the Problem of Gender." Feminist Modernist Studies. 1:3, 230-242. 2018.

What do we do when our tools won't allow us to capture or convey certain elements of the text? It turns out that the limitations of the computer are actually a good indicator of things that maybe should be left unresolved or unfixed—like gender ontology.