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Special Issue

Digital Humanities in American Studies

Edited by Michał Choiński

INSTITUTE OF ENGLISH STUDIES
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Warsaw 2020

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Michał Choiński

Opportunities and Challenges of DH in American Studies

> As a profession, we are just learning how to live with computers, just beginning to integrate these machines effectively into writing- and reading-intensive courses, just starting to consider the implications of the multilayered literacy associated with computers.
>
> Cynthia Selfe,
> "Computers in English Departments:
> The Rhetoric of Technopower"

This special issue of *Polish Journal of American Studies* follows in the footsteps of recent special issues of *American Quarterly* (2018) and *Amerikastudien* (2019), both of which were dedicated exclusively to the exploration of the crossroads between American Studies and Digital Humanities (DH). In particular, the voluminous size of *American Quarterly,* which includes as many as thirty four articles, testifies to the need to provide publication platforms for essays reporting on various DH projects carried out on both sides of the Atlantic and beyond. The decisions of editorial boards to feature collections of essays on American Studies and DH is symbolic of the growing relevance of this area of study. This relevance is likewise reflected in the programs of academic conferences. Multiple computational panels have become the staple of the annual MLA convention since the 1990s, and a steady run of European conferences on American Studies clearly follows this path. The conferences of European Association of American Studies in Belfast (2016) and in London (2018), as well as the conferences of German Association of American Studies in Berlin (2018) and of Polish Association of American Studies in Łódź (2018), all featured DH-oriented panels. The annual Digital Humanities conference organized in 2016 by the Philological Faculty at the Jagiellonian University in Kraków played host to 900 participants, of whom two hundred were from the US. DH has become a permanent, inalienable element of American Studies.

All of the essays featured in these journals, as well as the papers delivered at these conferences professed themselves to be DH-oriented. The term "Digital Humanities" in itself is nebulous. It emerged in the early 2000s as an umbrella concept encompassing a wide array of initiatives employing the computing potential of various technologies, and their use in a wide spectrum of research fields not associated with sciences, but with arts and humanities. Yet, whoever poses the question about the definition of the term steps onto a slippery slope. The editors of the second volume of *Debates in the Digital Humanities* (2016), Lauren F. Klein and Matthew K. Gold, acknowledge the evasive character of the term used to define the field, because of overwhelmingly wide array of its applications: [along] "with the digital archives, quantitative analyses, and tool-building projects that once characterized the field, DH now encompasses a wide range of methods and practices: visualizations of large image

sets, 3D modelling of historical artefacts, 'born digital' dissertations, hashtag activism and the analysis thereof, alternate reality games, mobile makerspaces, and more. In what has been called 'big tent' DH, it can at times be difficult to determine with any specificity what, precisely, digital humanities work entails."

Understandably, nowadays, all academics in humanities rely on digital technologies, whether in the form of open access journals, online image databases or linguistic corpora – or simply, they remain responsive to emails and share content through social media, be it *Facebook* or *Twitter*. Yet, DH goes beyond mere scouting for data, and the practice of social connectivity and activism. As a network of diverse research methods, DH offers computing resources that allow us to undertake academic projects whose completion would hardly be feasible without the aid of technology. The last five decades have been marked by a tremendous technological leap in terms of the potential offered by the hardware, and this exponential growth has been accompanied by the development of networks and infrastructure which have enabled a series of projects whose completion would take decades without computers. Text processing is an excellent example of this matter. In our life, we are able to read ca. 13,000 books – the number of books literary historians can effectively study in their lifetime to discuss the evolution of literary processes is disappointingly small compared to the plethora of texts that are available for analysis. DH methods of inquiry may help to overcome these limitations, not by conducting the reading for the researcher, but by suggesting directions of research and by establishing connections between groups of texts one did not think about due to the sheer, overwhelming size of the corpus. In this sense, DH can open up new horizons of research and contribute to the emergence of fresh perspectives, one would not be able to pursue, let alone come up with, if it were not for the aid of technologies. Students and researchers alike rely on this novel infrastructure and experience the impact of the digital transformation of the quotidian world of academia.

The Proliferation of Projects

From the outset, American studies departments have been particularly welcoming to DH-based research initiatives. In particular, text-based data processing has a relatively long tradition whose foundations were laid by early-generation hardware from the 1970s – in this sense, analytical results of DH-based research have been palpable in stylistics, linguistics and history studies for a long time. Since Frederick Mosteller and David Wallace released their breakthrough study of the authorship of the *Federalist Papers* (1964), the contribution of Digital Humanities into various branches of American studies has been increasingly visible. The expansion of infrastructure at various academic centers determines how DH researchers conduct their research – namely, the prevalent role of grant-based projects in the field. As a discipline of study, DH seems to advance through projects which on the one had make use of the state-of-the-art computational tools, and, on the other hand, stimulate the development of novel versions of these tools. In DH, theory informs practice and practice informs theory. The 1990s saw the advent of projects like *Women Writers Project*, which sought to render pre-Victorian female authors more accessible by amassing a large collection of rare texts, the *Walt Whitman Archive*, which endowed hypertext editions of Whitman's texts

with collections of photos and audio recordings, *The Rossetti Archive* focused on the poetry, illustrations, letters, and manuscripts of English Pre-Raphaelite poet, painter, designer, and translator, Dante Gabriel Rossetti or – more recently – *Photogrammar,* an extensive web-based platform for organizing, searching, and visualizing a large corpus of 170,000 photographs from 1935 to 1945.

In Poland there have been a number of DH-oriented projects connected with American Studies, most of which have been financed by the Polish National Science Center. In the Institute of English Studies at the Jagiellonian Unievrsity "The Language of Eighteenth-Century American Colonial Sermons. A Rhetorical and Stylometric Analysis" (2015-2018) OPUS project was realized in cooperation with the Jonathan Edwards Center at Yale University to study large corpora of texts from colonial period with the help of stylometry. At the American Studies Center at the University of Warszawa another OPUS project is being carried out, "Digital Weather: Speculative Video Games and Climate" (2020-2022) to determine the representation of climate change in video games. Also, members of the Computational Stylistic Group at the Institute of Polish Studies at the Polish Academy of Sciences contribute to the "Network-Analysis and Spatial Stylometry in American Studies (NASSA)" project (2019-2021), set up by the DH lab at the Universität Potsdam, Hasso Plattner Institute and SUB-Göttingen. In that project, a corpus of almost two thousand dramatic texts from the US is being investigated to extract a wide array of social and geo-political historical data.

The extensive development of digital infrastructure encouraged by research grants is also reflected in the fact that DH, more than any other field in the humanities, emboldens cooperative and collaborative efforts in the academia. The focus on research projects, framed in a more general, umbrella infrastructure, fosters the creation of research teams and hubs, which, by their very nature, invite scholars from different disciplines to contribute in the production of outcomes. In this sense, DH stimulates a paradigm shift, and a drift towards interdisciplinary research carried out under the auspices of a network of academic institutions. In non-DH research, rarely does one come across articles written by multiple authors – at the crossroads of digital field and traditional humanistic approaches, it is not uncommon for essays submitted to journals to have between three and seven authors. So, as such, DH offers a different approach to the scholarly endeavour in so far as it harbours networks of researchers who by the very nature of the method engage in exchange of ideas and collaboration. As one can read at the ThatCamp ("The Humanities and Technology Camp") website, "DH values collaboration, plurality, investigation of human culture, and the disruption of and reflection on traditional practices and is concerned with not just the use of digital technology for humanities projects but how the use of digital technology for humanities projects changes the user's experience."

False Promises and Challenges

The exploration of all the opportunities offered by DH ought to be accompanied by a reflection on its limitations. In his essay from *The New Republic,* Adam Kirsch warns about the "false promise" of DH and the hyperbolic "spirit of salesmanship" used to promote both digital methods of enquiry and the findings they yield. The rhetoric

employed by some advocates of DH foretells an immediate revolution in thinking and a fundamental change of paradigm, something which Kirsch finds dubious, to say the least. As he explains, "[it] makes no sense to accelerate the work of thinking by delegating it to a computer when it is precisely the experience of thought that constitutes the substance of a humanistic education. The humanities cannot take place in seconds." In consequence, in dealing with DH, healthy scepticism is mandatory: "[the] best thing that the humanities could do at this moment, then, is not to embrace the momentum of the digital, the tech tsunami, but to resist it and to critique it. This is not Luddism; it is intellectual responsibility."

The first challenge of DH is connected with the paradigm shift, and the unrelenting drive towards research that is so strongly data-based. In his influential study *Macroanalysis. Digital Methods and Literary History* (2013), Matthew L. Jockers asserts that the modern literary scholars can no longer be content with "anecdotal" evidence to support their theories, and that they need to extend the scope of their search, including a plethora of texts not included in the canon. Jockers encourages academics use DH to break away from the habit of subjectivity. Accompanying this assertion is the claim that this scaling up and resulting investigation of thousands of texts may give unforeseen insights into how literary trends change over time, across periods, and within demographic groups. This drive to move from the microscale to the macroscale has encountered resistance. In *Digital Humanities: Knowledge and Critique in a Digital Age*, David M. Berry and Anders Fagerjord argue that DH-based research instead of following the drive to amass larger and larger corpora should "focus on the need to think critically about the implications of computational imaginaries, and raise some questions in this regard. This is also to foreground the importance of the politics and norms that are embedded in digital technology, algorithms and software. We need to explore how to negotiate between close and distant readings of texts and how micro-analysis and macro-analysis can be usefully reconciled in humanist work" (2017: 135).

Likewise, as with many other fields in the humanities, DH is encouraged to put more emphasis on diversity, inclusiveness as well as accessibility of infrastructure. In particular, in the academic reality so preoccupied with the expansion of infrastructure, this last element is of relevance. The dissimilarities in terms of technological potential of various academic centers engaged in DH-related research and differing access to databases and networks of corpora may considerably hinder the development of project at universities which are not endowed with competitive funding and lack access to the state-of-the-art hardware. This may create considerable disproportions between various research hubs, and, in consequence, run the risk of thwarting the attempts of less privileged institutions and groups of researchers to contribute to the field. More than ever, international and inter-institutional bridge building ought to remain a vital element accompanying DH-oriented undertaking.

Seven Takes on DH & American Studies

The essays collected in this special issue of PJAS testify to the methodological diversity of Digital Humanities, incorporating approaches like the authorship attribution, geomapping, DH-aided archeology and digital hermeneutics. The opening

article takes on the strongest theoretical perspective. A group of authors, Lauren Tilton, Emeline Blevins, Luke Malcynsky, and Hanglin Zhou, examines the role of metadata in DH. Their study demonstrates how the "data about data" may be applied in the wide spectrum of current directions and methods present in various research DH projects in American studies, also in the context of political changes and transformations.

The second article is also collaborative. Eight authors, Colin Wilder, Sam T. McDorman, Jun Zhou, Adam King, Yuhang Lu, Karen Y. Smith, Song Wang, and W. Matthew J. Simmons demonstrate how DH-based technologies may be used for archaeological research. The authors represent various academic centers, but research team from the University of South Carolina, presents the preliminary findings of Snowvision, a digital archaeology project in which computer vision is applied to reconstruct southeastern Native American paddle designs from the Swift Creek period, ca. 100-850 CE.

Robert Boss's essay takes the readers to the colonial period, reporting on his project *Visual Edwards*. Boss seeks to augment the existing interpretations of the works of Jonathan Edwards, an eighteenth-century colonial religious thinker and influential preacher. Edwards's corpus is a particularly opulent one, encompassing twenty six volumes of treatises, sermons and letters, and, as such, it poses a hermeneutic challenge for anyone with the ambition of reading and studying it in detail. In *Visual Edwards*, Boss seeks to address this dilemma, supplementing traditional readings of Edwards's texts with a method based on Processing and Python programming languages producing a network of intertextual markers, which are then presented in the form of three-dimensional visualizations.

In the next article, Steffen Wöll uses various parts of Richard Henry Dana's eighteenth-century travelogue *Two Years Before the Mast*. Dana, an American lawyer from Massachusetts, described the hardships of a strenuous life at sea in the memoir, unaware of the fact that his book would become an unofficial guide for emigrants traversing the unmapped far western territories during the Mexican-American War. Wöll studies the representations of these journeys and uses DH methods to provide visualizations of how spatial imagination is represented in *Two Years Before the Mast*.

The fifth essay, Dennis Mischke uses a combination of text analysis tools and geographic information systems (GIS) to study the a 17th century captive narrative by Mary Rowlandson. The text reports on Rowlandson's confinement and travels through colonial New England. Mischke's study allows to better understand how the historical space is created through the narrative, and how the movement through that space becomes emblematic of the conflicts of King Philip's War.

Whit Frazier Peterson seeks to use computational methods of authorship attribution to determine who wrote *Men, Marriage and Me*, a 1930 memoir ostensibly the work of Peggy Hopkins Joyce, an American actress and celebrity. Peterson employs stylometry, a method which juxtaposes various "authorial fingerprints" by calculating the frequencies of the most common words, to determine if *Men, Marriage and Me* might have been ghost-written by Wallace Thurman, an African American author of the Harlem Renaissance.

Finally, in her article, Anna Bendrat aims to draws on the theories of cognitive processing to discuss the narration of Hanya Yanagihara's recent novel *A Little Life*

(2015). Bendrat uses R-environment software and computational analysis to explore the differences between various narrative voices of the book on the level of *texture*, and to discuss the reader's intermental relationship with the various impersonalizations of the main character.

DH in the Times of COVID

There is yet another context that ought to be taken into account for this issue of the *Polish Journal of American Studies*. I am writing this Introduction in the midst of the global COVID-19 pandemic, when the methods, aims and functioning of academia are being put to the test. All over the world, conferences are being cancelled and moved to online platforms, regular class teaching is suspended and substituted with online sessions, and the academic database infrastructure that was often viewed as secondary backup turns out to be a critical asset for the continuation of global research projects. The COVID-19 pandemic is forcing us to rethink both the safety and the logistics of research. Despite the limitations of online sessions, particularly the lack of in-person contact and potential for serendipitous encounters between panels, online academic conferences will be the norm for the foreseeable future. During this period, the use of new technologies offered by DH may play a key role in a wide array of ways. The existing infrastructure may help in bringing together teachers and students and allowing them to share ideas, overcoming the limitations imposed by social distancing. The visualizations generated in a number of research projects may serve as excellent teaching tools at a time when face to face contact with students has to be replaced by remote education and when teachers are struggling to enhance their online lessons with engaging teaching materials. Finally, the general level of digital literacy stimulated by the growth of DH is helpful for the continuation of academic activities all over the world, particularly at universities which are struggling with the limitations of lockdowns.

Works Cited

Berry, David M., and Anders Fagerjord. *Digital Humanities: Knowledge and Critique in a Digital Age*. Wiley, 2017.

Kirsch, Adam. "Technology Is Taking Over English Departments." *The New Republic*. 2 May 2014. https://newrepublic.com/article/117428/limits-digital-humanities-adam-kirsch. Accessed 10th August 2020.

Klein, Lauren F., and Matthew K. Gold. "Digital Humanities: The Expanded Field." *Debates in Digital Humanities*. U of Minnesota P, 2016. https://dhdebates.gc.cuny.edu/. Accessed 10th August 2020.

Mosteller, Frederick, and David L. Wallace. *Inference and Disputed Authorship: The Federalist*. Addison-Wesley, 1964.

The Humanities and Technology Camp. https://thatcamp.org/. Accessed 10th August 2020.

Lauren Tilton, Emeline Alexander, Luke Malcynsky and Hanglin Zhou

The Role of Metadata in American Studies

Abstract: This article argues that metadata can animate rather than stall American Studies inquiry. Data about data can enable and expand the kinds of context, evidence, and interdisciplinary methodological approaches that American Studies can engage with while taking back data from the very power structures that the field aims to reveal, critique, and abolish. As a result, metadata can be a site where the field realizes its intellectual and political commitments. The article draws on a range of digital humanities projects, with a focus on projects created by the authors, that demonstrate the possibilities (and challenges) of metadata for American Studies.

Keywords: digital humanities, data, metadata, method

Rather than defined by a particular subject or set of methods, American Studies continues to be formulated around a set of commitments.[1] They include investigating cultural and social formations, interrogating power, and subscribing to an expansive and critical formulation of “America” (Gruez). Among them is engagement with evidence and methods that are as varied as the inter, multi, and transdisciplinary scholarly inquiry that animates the field. Upholding these commitments may seem difficult when drawing on methods from the digital humanities.

Concerns about digital humanities abound that should give American Studies scholars pause.[2] One is the kind of data necessitated by digital methods. Sources must be converted into a form that can be read by a computer for digital humanities methods and their related tools. Discomfort comes when transforming sources such as films, oral histories, and paintings into data formats such as MP4, JPEG, and TXT files as well as data types such as strings, numbers, and boolean.

1 For examples, see Deloria, Philip J., and Alexander I. Olson. *American Studies: A User’s Guide*. University of California Press, 2017; Maddox, Lucy, ed. *Locating American Studies: The Evolution of a Discipline*. JHU Press, 1999; Pease, Donald et al. *The Futures of American Studies*. Duke University Press, 2002; Rowe, John Carlos. *The New American Studies*. University of Minnesota Press, 2002. Another site to see the transformation of the field is through the Presidential Address to the American Studies Association published annually in American Quarterly.

2 For examples of more nuanced debates in American Studies, see Cordell, Ryan. “A Larger View of Digital American Studies”, *Amerikastudien/American Studies*, vol 61 no. 3, 2016; Dunst, Alexander and Dennis Mischke. “Introduction: The Challenge and Promise of Digital American Studies”, *Amerikastudien/American Studies* vol 63 no, 2, 2018, https://amst.winter-verlag.de/article/AMST/2018/2/4; Tilton, Lauren, Amy E. Earhart, Matthew Delmont, Susan Garfinkel, Jesse P. Karlsberg, and Angel David Nieves. “Introduction: American Quarterly in the Digital Sphere.” *American Quarterly*, vol.70, no.3, 2018, pp. 361-370. For examples of more polemic concerns, see Allington, Daniel, Sarah Brouillette, and David Golumbia. “Neoliberal Tools (and Archives): A Political History of Digital Humanities.” *LA Review of Books* (2016). Marche, Stephen. “Literature Is Not Data: Against Digital Humanities.” *LA Review of Books* (2012); Syme, Holger and Scott Selisker. “In Defense of Data: Responses to Stephen Marche’s Literature Is not Data.” *LA Review of Books* (2012).

A common argument is that this kind of data reduces the source's complexity, and therefore, important information and context are lost (Nowviskie). The Text Encoding Initiative (TEI), for example, is partially a response to this concern; scholars across fields collaborate to create structured data that captures the nuances of a text that has been converted to a digital form.[3] The concern extends to each part of the process of creating, collecting, analyzing, and communicating data.[4]

Yet, as scholars like Bethany Noveskie argue, digital humanities is positioned to amplify not reduce the careful attention to nuance and context that animates interdisciplinary humanistic inquiry (Nowviskie). While she focuses on the possibilities of "small data" in relation to "big data", we want to focus on the possibilities of metadata for American Studies. As the data that describes and provides information about data, metadata can animate rather than stall American Studies inquiry. Along with serving as a strategy to add context to the sources, the process of creating metadata brings attention to which sources are being included and put into conversation and therefore puts a spotlight on what counts as evidence in the field. Specifically, creating and using metadata makes available methods from the digital humanities that allow for the kinds of interdisciplinary inquiry that the field values. Finally, creating American Studies-inflected metadata is one way in which the field can take back the power over datafication from multinational corporations and proactively break down the power structures that the field exposes and challenges. Metadata, therefore, can enable and expand the kinds of context, evidence, and interdisciplinary methodological approaches that American Studies can engage with while taking back data from the very power structures that the field aims to reveal, critique, and disassemble. In other words, metadata can become a site where the field enacts its intellectual and political commitments.

The essay is organized into four sections. The first three discuss metadata as context, evidence, and method. The final section will address why American Studies needs to intervene in the creation of metadata. We will draw on case studies from our experiences on digital humanities projects engaged in American Studies inquiry to demonstrate the possibilities and challenges of metadata for the field. The sections in aggregate reveal the critical role that metadata can play in American Studies.

Metadata as Context

Since its origins in the mid 20th century, a feature of American Studies has been the importance of context. One of the initial calls of the field was to bring literary criticism and historical research in conversation (Deloria and Olson; Gordon 141-159; Marx).[5] A rebuke of New Criticism, these scholars argued that understanding the meaning of forms such as a novel required attention to historical context. To fully understand the social and cultural impact of these forms required more than a self-contained close analysis. The field has continued to add other ways to take into account other kinds

3 For more on TEI, see https://tei-c.org.

4 For more about these debates, see the Debate in the Digital Humanities Series at https://dhdebates.gc.cuny.edu.

5 For a chronological bibliography, see Moses, Christopher. "American Studies: An Annotated Bibliography", https://www.reed.edu/am_studies/resources/AmStudBibF00.pdf.

of context by adding different ways of knowing to the analytical repertoire. Attention to circumstances such as affect, embodiment, and mediation from fields such as affect studies, performance studies, and media studies, for example, are now ways in which scholars add context and nuance to their analysis. How to incorporate this context with certain methods is well-established, adding context when drawing on methods from the digital humanities is a more recent challenge.

When discussing digital humanities, it is common to hear someone talk about collecting and analyzing data. The distinction between which information was conceptualized and organized as data and metadata as well as which kinds of data were used for which DH methods is often effaced. Yet, it is challenging to answer humanities questions through digital humanities methods without both parts. For example, one can use text analysis methods such as word frequencies to analyze a set of documents such as diaries, meeting notes, and newspapers.[6] However, without knowing information such as date, creator, and author, the analysis will be limited. As a result, metadata provides the context for a more nuanced interpretaiotn of the data. While often hidden, metadata as a digital form for adding context is critical.

interview_title	interviewer	location	date
The Hines	Annie L. Bowman	Alabama, Escambia, Atmore	
Another version of the above interview	Annie L. Bowman	Alabama, Escambia, Atmore	1939-2-3
Julia Rhodes	Maude Cain	Alabama, Tallapposa, Alexander City	1938-10-11
Bertie Turner	Maude Cain	Alabama, Tallapposa, Alexander City	1939-1-17
Looking Around with a Hay Farmer	Luther Clark	Alabama, Sumter, McCainville	1938-9-14
Soil Pipe Worker	Victoria Coleman	Alabama, Calhoun, Anniston	1939-1-31
Sam Lynn, Fisherman and River Rat [Famous for Fish]	Gertha Couric	Alabama, Barbour, Eufaula	
Mid-Wives are Called Grannies	Gertha Couric	Alabama, Barbour, Eufaula	
Three Workers of Cowikee Cotton Mill	Gertha Couric	Alabama, Barbour, Eufaula	1938-10-13
The Hughes Family	Gertha Couric	Alabama, Barbour, Eufaula	1938-10-20
The Sam Andersons-Cotton Mill Workers	Gertha Couric	Alabama, Barbour, Eufaula	1938-10-21
Mill Workers	Gertha Couric	Alabama, Barbour, Eufaula	1938-10-20
Ed West-Installment Collector	Gertha Couric	Alabama, Barbour, Eufaula	1939-2-14
My Time is Mighty Nigh Out	Gertha Couric	Alabama, Barbour, Eufaula	1939-2-14
A Day on the Farm	Gertha Couric	Alabama, Catalan, Richlands	
Another version of the above interview	Gertha Couric	Alabama, Barbour, Comer	1939-1-20
Fifty-Two Years in the Cotton Mill	Gertha Couric	Alabama, Barbour, Eufaula	1938-10-13
Sharon Cousins, Knight of the Road	Francois L. Diard	Alabama, Mobile, Mobile	
Veteran Newspaper Man	Noma Dobson	Alabama, Talladega, Sylacauga	1939-1-23
C. F. Gerber, Farmer	Charles M. Donigan	Alabama, Colbert, Sheffield	1939-1-16
Story of a Minister's Family and Life	Lawrence F. Evans	Alabama, Baldwin, Fairhope	1939-1-18
Master Cain, of the Grover Cleveland, of Bayou la Batre	Lawrence F. Evans	Alabama, Mobile, Bayou la Batre	1938-11-1

Figure 1: Example of a database using life histories from the Federal Writers Project. The observation is the interview and the first entry for each row. The other columns are the variables. They describe a characteristic about the life history such as an interviewer.

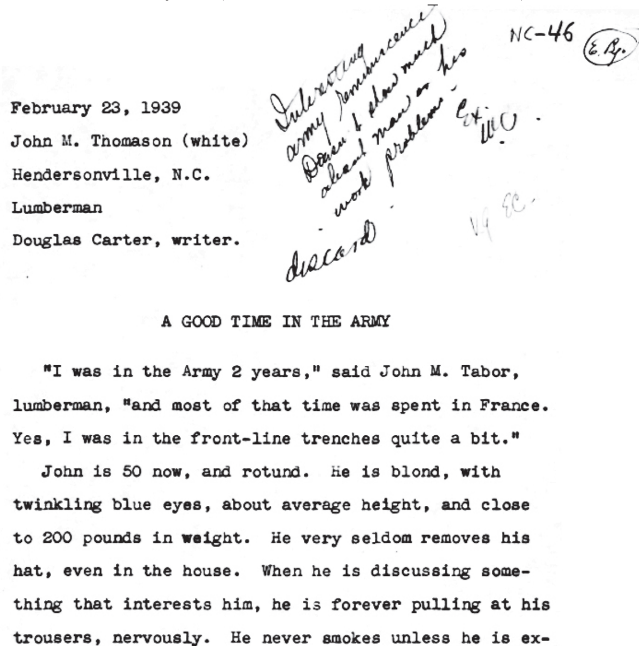
Metadata is often added in the form of a relational database, often subscribing to the principles of database normalization.[7] In these cases, each observation is a row and

6 For an example of a diary, see Cameron Blevin's work on Martha Ballard's Diary (http://historying.org/martha-ballards-diary/). For an example of meeting notes, see Colored Conventions Project (https://coloredconventions.org). For an example of newspapers, see the Viral Texts Project (https://viraltexts.org).

7 For an example of how to set-up a normalized database and how it then enables data analysis, see:

each variable is a column. For example, let's say that we are working with a set of oral histories from the 1930s. Each interview would be row and each characteristic about the interview such as interviewee name, date of interview, and location conducted would be a column. The variables become a strategy for adding context. In other words, they are data (i.e. interviewer name) about the data (i.e. an oral history transcript). A project on oral history in the 1930s demonstrates how the context that can be added through metadata becomes a powerful strategy for American Studies inquiry.

As an extension to *Photogrammar*, a team including Emeline Alexander is using digital humanities methods to create interactive interfaces for users to explore questions about how, why, and for whom the U.S. federal government funded forms of documentary expression during the Great Depression. One form is the "life histories" conducted by the Federal Writers Project (FWP) in the American South. An antecedent to oral histories, they provide primary source material on how people lived during this period. While the narratives themselves are significant for the information they hold, they also offer a lens with which to view the FWP. Who was allowed to interview, which stories were recorded, and how the subjectivities of the interviewer and interviewee shaped the life histories become essential questions for interrogating the role of the federal government in defining whose voices counted and would shape the historical record. As an American Studies project, the areas of inquiry bring together methodologies and questions from the digital humanities, documentary studies, history, and rhetorical studies. To pursue these areas of inquiry, the team created metadata to enable multiple kinds of analysis (Rivard, Arnold, and Tilton).


NC-46

February 23, 1939
John M. Thomason (white)
Hendersonville, N.C.
Lumberman
Douglas Carter, writer.

discard

A GOOD TIME IN THE ARMY

"I was in the Army 2 years," said John M. Tabor, lumberman, "and most of that time was spent in France. Yes, I was in the front-line trenches quite a bit."

John is 50 now, and rotund. He is blond, with twinkling blue eyes, about average height, and close to 200 pounds in weight. He very seldom removes his hat, even in the house. When he is discussing something that interests him, he is forever pulling at his trousers, nervously. He never smokes unless he is ex-

Figure 2: First page of "A Good Time in the Army," from the Federal Writers Project.

Wickham, Hadley. "Tidy data." *Journal of Statistical Software*, vol. 59, no. 10, 2014, pp. 1-23. We will add that the term normalization is loaded and also a subject of critique.

Members of the team went through every interview and identified administrative information such as title, location, and interviewer along with the interviewee's name, age, race, date of birth, and occupation. There were also ratings given by FWP staff such as "Excellent" as well as subject tags such as "American attitude about government," "Christmas anecdotes," and "effects of Typhoid vaccine." Typically, the information would be included at the beginning of the interview or in the notes. There were instances where the metadata was not readily available and required a close reading of the interview. In some cases, the information was not available and left blank to signal that it was unknown. For the interviewers, information about their race and gender was added.

1935
Pedro Barrios (Cuban mulat
Ybor City
Tampa, Florida
(Cigar-maker and reader)
F. Valdes, writer, FERA
Sociological Survey of
Ybor City

~~LIFE HISTORY OF~~

~~MR.~~ PEDRO BARRIOS

~~By~~

~~F. Valdez~~

Interesting!
But usable?

I was born in the Cerro in Havana in 1881. That is to say that I have 54 years.

I was brought to Key West when I had 3 years; and came to Tampa from Key West when I had 13 years.

I learned the trade of cigar-maker from that time; and with the exception of a season I had as reader, I have done nothing ("na mas")(1) else but cigars. From four years to this part I have worked two or three months during the year. From there to here, I worked one month in the water line, and now I am loader of bananas when the ships come in.

My childhood and youth slipped by peacefully. I had a father who loved me very much; and died when I had 21 years; and a mother who was very affectionate with me.

Figure 3: A life history from Florida, this interview categorizes the subject as a "Cuban mulatto" which is unique for the interviews in that it acknowledges his Cuban ethnicity and mixed race, without putting him in the typical racial binary seen in interviews.

The process of converting the administrative information into metadata offered new insights.[8] Adding the data about gender revealed that the interviewers operated within the gender binary, identifying individuals as either male or female. Problematic gender relations were further inscribed through names. Many women were identified by their husband's name, rather than their own. Another issue arose when trying to label individuals within the racial binary of black and white when people did not identify as or appear to fall into one category. Along with highlighting the social categories that interviewers were working within and reproducing, the metadata elicits questions about how people perceived each other and themselves within these interviews. When adding to the analysis of how the interviews were rated and the subjects applied by the FWP staff, questions about the goals of these interviews come into focus. For example, did the FWP want stories to fit certain narratives? If so, what were these narratives? The metadata makes it easier to focus a critical lens on the FWP and the interviews in aggregate.

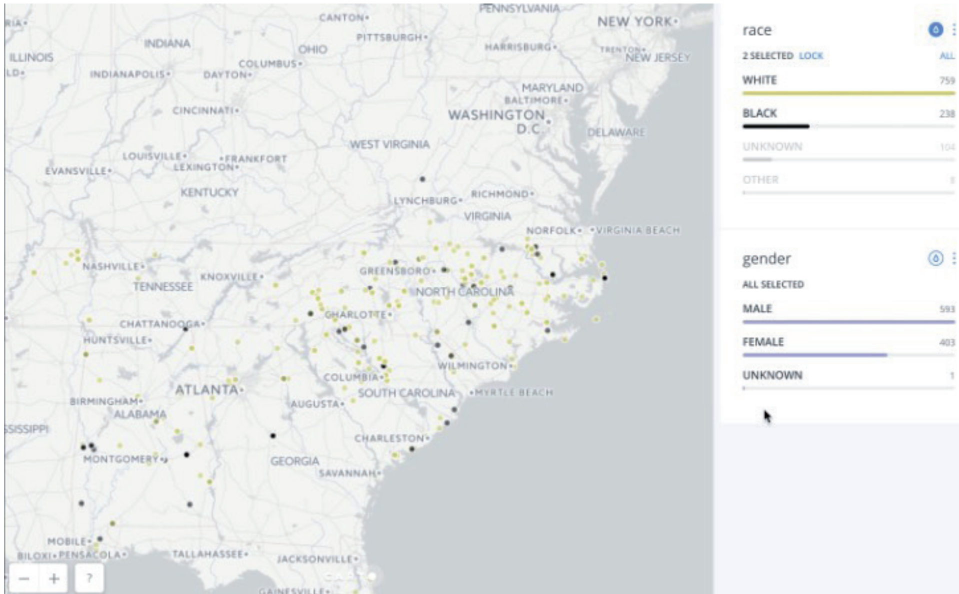


Figure 4: Example of initial spatial analysis in Carto. Due to the visualization colors, this image is best viewed in the online version of the article.

Along with the process of creating the metadata, applying digital humanities methods such as summary statistics and spatial analysis allowed for a more nuanced understanding of the FWP.[9] Applying the former reveals how most of the interviews

8 For another example from the Photogrammar team, see Arnold, Taylor, Peter Leonard, and Lauren Tilton. "Knowledge Creation Through Recommender Systems." *Digital Scholarship in the Humanities* 32.suppl_2 (2017): ii151-ii157.

9 For more on the importance of statistics to digital humanities, see Arnold, Taylor and Lauren Tilton. "New Data, New Histories: The Role of Statistics in DH." *Debates in Digital Humanities* 2019. University of Minnesota Press, 2019.

were conducted by women, all of whom were White. Applying the latter allows for faceted navigation by gender and race on a map that plots the location of each life history. Both convey the racialized and gendered categories and power relations that structured the FWP. By adding context through metadata, the project is zooming out with DH methods such as spatial analysis to understand better the cultural work of the FWP alongside providing more details for interpreting the individual life histories that offer a complex and intimate look into people's lives.

As information that describes other information, metadata becomes a way to add context for American Studies scholars. Even if one decides not to use the metadata, the process of making decisions about what should be and what can be transformed into metadata can offer analytical insights. While we worked with the grain of the archive to use metadata to better understand how racialized and gender binaries functioned, other American Studies scholars such as Jessica Marie Johnson, Lauren Klein, and Miriam Posner are forging new paths for how we can read against the grain and deconstruct these binaries including rethinking classification systems or classification at all (D'Ignazio and Klein; Posner; Johnson). Making the data available can also function as an argument about what kinds of information should be in conversation, thereby demonstrating American Studies interdisciplinary commitments. Metadata is also a meaningful way to add context when engaging in DH methods such as text and spatial analysis, which require this type of data to situate the analysis within the circumstances that shape the data being studied. While a challenge ahead is to consider how to add context that is difficult to transform into the data types recognized by a computer, just the process of trying to create metadata brings into focus how metadata engages in questions about what counts as evidence in American Studies.

Metadata as Evidence

The pursuit of American Studies inquiry often entails bringing together disparate evidence. It is a feature of the field from its origins when scholars argued that bringing together literary criticism and historical research could reveal an American culture. While the early work's production of American exceptionalism through the myth and symbol method has been well criticized, expanding the kinds of evidence and methods though interdisciplinarity remains a characteristic and practice of the field.[10] Disciplines such as Anthropology, Political Science, and Sociology are now a part of the repertoire alongside studies fields such as cultural studies and ethnic studies. Digital humanities is now another exciting addition to the analytical frames available to American Studies scholars that facilitates interdisciplinary inquiry.

A result of the field's interdisciplinarity is an expansive definition of evidence. American Studies scholars do not limit their analysis to the sources found in powerful,

10 For examples of the myth and symbol debates, see Faflik, David. "Myth, Symbol, and American Studies Methodology: The Post-National Persistence of the Humanities." *Amerikastudien / American Studies*, vol. 54, no. 2, 2009, pp. 229–247, www.jstor.org/stable/41158428; Kuklick, Bruce. "Myth and Symbol in American Studies." *American Quarterly*, vol. 24, no. 4, 1972, pp. 435–450, www.jstor.org/stable/2711683; Trachtenberg, Alan. "Myth and Symbol." *The Massachusetts Review*, vol. 25, no. 4, 1984, pp. 667–673, www.jstor.org/stable/25089609.

institutional archives or the literary canon. Rather, the field has worked hard to expand what counts as evidence, particularly kinds that have been marginalized, such as the voices of everyday people or dismissed, such as cultural forms like advertising and music. Metadata not only provides one way to organize these disparate sources, but a way to expand what counts as evidence in the field alongside assessing if the evidence is facilitating, or stifling, American Studies inquiry.

Organizing evidence as metadata brings awareness to what kinds of sources one has and, therefore, what counts as evidence. An example comes from work on the artist Banksy. In *Mapping Banksy*, Malcynsky uses spatial analysis methods to contextualize, preserve, and understand the work of popular street-artist Banksy. The goal of the project is to document and preserve Banksy's street art, foster the study

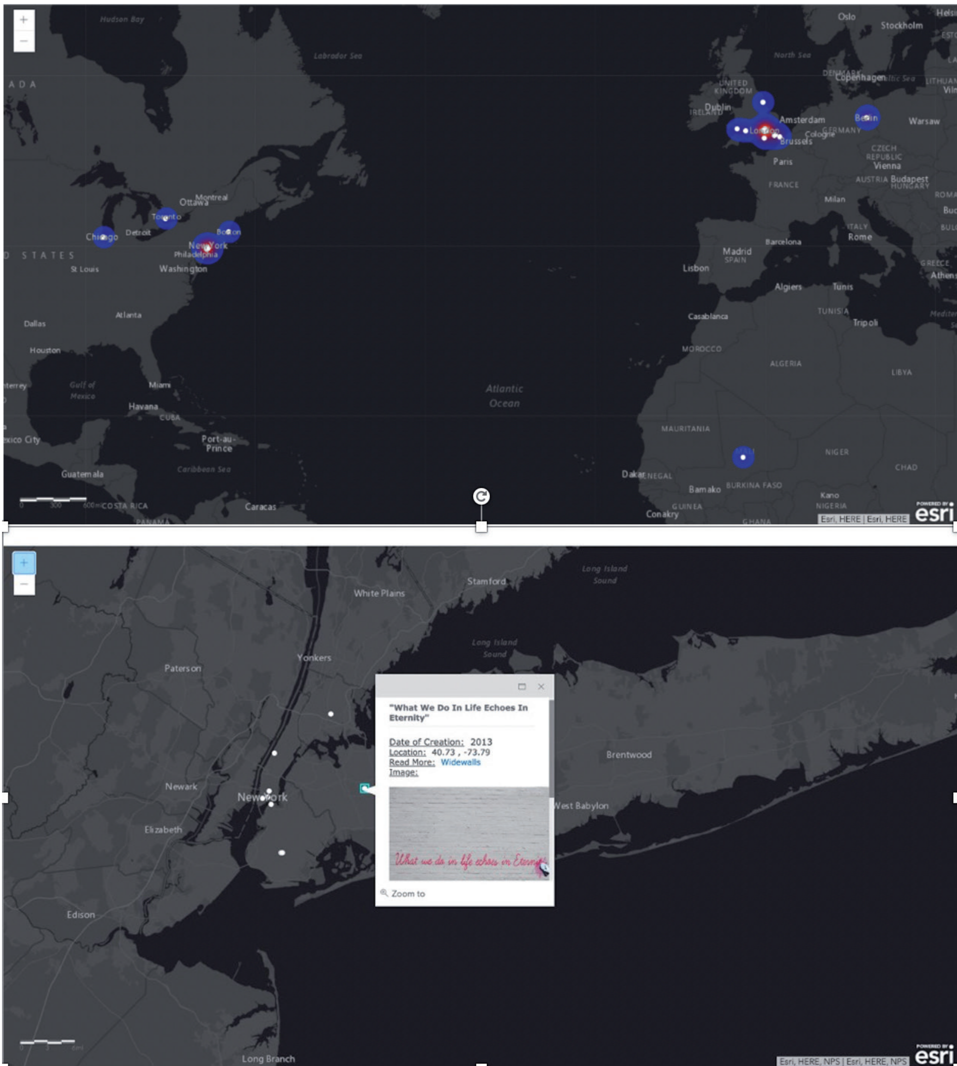


Figure 5: Screenshots from the *Mapping Banksy* project.

and analysis of Banksy's artwork and its effect on society, create a public resource for individuals to view, locate, and enjoy Banksy's urban work. Borrowing methods from the Digital Humanities, the interdisciplinary project intersects with various fields such as Art History, Communications, Cultural Studies, and Geography.

Identifying, creating, and aggregating different kinds of evidence became necessary to pursue American Studies inquiry about Banksy. The process of data collection for this project proved to be a challenge as there is no single authoritative source about Banksy's work. Due to the ephemeral and anonymous nature of the street-artist, the corpus was built around a collection of images from the official website (Banksy). While each image featured an individual artwork, Banksy rarely provided any additional information. Research was conducted primarily through reverse image searches and by searching keywords relating to the content or location of the Banksy piece. From there, a provenance for each work was pieced together and confirmed through triangulating pieces of information from multiple sources. Sources such as news articles, social media posts (with "geotags"), websites, and public research projects were used to verify the popular title, date of creation, and location of each work. The kinds of metadata quickly expanded from the title and date of artwork to placename, latitude and longitude, and related media coverage. As the process of collecting metadata revealed, Banksy's work is both prolific and transnational. While the project began with a focus on the London area, the map expanded to include over

```
<?xml version="1.0" encoding="UTF-8"?>
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<TEI xmlns="http://www.tei-c.org/ns/1.0" rend="home">
    <teiHeader>
        <fileDesc>
            <titleStmt>
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                <title type="norm">Tokyo war crimes trial, transcript of proceedings, 1946-05-15</title>
                <title type="gmd">[Electronic resource]</title>
                <author>International Military Tribunal for the Far East.</author>
                <funder>University of Richmond, Boatwright Memorial Library</funder>
                <respStmt>
                    <resp>Creation of machine-readable version: </resp>
                    <orgName>University of Richmond, Boatwright Memorial Library, Richmond, Virginia</orgName>
                </respStmt>
                <respStmt>
                    <resp>Creation of digital images: </resp>
                    <orgName>Tricom Document Management, Mumbai, India</orgName>
                </respStmt>
                <respStmt>
                    <resp>Conversion to TEI-conformant markup: </resp>
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                        <author>International Military Tribunal for the Far East.</author>
                    </titleStmt>
                    <extent>pp. 304-317</extent>
                    <publicationStmt>
                        <publisher>International Military Tribunal for the Far East</publisher>
                        <pubPlace>Tokyo, Japan</pubPlace>
                        <date>1946</date>
                    </publicationStmt>
                    <seriesStmt>
                        <title>David Nelson Sutton Collection of Japanese War Crimes Trial Documents</title>
```

Figure 6: Example of a TEI file for the trial transcript from May 15, 1946.

a hundred data points scattered across the globe: from Los Angeles to Timbuktu to a refugee camp in Calais, France. The process resulted in increased attention to sources that are often overlooked or dismissed by certain disciplines, thereby demonstrating an expanded configuration of what counts as evidence for scholarly inquiry.

Another example demonstrates how attention to metadata makes one aware of evidence that may be too circumscribed to fully engage in the kind of transnational, critical inquiry that undergirds American Studies. The *Tokyo War Crimes Tribunal Project* emerged as a way to explore the possibilities of the digital humanities to analyze a new digital collection created by the University of Richmond. The military tribunal was convened in April 1946 to try twenty-eight Japanese military and political leaders for crimes committed during World War II. The University of Richmond Law School Library invested in the creation of open-source, TEI versions of the official papers from the two-and-a-half-year trial. Exploring ways to make the documents available through a digital project, Hanglin Zhou experimented with using natural language processing to create metadata such as people, places, and organizations to facilitate a discovery interface for the thousands of pages of trial transcripts. For example, a user can search a person's name to find their testimony or search for a place name to read more about the war crimes that occurred.

While these were possibilities for creating a project designed to facilitate access to an archive, questions emerged about how to develop this into an American Studies project, given the scope of the evidence. As official government documents, the data and metadata were all produced from government documents and therefore risked replicating significant absences in the trials such as Allied prosecutors' decision not to hold Japanese leaders accountable for the violence against women perpetrated through sexual slavery (Totani 14). The attention to the data and metadata brought to the fore questions about what other kinds of metadata and data would be needed to engage in the kind of critical inquiry demanded by American Studies. The team decided that relying only on official government documents from one source was not sufficient and began the process of deciding if, and how, to add more context through metadata from other sources.

The two examples demonstrate how metadata draws attention to the kinds of evidence used in American Studies inquiry. Metadata not only offers an exciting way to bring together disparate forms of evidence together, but it can also serve as a reflection and argument about what counts as evidence in the field. A part of the power of American Studies is how the interdisciplinary stance makes space to put disparate sources into conversation. Such unconventional decisions, from a disciplinary perspective, often result in innovative new scholarship precisely because the pairing and comparisons result in analyzing a topic from a different angle. Expanding what counts as evidence in American Studies to metadata itself is in line with the field's commitments.

Metadata as Method

A characteristic of interdisciplinary fields is that they combine methods. American Studies is so well versed in combining methods that debates ensue about whether American Studies should, could, or has developed its own method (Attebery; Tate).

While the need for continuing such debates is an open question, they are evidence of the field's openness to testing, experimenting, and adjusting new and existing methods. Among the latest methodological additions is the digital humanities.

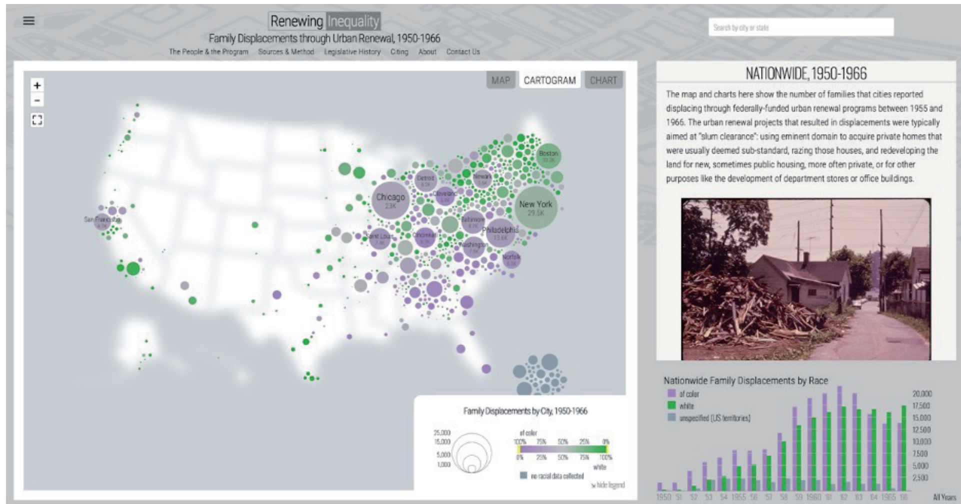

Figure 7: Landing page of *Renewing Inequality* (dsl.richmond.edu/panorama/renewing)

Conceptualizing metadata as evidence in American Studies opens up a plethora of analytical approaches from the digital humanities. The range is wide. Examples include digital archives such as *Chicana Por Mi Raza* (https://chicanapormiraza.org), network analysis such as *Viral Texts* (https://viraltexts.org), and spatial analysis such as *American Panorama* (http://dsl.richmond.edu/panorama/).[11] All rely on the creation of metadata. While *Chicana Por Mi Raza* relies on descriptive metadata to build an archive of documents related to Chicanx social movements during the long civil rights movement to argue for the importance of these histories, *Viral Texts* uses metadata to visualize networks that reveal which newspapers reprinted the same texts as a way to study reprinting in the 19th century. American Panorama's *Mapping Inequality* (http://dsl.richmond.edu/panorama/redlining) and *Renewing Inequality* (http://dsl.richmond.edu/panorama/renewal) use geospatial metadata to reveal the racialized spatial inequalities that shaped the 1930s housing policies and 1960s urban development in the United States. By adding the digital humanities to the methodological repertoire of American Studies, the field adds a slew of interdisciplinary methods to pursue scholarship. Returning to the examples of Banksy and the Federal Writers Project (FWP) further demonstrates the methodological possibilities opened up by metadata for American Studies.

11 To explore these projects, visit Chicana Por Mi Raza at https://chicanapormiraza.org, Viral Texts at https://viraltexts.org, and American Panorama at https://dsl.richmond.edu/panorama. For additional projects, see the *American Quarterly* Digital Humanities Special Issue Digital Projects: Tilton, Lauren, et al. "Digital Projects Introduction." *American Quarterly*, vol. 70 no. 3, 2018, p. 589-591. Project MUSE, doi:10.1353/aq.2018.0036.

In *Mapping Banksy*, decisions about which methods to use and, therefore, which metadata to create was an iterative process. Historically, urban art has been widely ignored in the world of academia (Cowick 29-44). This is problematic, as the short-lived nature of urban art makes it difficult to document or study retroactively. One preservation solution has been to take an image of the work and make it available digitally (Lang and Ommer). Yet, an image with a description limits the analytical possibilities. A priority for the project was to add spatial context to the images in a way that conveyed to viewers the importance of space and place to interpreting the meaning of the images.

Urban artwork is created within, and in conversation with, the built environment (Young). Street artists, such as Banksy, not only incorporate the urban landscape into their compositions but also often make commentaries on such environments through their work. Therefore, space and place become integral parts of the artwork itself. Borrowing methodologies and digital tools forged by fields such as geography, methods such as mapping through GIS (geographic information systems) provide a way to visually communicate the spatial context of an artwork. By adding latitude and longitude, each artwork is mapped to a location. Users on *Mapping Banksy* can select the piece of art, see an image of the work, and see where in the city the piece of art was created, providing valuable context. Further, the temporal context is provided through metadata on the date of creation. In aggregate, the metadata anchored the piece in the specific temporal and spatial context in which the artworks were intended to be viewed and interpreted. Archival evidence, namely news articles, were included as links in the metadata to provide historical and cultural context to the artwork, such as audience reception. Additional context was added through digital storytelling tools such as Timeline.js. Thinking through method and metadata became an iterative process that resulted in an ever-expanding definition of evidence, which in turn enabled combining methods to further understandings of the cultural and political work of Banksy.

Like *Mapping Banksy*, the *Photogrammar* project went through a similar process. After converting each life history to machine-readable text in plain text files, the analysis could turn to text analysis methods such as topic modeling to identify themes across the interviews, such as women's labor and the civil war. Given that the interviews took place during segregation, the team was interested in how race and gender shaped the life histories through the rhetorical strategies used by interviewers and interviewee. An analysis using natural language processing required creating metadata on race, gender, and geography to explore patterns, trends, and outliers.[12] Metadata, therefore, became a way to add nuance and evidence as well as determine which methods could be used for American Studies inquiry.

12 We do recognize that there are drawbacks of using problematic binaries for categories such as gender. There is also important critical work on the stakes of datafication for particular subjectivities and histories. For more on how we need to rethink these categories, see Cifor, M., Garcia, P., Cowan, T.L., Rault, J., Sutherland, T., Chan, A., Rode, J., Hoffmann, A.L., Salehi, N., Nakamura, L. (2019). "Feminist Data Manifest-No". Retrieved from: https://www.manifestno.com/; D'Ignazio, Catherine, and Lauren F. Klein. *Data Feminism*. MIT Press, 2020; Posner, Miriam. "Humanities data: A Necessary Contradiction." Miriam Posner's Blog (2015). Johnson, Jessica Marie. "Markup Bodies: Black [Life] Studies and Slavery [Death] Studies at the Digital Crossroads." *Social Text*, vol. 26 no. 4, 2018.

As both examples show, attention to the kinds and forms of metadata become important because they will shape which digital humanities methods are possible. Metadata brings context to the analysis, but the form of the metadata will define which kinds of analysis can use metadata as context and, therefore, evidence. The same limits hold for digital humanities more broadly. Like metadata, certain digital humanities methods will and will not facilitate other important theoretical and methodological approaches such as reading against the grain, queering, and interrogating power. Interdisciplinary inquiry is about assessing when and when not to use specific methods.[13] Engaging with the methodological possibilities of metadata is another way to explore the possibilities of American Studies inquiry.

Metadata by Whom

Metadata as context, evidence, and method is a practice for American Studies as well as necessary commitment. A hallmark of the field is the interrogation of power. One focus is on how structural inequality through institutions continues to shape which groups of people are empowered and disempowered. Among the growing sites of critique is who gets to create, own, access, and share data. Attention to metadata is one way to forge American Studies-inflected digital humanities that challenges the structures of power controlling the creation of data.

As the open-access movement argues, the creation and ownership of data by multinational for-profit corporations comes at a high cost.[14] These companies often take materials in the public domain and put them behind a paywall, and these companies are also literally costing institutions of higher education hundreds of millions of dollars. As intersectional feminist and anti-racist critiques argue, these companies also show little concern for the subjects of that data, who have little to no control over how information about them is created, used, and shared, as well as those who create the data (Cifor, Garcia, Cowan, Rault, Sutherland, Chan, Rode, Hoffmann, Salehi and Nakamura). Such power dynamics are deeply troubling and one that American Studies can actively dismantle by creating metadata with our commitments built-in.

As all of the projects above demonstrate, attention to power is essential.

13 For more on the wide range of theoretical frames that are used in American Studies, see Burgett, Bruce and Glenn Hendler, ed. *Keywords for American Cultural Studies*, NYU Press, 2014; Deloria, Philip J., and Alexander I. Olson. *American Studies: A User's Guide*. University of California Press, 2017.

14 The open data movement is not field or discipline specific. Rather, it is a call for data that is freely available to the public without restrictions. Subsets have included calls for linked open data (LOD) and open research data (ORD). Examples include projects like the Linked Open Data Cloud (https://lod-cloud.net/#about) and EU Open Data Portal (https://data.europa.eu/euodp/en/home). For more on calls for those engaged in the digital humanities to get involved in creating data, see Borgman, Christine. "The Digital Future is Now: A Call to Action for the Humanities." *Digital Humanities Quarterly*, vol. 3, no. 4, 2009; Rawson, Katie and Trevor Muñoz. "Against Cleaning." *Debates in the Digital Humanities* 2019, edited by Matt Gold and Lauren Klein, University of Minnesota Press, 2019; Edmond, Jennifer and Erzsébet Tóth-Czifra. "Open Data for Humanists, A Pragmatic Guide." 2018. Halshs-0211544; Institute of Museum and Library Services supported Always Already Computational: Collections as Data project team. "The Santa Barbara Statement on Collections as Data." 2017, https://collectionsasdata.github.io/statement/.

Projects like *Mapping Banksy*, *Mapping Inequality*, and *Photogrammar* provide the metadata open access and in non-proprietary formats such as comma-separated value files. *Mapping Banksy* includes a data dictionary to make explicit the decision process behind the metadata. The *Tokyo War Crimes Tribunal Project* is based on investment from a university library to create open access data rather than turning the materials over to and depending on a for-profit vendor. *Viral Texts* is a testament to the possibilities of large scale open data provided by public institutions. *Chicana Por Mi Rasa* offers tiers of access, indicating attention to questions around ownership, extraction, and audience given the long histories of political, social, and material colonization of marginalized peoples by powerful institutions. Rather than adopt the open access movement wholesale, all of these projects indicate how attention to power relations when creating, using, and distributing metadata must be taken into account.

Creating, analyzing, and critiquing metadata can be one way that American Studies reveals and challenges powerful institutions. Leaving our access to data to multinational corporations such as Google or ProQuest or engaging in problematic data harvesting practices means that we often rely on data that is created and structured in ways that either hinder or at odds with our areas of study. The labor and exploitation behind much of this data is also antithetical to the commitments of our field. Questioning who is empowered by knowledge production through metadata and reclaiming these practices and structures should be a commitment of the field.

Conclusion

There remain a plethora of reasons to be cautious about the use of metadata. Creating metadata risks participating in datafication, which is inculcated in potentially exploitative capitalist logics of value (Zuboff). Producing more data risks co-optation from powerful actors and institutions (Boyd and Crawford). The histories that shape which people become data for quantification and by whom is often overlooked and fraught (Johnson). Such concerns need to be front and center. The history of American Studies and current directions of scholarship all signal that the field is well-positioned to think through these issues while participating in the digital humanities.

While caution and critique are intrinsic to American Studies, digital humanities cannot be simply dismissed as a reduction of inquiry or project of neoliberalism. Instead, digital humanities brings another set of methods to American Studies. Not only do many digital humanities methods require metadata, but the process of collecting, creating, and sharing metadata can add context and nuance, expand what counts as evidence, and facilitate the kind of critical inquiry that animates the field. It can also be a proactive way to take back power from the structures of corporate capitalism and neoliberalism. Metadata can be a practice, method, and outcome of American Studies.

Works Cited

Attebery, Brian. "American Studies: A Not so Unscientific Method." *American Quarterly*, vol.48, no. 2, 1996, pp. 316–343.

Banksy. *Banksy*, banksy.co.uk.

Boyd, Danah, and Kate Crawford. “Six provocations for big data.” *A decade in internet time: Symposium on the dynamics of the internet and society*. U of Oxford, 2011.

Cifor, Marika, Patricia Garcia, T.L. Cowan, Jasmine Rault, Tonia Sutherland, Anitta Say Chan, Jennifer Rode, Anna Lauren Hoffmann, Niloufar Salehi, and Lisa Nakamura. *Feminist Data Manifest-No*, 2019. Retrieved from: https://www.manifestno.com/.

Cowick, Carmen. “Preserving Street Art: Uncovering the Challenges and Obstacles.” *Art Documentation: Journal of the Art Libraries Society of North America*, vol. 34, no. 1, 2015, pp. 29-44.

D’Ignazio, Catherine, and Lauren F. Klein. *Data Feminism*. MIT Press, 2020.

Deloria, Philip J., and Alexander I. Olson. *American Studies: A User’s Guide*. U of California Press, 2017.

Gruez, Kirsten Silva. “America.” *Keywords for American Cultural Studies*, edited by Bruce Burgett, and Glenn Hendler, NYU Press, 2014.

Johnson, Jessica Marie. “Markup Bodies: Black [Life] Studies and Slavery [Death] Studies at the Digital Crossroads.” *Social Text*, vol. 26, no. 4, 2018, pp. 57-79.

Kelly, R. Gordon. “Literature and the Historian.” *American Quarterly*, vol. 26, no. 2, 1974, pp. 141–159.

Lang, Sabine, and Björn Ommer. “Urban Art in a Digital Context: A Computer-Based Evaluation of Street Art and Graffiti Writing” (abstract), Mexico City: DH2018.

Marx, Leo. “Thoughts on the Origin and Character of the American Studies Movement.” *American Quarterly*, vol. 31, no. 3, 1979, pp. 398–401.

Nowviskie, Bethany. “Capacity Through Care.” *Debates in the Digital Humanities 2019*, edited by Matt Gold, and Lauren Klein, University of Minnesota Press, 2019.

Posner, Miriam. “Humanities Data: A Necessary Contradiction.” *Miriam Posner’s Blog* (2015).

Rawson, Katie and Trevor Muñoz. “Against Cleaning.” *Debates in the Digital Humanities 2019*, edited by Matt Gold and Lauren Klein, University of Minnesota Press, 2019.

Rivard, Courtney, Arnold Taylor, and Lauren Tilton. “Building Pedagogy into Project Development: Making Data Construction Visible in Digital Projects.” *DHQ: Digital Humanities Quarterly*, vol. 13, no. 2, 2019.

Smith, Henry Nash. “Can *American Studies* Develop a Method?” *American Quarterly*, vol. 9, no. 2, 1957, pp. 197-208.

Tate, Cecil F. “The Search for a Method in American Studies.” NED – New Edition, Universityof Minnesota Press, 1973.

Totani, Yuma. *The Tokyo War Crimes Trial: The Pursuit of Justice in the Wake of World War II*. Brill, 2020, pp. 14.

Young, Alison. *Street Art, Public City: Law, Crime and the Urban Imagination*. Routledge, 2014.

Zuboff, Shoshana. *The Age of Surveillance Capitalism: The Fight for a Human Future at theNew Frontier of Power*. Profile Books, 2019.

Colin Wilder, Sam T. McDorman, Jun Zhou, Adam King, Yuhang Lu, Karen Y. Smith, Song Wang, and W. Matthew J. Simmons[1]

Snowvision: The Promise of Algorithmic Methods in Southeastern Archaeological Research

Abstract: This article presents the contexts, methods, contributions, and preliminary findings of Snowvision, a digital archaeology project developed by faculty and students at the University of South Carolina and the South Carolina Department of Natural Resources. Snowvision uses computer vision to reconstruct southeastern Native American paddle designs from the Swift Creek period, ca. 100-850 CE. In this essay, we first present the context of the Swift Creek culture of the southeastern United States, along with broader related issues in prehistoric archaeology. Then, the relevant methods from archaeology and computer vision are introduced and discussed. We also introduce World Engraved, our public-facing digital archive of sherd designs and distributions, and explain its role in our overall project. We then explore, in some level of technical detail, the ways in which our work refines existing pattern-matching algorithms used in the field of computer vision. Finally, we discuss our accomplishments and findings to date and the possibilities for future research that Snowvision provides.

Keywords: Pottery, computer vision, Native Americans, archaeology, Southeastern United States, pattern-matching, algorithmic methods

The American archaeological record is filled with fragmentary objects of bone, pottery, shell, stone, wood, and cloth variously embellished with realistic and abstract designs. These designs include figural imagery, like that seen on ancient Mayan pottery, and the abstract carvings found on marine shell gorgets amongst the Mississippian peoples of the eastern North American Woodlands. Humanities and social science scholars have put the variety of these designs to many uses. They can be used to assign dates to objects and places, trace ancient trade routes, understand ancient creative processes, and explore how images were used to create personal and collective identities. Without question, most of these topics are best addressed using complete designs rather than design fragments. As a result, the millions of broken cultural heritage objects stored in museums remain largely unstudied from a design perspective, and large numbers of decorated objects found in the archaeological record contribute little to our understanding of style, production, use, and meaning.

Many such partial designs are today found only as intricate impressions stamped onto the surfaces of pottery sherds recovered from archaeological sites in what are now the US states of South Carolina, Tennessee, Georgia, and along

1 The Snowvision project has been a collaborative effort from its inception. For transparency regarding contributions to this article and to the project described herein, we recognize the following roles, adapted from the CRediT taxonomy (Brand, et al.): Project Conceptualization, K.Y.S., S.W., and C.W.; Article Conceptualization: C.W.; Software, J.Z. and Y.L.; Investigation, J.Z., Y.L., and S.T.M.; Writing – Original Draft, S.T.M., J.Z., K.Y.S., A.K., C.W.; Writing – Review & Editing, W.M.J.S., S.T.M., C.W., and K.Y.S.; Funding Acquisition, K.Y.S., S.W., C.W., J.Z., and A.K.; Data Curation, S.T.M. and Y.L.; Supervision, S.W., K.Y.S., and J.Z.

the Gulf Coast of southeastern North America. This ornate decorative style, known amongst American archaeologists as "Swift Creek Complicated Stamp," was produced throughout southeastern North America between ca. 100-850 CE. These designs, several of which are shown in their reconstructed form in Figure 1, represent one of the most significant indigenous decorative traditions of the Americas. They were produced by artisans using wooden paddles with raised carvings to "stamp" wet clay. Many southeastern archaeologists have long recognized that complete paddle designs could be reconstructed from fragmentary impressions on potsherds. By the 1950s, these archaeologists also began to realize the remarkable fact that certain unique paddle designs were widely distributed across the region, sometimes on archaeological sites hundreds of kilometers apart (see Figure 2). Thus, by studying the spatial distribution of paddle designs, once reconstructed and mapped, archaeologists could gain unprecedented insight into the pre-colonial social networks of ancient North America.

Our project, Snowvision, is named for a pioneer in the study of Swift Creek pottery, the artist and researcher Frankie Snow. Launched in 2016, Snowvision's founding purpose was to investigate the possibilities of using computer-vision technologies to analyze fragmentary sherds in order to reconstruct, and thereby study, southeastern Native American carved wooden paddle designs and the extent of their geographical spread. Understanding how widespread these designs were will give unprecedented insight into the social and economic networks of the pre-colonial southeast.

Archaeological Context and Survey of Scholarship

Pottery is ubiquitous on many archaeological sites. This ubiquity speaks to the tremendous utility and malleability of pottery as a container for processing, storing, and consuming commodities—mainly food stuffs—across human societies. Pottery also can be shaped and modified to convey subtle aspects of social life, both individual and group, such as social status and affiliation. Studying pottery, especially how it was made and decorated, can help archaeologists understand the movements, connections, foodways, technologies, and cultures of people who existed hundreds or thousands of years ago.

Identifying *stylistically defined* types of pottery allows archaeologists to apply relative dates to sites based on the technology and decoration utilized for and on the vessels. The ceramic traditions of southeastern North America are well established in archaeological literature and are defined both by technology and decorative style. The earliest tradition, Stallings, began around 2,450 BCE and is represented by large, hand-build, fiber tempered vessels found along the Savannah River from the Coastal Zone into the Piedmont (Sassaman 400). By 450 BCE, taller, coil-built, non-fiber temper pottery was made and used virtually everywhere in the Southeast (416). The walls of coil-built vessels were thinned using an anvil stone and wooden paddle to seal the coils together, and the paddles were often carved with parallel or perpendicular lines or wrapped with cordage that left impressions on the exterior of the vessel.

Around 100 CE, the paddle carvings changed to more intricate, curvilinear designs that incorporated many kinds of shapes and symmetries—this was the beginning of Swift Creek Complicated Stamp. This type of pottery was produced throughout the southeast until 850 CE (Williams and Elliott 1). Swift Creek pottery is abundant across the present-day US states of Georgia and the Gulf Coast of Florida, and likely originated in this region (Chase 51). Swift Creek designs found on types with different temper or production techniques, including Santa Rosa-Swift Creek in the western Florida panhandle, middle Woodland Pickwick Complicated Stamped wares in Tennessee, and Mann Complicated Stamp in Indiana, demonstrate the edges of Swift Creek influence (Chase 50, 55-56; Elliott 21; Smith, B.A. 112). While complicated stamped ceramic vessels continued to be produced into the historic period by some indigenous peoples, including potters of the Cherokee and Muscogee Nations, the complexity and variety of designs is greatest during the Swift Creek period.

Modern Swift Creek research would not be possible without the paddle design reconstruction work done by Bettye J. Broyles and Frankie Snow, our project's namesake. Since the wooden paddles do not survive in the archaeological record, both artists pieced together designs from fragments of vessels, called sherds, to reconstruct the original paddle carving. The work of both artists show that one design can be found at multiple *sites*, indicating connections between settlements.[2]

The work of Broyles and Snow illustrated connections between many sites across multiple states. Broyles's work focused primarily on sites around eastern Tennessee and the Chattahoochee River bounding Georgia and Alabama, and in 1968 she published more than 80 full design reconstructions with dozens of partial design fragments that primarily focused on connections between Fairchilds Landing (9SE14), Kolomoki (9ER1), and Quartermaster (9CE42)[3]. Broyles maintained

2 Archaeologists use this concept of the *site* to organize, analyze, and discuss places of past human occupation and use. Archaeological sites can represent the locations of former camps, hamlets, villages, towns, cities, farms, plantations, or any number of other human social units. Sites tend to have spatial boundaries determined on the basis of the distribution of artifacts and features, both above and below ground. Thus, archaeological sites and the data gleaned from them are inherently spatial, as human behavior is inherently spatial. Because of this, significant effort is put into recording the locational information of sites and artifacts.

To register sites' locational information, archaeologists in the United States decades ago developed a standardized, state-based system, called State Archaeological Site Files. Here, sites are given a unique identifier based on a numbering system produced by the Smithsonian Institute. This identifier is further tied to both the site's geographical location as well as a limited set of additional site attributes, the details of which vary by state. However, although site locations are an important data point for the archaeologist, the exact location of a site is often legally restricted, ethically restricted, or both, so as to protect the site from damage or plunder and to respect the culturally-sensitive nature of many sites. If the site is on federal land, the exact site location is protected information under federal law. Archaeological site locations should not be disseminated through any means other than through the state archaeological site files or through permission of the landowner.

3 The alphanumberic codes in parentheses indicate the aforementioned state archaeological site file identifier for the named site.

hundreds more unfinished designs in her personal collection; these were scanned by the University of Georgia's Laboratory of Archaeology and generously shared with our team.

Snow's work has concentrated on central Georgia, specifically Hartford (9PU1) and the Ocmulgee-Big Bend region, and he has published a selection of designs for these areas (Snow, "An Archaeological Survey…"; "Swift Creek Design Investigations"). However, Snow has reconstructed more than 400 designs from sites across Georgia, many of which remain unpublished and therefore inaccessible to anyone outside of Swift Creek research. Snow has graciously allowed all his designs to be used in developing the Snowvision algorithm.

Building on this corpus of design work, researchers are exploring many facets of the Swift Creek period through the study of this ornate pottery. Broadly, changes in vessel production and style across time and space can be used to understand changes or regional differences in foodways, technology, and society (Sassaman). The uniqueness of Swift Creek designs allows for a more nuanced understanding of the movements and connections of the people who created the vessels. This is especially true inasmuch as studies of stylistic variability have highlighted the fact that Swift Creek designs show a level of uniqueness and creativity that was unmatched in subsequent eras (Smith, K.Y. and Knight, "Style In Swift Creek Paddle Art"; "Swift Creek Paddle Designs").

Investigation of design symmetry at the site level is well-established as a means of exploring the relationship between pottery designs and social trends. For example, Pluckhahn has analyzed differences in design symmetry between artifacts recovered from Swift Creek-era villages and the sacred earthen mounds spaces often found near them, suggesting different sociocultural valences for different designs (Pluckhahn). Wallis, meanwhile, has studied how analysis of the composition of materials—whether the source of the ceramics are local or non-local—can be used to demonstrate the presence of networks of exchange across geographical areas, possibly as gifts tied to sociocultural rituals (Wallis). Many researchers have acknowledged the need for more site-specific research on design distribution and variability to answer questions about settlements interactions, to produce more precise chronologies, and to study if changes in worldviews and/or cosmologies are reflected in ceramic technology and how those changes may have influenced groups and trade networks (Anderson 299).

Overview of Snowvision

Snowvision arose from a conversation between Swift Creek researchers Karen Y. Smith and Scot Keith; Colin Wilder, Associate Director of the University of South Carolina's Center for Digital Humanities, and Song Wang, Professor of Computer Science at UofSC, joined the collaboration soon after. The now eight-member team includes faculty, staff, and students from the fields of archaeology, digital humanities, research computing, information science, and computer vision. After four years of intensive sherd data collection and algorithm development, we have reached our first milestone: sherd-to-design matching. This work has been supported by the

United States government, via the National Center for Preservation Technology and Training, the National Science Foundation, and the National Endowment for the Humanities.[4] The goal of the current NEH grant is to link the Snowvision algorithm to World Engraved (http://www.worldengraved.org), a publicly-accessible digital repository that allows researchers to contribute sherd and design content, enabling the expansion of the database. World Engraved also allows for researchers to submit 3D scans to the backend for algorithm matching and training, helping to improve the precision and accuracy of the Snowvision algorithm.

This accomplishment has raised additional challenges. First, archaeological datasets that are publicly accessible must take legal and ethical standards related to site location into consideration. However, in order to facilitate our research goal of illustrating the distribution patterns of various paddle designs—and thus to describe the social and economic networks of the Swift Creek era—the Snowvision database needs to accommodate, store, and deliver spatial data linked to the sherds on which Swift Creek designs are found. Yet, because of legal and ethical concerns, we must to be cautious with how we display location information on World Engraved. Our solution is to only deliver site geographic locations at a gross-level via the map function on the World Engraved website. World Engraved also provides the registered site number, when that is available. The site number can be used by researchers to access specific site locations by requesting such information from the respective State Archaeological Site Files. Even if the exact site location is not part of the delivered dataset, it is still analytically profitable to know that several designs are found on a single site or that one design is found on several different sites.

Our work has used two other existing datasets to guide our metadata-collection methodology: the Digital Index of North American Archaeology (DINAA) and the Archaeometry Laboratory at the University of Missouri Research Reactor (MURR). DINAA aggregates state site file information into a publicly accessible and digestible form. Like World Engraved, DINAA protects the exact location, but makes available other site attributes. Using similar site attributes coded in similar ways ensures the discoverability of our data delivered on World Engraved by the users of DINAA, and vice versa. MURR is a research laboratory that specializes in the compositional analysis of pottery sherds and other materials from archaeological sites around the world. We based our sherd submission template in part on that of MURR, in order to facilitate interoperability among the attributes collected.[5] Connecting compositional data with design and sherd data generated by Snowvision is an important facet of the research. Our project thus improves the ability of scholars to discover paddle design matches within

4 The work described herein was supported by a one-year National Center for Preservation Technology and Teaching grant awarded in 2016 and a two-year National Science Foundation grant (#1658987) awarded in 2017. In 2019, the team was awarded a two-year National Endowment for the Humanities Digital Humanities Advancement Level III grant (HAA-266472-19) to deliver Snowvision to researchers and the public through World Engraved.

5 It is possible that some sherds in our Snowvision database may also be in MURR. We cannot be certain. Exclusivity is not an issue as far as we are aware.

and across sites. Ultimately, this helps archaeologists reconstruct how foragers organized and moved across the landscape 1,500 years ago.

Our algorithmic approach also enables us to study the position or rotation of the paddle relative to the vessel. From this, we can begin to infer the handedness of potters (Sassaman and Rudolphi; Vidal). Our approach also helps us classify paddle designs. Classification helps the archaeologist sort designs by time period. Classification also has the potential to identify individual paddle makers or communities of paddle makers that share the same stylistic conventions and, by inference, are members of the same learning or practice groups. Although classification and handedness studies could be done manually, our computational approach expedites such inquiries across a large dataset and, we contend, should remove bias in the classification process. Identifying design communities through classification and handedness studies are novel contributions of our work.

The late Bettye J. Broyles may well have been the first archaeologist to expand on the idea that certain paddle designs were widely distributed across the lower Southeast, sometimes separated by hundreds of kilometers (Broyles; Holmes; Snow "Swift Creek Designs and Distributions," "Kolomaki and Milamo," "Swift Creek Design Innovations"; Snow and Stephenson; Wallis and O'Dell). From this realization was borne interesting, novel research possibilities that Swift Creek scholars have sought to address ever since. For his part, Snow ("An Archaeological Survey") noted a high number of Swift Creek design matches among sites within the big bend area of the Ocmulgee River (known as Ocmulgee-Big Bend) and between the Ocmulgee-Big Bend and the headwaters of the Satilla River to the south. These matches occurred within an approximately 48 km radius, providing, he argued, clues to settlement patterns within the region. He also noted a more limited number of design matches between those sites and sites much further to the northwest, southwest, and southeast, well outside of the Ocmulgee-Big Bend region. These longer-distance, inter-regional, matches suggest another kind of social process at work, perhaps long-distance expeditions to larger communities of aggregation for information and resource collection.

Documenting design connections across household deposits within a village site also holds research promise and is strong motivation for studying sherds and designs. Saunders examined Swift Creek designs in individual household middens at the Kings Bay site, Georgia ("Attribute Variability"). Personal communication from 2015 shows that Snow and Stephenson studied designs among individual middens at the Hartford site, Georgia. Both Saunders and Snow and Stephenson identified paddle design connections that linked each household trash deposit to one or more deposits across their respective study sites (Saunders; Snow and Stephenson). Smith and Knight have taken these patterns to indicate that paddle production and use operated independently of pottery discard, but further data is needed to test this idea (Smith, K.Y. and Knight, "Swift Creek Paddle Designs" 127).

Using instrumental neutron activation analysis—a method of analyzing the composition of ceramics—to source the geographical provenance of clays, Wallis documented instances in which Swift Creek vessels—whole pots, not sherds—

apparently moved great distances ("The Swift Creek Gift"). Among the vessels he analyzed, Wallis found that Swift Creek vessels from mortuary mounds on the lower St Johns River, Florida, were made with non-local clays, whereas Swift Creek vessels from residential sites in the same area were made with local clays (114). Many vessels of nonlocal origin may have come from sites much further up the Atlantic Coast. Wallis's argument about the long-distance movement of pots found in mortuary contexts was bolstered by independent evidence related to paddle design matches among sites.

The Snowvision project, both in our algorithm and the use of World Engraved as data-sharing repository for archaeologists, thus complements existing research and provides new possibilities for expanding these research methods. As noted, the core of our project is a robust matching algorithm based on cutting-edge computer vision technology.

Computer Vision Methods

Computer vision research offers an array of recently developing methods which complement the efforts of archaeologists by harnessing technology to achieve archaeological goals and deal with challenges posed by the necessarily fragile nature of archaeological materials.

Computer-aided identification of the designs from fragmented cultural objects has attracted great interest among archaeologists and computer scientists in recent years (Halíř; Kampbel), and the Snowvision project develops a new framework to identify the underlying carved wooden paddles impressed on pottery from the Carolinas to the Gulf Coast. To illustrate the value of computer vision technology to Swift Creek research, let us consider a case study of the elaborately carved wooden paddles of the southeastern Woodlands and the ornate curvilinear paddle impressions on countless pottery sherds of the Swift Creek style, as shown in Figure 3.

Identifying the full curvilinear paddle design from fragmentary sherds is challenging. First, each sherd only contains a small portion of the underlying full paddle design. Second, the available sherds rarely come from the same vessel, and it is difficult to assemble them into large pieces for more complete curve patterns. Third, one carved paddle will be applied multiple times on the vessel surface with spatial overlap. As a result, curve patterns detected on sherds may be incomplete or very noisy[6] due to both the gap when applying a planar carved paddle onto a curved pottery surface and the erosion of sherd surfaces over centuries. Furthermore, a sherd may contain a composite pattern—a small fragment of multiple, partially overlapping copies of the same design, as shown in Figure 3(b). Such a composite pattern is not simply a portion of the full design.

To address the above challenges, we have used the findings of recent computer vision research to develop a new framework for identifying carved paddle designs from pottery sherds. An overview of the process is given here,

6 "Noise" is here (and subsequently) meant in the sense in which it is commonly used in computer science—irrelevant or meaningless data that obscures computational analysis.

with technical details spelled out in subsequent paragraphs. Broadly speaking, we extract the curve pattern from a sherd and then match it to each known design in a database and return the best matched design. As shown in Figure 4, this is done over three iterative steps: 1) extract a curve pattern from a sherd, 2) identify the underlying design for a sherd with a non-composite (single) pattern, or 3) identify underlying design for a sherd with a composite (multiple) pattern. Building on the research of Long, Shelhamer, and Darrell, we extract curve patterns using a fully convolutional neural network (Long, et al.). These FCNN-based curve pattern segmentation methods form a digitized sherd's depth map and then match the sherd with a non-composite pattern by combining a template-matching algorithm with a dual-source convolutional neural network, building on the work of Krizhevsky, Sutskever, and Hinton (Krizhevsky, et al.). The CNN re-ranking algorithm then finds the sherd's underlying design, or matches it with a composite pattern, using a new Chamfer matching algorithm, per the methods demonstrated by Zhou, Yu, Smith, Wilder, Yu, and Wang (Zhou, et. al.).

To state the process differently: given a pottery sherd, the first step of our framework is to extract curve pattern from this sherd. Generally speaking, extracting a curve pattern from the surface of a sherd is a low-level image segmentation problem of the sort typical in computer vision research. However, erosion and sediment usually make the visibility of the curve pattern on the sherd very weak and blurred, which substantially increases the difficulty in accurately segmenting them. Early in the development of our algorithm, we used the excavated pottery sherds associated with the Woodland period Swift Creek type for experiments and found that it is very difficult to extract these curve patterns from the camera-taken images of these sherds. Given that these curved patterns are stamped on the surfaces of pottery vessels by carved paddles, these patterns usually show greater depth than the adjacent non-curved surface. Therefore, 3D scanners are usually applied to achieve the 3D depth image of the sherd surface, as illustrated in Figure 5, and the curve patterns are then segmented directly from the depth image.

However, due to erosion from being buried under the earth for centuries, together with possible shallow stamping or deliberate smoothing when making the vessel, the curve patterns can still be difficult to segment even from the 3D-scanned, high-resolution depth images. Snowvision team members developed a CNN-based algorithm to more accurately and reliably segment the stamped curve patterns from the depth images of the sherds, by learning and incorporating the implied curve geometry, such as curve smoothness and parallelism, in the underlying designs (Lu, et al.). In other words, we deal with these challenges by training an FCN to detect the skeletons of the curve patterns in the depth images. Then, we train a dense prediction convolutional network to identify and prune false positive skeleton pixels. Finally, we recover the curve width by a scale-adaptive thresholding algorithm to get the final segmentation of curve patterns. Figure 6 shows the sample results after each step of this algorithm. We also extract the boundary of a sherd, indicated by red contours in Figure 6. The sherd boundary provides a mask to exclude all the information outside the sherd boundary from matching in the later steps. This CNN-based algorithm can segment the curve

pattern from a sherd much more accurately than other low-level and high-level image segmentation algorithms.

However, most of the sherds contain non-composite patterns, i.e. only one copy of partial designs is present on these sherds. The second step of our framework is thus to identify underlying designs for sherds with non-composite patterns. The segmented curves from the above step can be far from perfect because of the strong noise and shallow stampings on the unearthed sherds. In particular, the curve pattern segmented from a sherd may show deformation from its underlying design due to dehydration and shrinkage during the firing process when finishing the vessel. In this step, we elaborate on a two-stage matching algorithm that is robust to noise, errors and deformation present in the segmented curve patterns. We formulate this problem by matching the curve pattern segmented from a sherd against each location, with each possible orientation, of each known design, and then select the design with the lowest matching cost as the matched design. This exhaustive matching procedure identifies not only the matched design, but also the matched location and orientation on the matched design. Based on this problem formulation, the key issue is then the definition of an appropriate cost in matching the curve patterns segmented from a sherd to a location of a full design, with a specified orientation.

This problem is nontrivial in archaeological applications for two reasons. First, the exhaustive matching against each possible location and orientation of each design leads to a very large search space. To prevent the algorithm from slowing down too much, we require the matching cost to be very efficient to compute for each possible solution in the search space. Second, compared with the underlying design, the curve patterns segmented from the sherd usually contain strong noise and deformations from the firing process, degradation from many years spent under the earth, and the imperfectness of the curve-segmentation algorithms.

To address this problem, we developed a new two-stage matching algorithm, with a different matching cost in each stage, as shown in Figure 7. In Stage 1, we propose to use a computationally-efficient classical template matching method over the whole search space to identify a small set of candidate matchings on all the known designs. The extracted sherd mask is applied as a region of interest in matching to exclude information outside this region. This simple matching cost can help efficiently reduce the search space of solutions. In Stage 2, we further derive a new matching cost by training a dual-source Convolutional Neural Network. We then apply this more computationally-intensive matching to re-rank the candidate matchings identified in Stage 1. This CNN architecture is shown in Figure 8(a).

The CNN architecture contains two identical sub-networks, which take candidate matchings and sherd curve patterns as the inputs, respectively. Each sub-network consists of a sequence of convolution, max pooling layers and a global average pooling layer (GAP) for feature learning. We implement this dual source CNN by truncating AlexNet, a CNN developed by Krizhevsky, as shown in Figure. 8(b), to "conv4" layer and replacing all layers after "conv4" layer with a GAP layer. A new matching cost is then derived by comparing the similarities between the features learned after the GAP layers. Through this supervised learning, various

kinds of noise and deformations in the segmented curve patterns can be implicitly identified and suppressed in computing the CNN-based matching cost.

In the making of the pottery, the carved paddle is stamped on the pottery multiple times to ensure full coverage of the surface. As a result, a large number of the pottery sherds contain composite patterns, i.e. each pattern is a part of its underlying design, and these patterns can overlap with each other. Classical matching methods, such as Chamfer matching, require one pattern to be a portion of the other. This is not true in this case, as the curve pattern on the sherd is a composite one. As explored in previously-presented work, Snowvision team members dealt with this issue by developing a new algorithm that can automatically identify multiple components of the composite pattern extracted from the sherd (Zhou, et al.).

Taking sherd curve pattern images and design images, we first use a standard edge-thinning algorithm to reduce the curve width to one pixel as illustrated in Figure 9 (b). Although the width of curves presents an important clue in matching a sherd and a design, we try not to use the curve width information because of the difficulty of accurately measuring the curve width from a deteriorated sherd surface. Second, we extended the classical Chamfer matching method to match the one-pixel-wide curve patterns from a sherd against each location, with each possible orientation, of each known design. Different from the classical Chamfer matching algorithm, we do not pick the design with the lowest matching cost. Instead, for each design, we select several matchings as candidates, so long as each candidate fulfills a threshold percentage of total pixel matches. Shown in Figure 10, these candidates are then combined and reconstructed. The combination with the most matching pixels (which we interpret as a marker completeness) and least overlapping pixels is taken as the best matching, and its normalized completeness is taken as its matching score. The design with the highest matching score is selected as the sherd's underlying design.

To evaluate our framework, we collected a set of 1,000 Swift Creek pottery sherds that were excavated from various archaeological sites located in southeastern North America. Of these sherds, 900 contain non-composite patterns that represent 98 unique paddle designs, and the remaining 100 contain composite patterns representing 20 unique paddle designs. Each sherd in the set only displays one design, while that same design may be applied to the surfaces of multiple sherds. We use the CMC ranking metric developed by DeCann and Ross to evaluate the matching performance, as shown in Figure 11 (DeCann and Ross). In CMC curves, the higher the better. The experiments show our framework performs much better than several state-of-art algorithms.

Findings and Accomplishments

Through both our building upon and expanding multiple state-of-the-art algorithmic pattern-matching techniques *and* the creation of World Engraved, the Snowvision project has already made several significant contributions to southeastern archaeology. Nevertheless, much remains to be learned about

the cultures who produced this pottery, and we believe that Snowvision will help shape the development of future scholarship in this area. Archaeological fieldwork is ongoing, which means that new data is being collected. Our algorithm greatly reduces the time spent identifying matches, and design-to-sherd scaling issues encountered during algorithm development have shown that a fraction of reconstructed paddle designs are actually design variants reproduced on two paddles with slight differences. Interdisciplinary collaboration has made the matching algorithm possible and is being carried into other aspects of the project.

We have made fruitful use of methods and ideas from information science in building both our database and World Engraved. Metadata schemas are being developed to assist researchers in submitting rich and accurate datasets, and a user needs study is being conducted to gather feedback and opinions on the algorithm, database, and website. While these tools are well-established within information science practice and literature, they are underutilized within archaeological digitization projects. Information professionals have created, refined, and freely published dozens of metadata schemas, such as Dublin Core or VRA Core, to promote resource discovery, access, and sharing (Park & Tosaka). Instructional templates that function as schemas are created for submission of archaeological data to specialized laboratories, such as those created by the Archaeometry Laboratory at the University of Missouri Research Reactor. Our schemas go beyond these instructional templates to incorporate additional fields from published schemas, such as rights statements and date of creation, that are relevant for digital publication. User assessments are commonplace within information science to ensure digital collections are relevant to users and to incorporate their needs into new or existing information systems (Mills; Green and Courtney; Wu, et al.). Preliminary data shows that the primary use of Snowvision will be to further research on the connections and movements of populations and that it will provide an avenue for student training and collaborative research. Our experiences have also indicated that researchers need access to robust data, that we need to expand to other types of complicated ceramics outside of the Swift Creek type, and that mechanisms need to be created in order to ensure that data is properly attributed to the source.

This information-focused work is being done to ensure that the Snowvision database adequately contributes to comparative research, broad syntheses, and publication of standardized archaeological data. Large-scale synthesis is needed to bring our understanding of the past from the site level to the regional level, and American archaeologists must make a return on public investment by sharing and preserving the knowledge they gain for future generations (Altschul et al., 2018). Snowvision has accomplished goals relating to synthesis, public access, and preservation. Snowvision's complementary public digital repository, World Engraved, allows for user-driven submission of data, enabling laboratories across southeastern North America to share standardized datasets for synthesis and publication in a digital archive. This will allow users to access the data held at many scattered institutions. There is no cost for any of the online Snowvision or World Engraved services, greatly expanding the accessibility of this archaeological

data from a handful of researchers to any person with an internet connection. All of the original designs drawn by Broyles were lost after her death, and the digital copies held unpublished by the University of Georgia were the only records that remained. Snowvision has preserved her designs for future use and provided public access through World Engraved.

A final word should perhaps be said about public dissemination. In a way that may be unexpected to casual readers, careful consideration must be given to how sensitive data is released. Digitization of legally restricted site information has been accomplished using the example set by DINAA, but this is only one kind of sensitive data. While Swift Creek pottery is commonly found as fragmented utilitarian cooking vessels from middens and village sites, the designs were also imprinted on vessels that have been found in mound burial contexts. The excavation, study, and display of burial objects was frequently undertaken without descendant community consent for hundreds of years prior to the US Congress's passage of the Native American Graves and Repatriation Act in 1990. This has placed archaeological artifacts into a discussion of who owns the past based on cultural and intellectual property claims, created a formalized system of repatriation for human remains and funerary objects, and opened new avenues for collaborative research (Breske). While discussion of who owns the past continues, the benefits and challenges of digitization remain largely absent from the discourse. Snowvision is working with established researchers connected to descendent communities to accommodate the inclusion of sherds and designs from burial context. We believe through consideration, respect, and conversation, Snowvision can provide access to this data in ways that benefit researchers and the public and contribute to a more equitable digital archaeological future. The result, we hope, will be a fuller—and more respectful—picture of the complex social, cultural, and economic practices and networks of ancient southeastern North America than has been previously possible.

Works Cited

Altschul, Jeffrey H., et al. "Fostering Collaborative Synthetic Research in Archaeology." *Advances in Archaeological Practice*, vol. 6, no. 1, 2018, pp. 19-29. doi: 10.1017/aap.2017.31.

Anderson, David G. "Swift Creek in a Regional Perspective." *World Engraved: Archaeology of the Swift Creek Culture*, edited by Mark Williams & Daniel T. Elliott, University of Alabama Press, 1998, pp. 274-300.

Barrow, Harry, et al. "Parametric Correspondence and Chamfermatching: Two New Techniques for Image matching." International Joint Conference on Artificial Intelligence, 1977. Conference Presentation.

Brand, Amy, et al. "Beyond Authorship: Attribution, Contribution, Collaboration, and Credit." *Learned Publishing*, vol. 28, 2015, pp. 151–155. doi:10.1087/20150211.

Breske, Ashleigh. "Politics of Repatriation: Formalizing Indigenous Repatriation Policy." *International Journal of Cultural Property*, vol. 25, 2018, pp. 347-373. doi:10.1017/S0940739118000206.

Broyles, Bettye J. "Reconstructed Designs from Swift Creek Complicated Stamped Sherds." *Southeastern Archaeological Conference Bulletin*, vol. 8, 1968, pp. 49-74.

Chase, David W. "Swift Creek: Lineage and Diffusion." *World Engraved: Archaeology of the Swift Creek Culture*, edited by Mark Williams and Daniel T. Elliott, University of Alabama Press, 1998, pp. 48-60.

DeCann, Brian and Arun Ross. "Relating ROC and CMC Curves via the Biometric Menagerie." IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems, 2013. Conference Presentation.

Elliott, Daniel T. "The Northern and Eastern Expression of Swift Creek Culture: Settlement in the Tennessee and Savannah River Valleys." *World Engraved: Archaeology of the Swift Creek Culture*, edited by Mark Williams & Daniel T. Elliott, University of Alabama Press, 1998, pp. 19-35.

Green, Harriett E., and Angela Courtney. "Beyond the Scanned Image: A Needs Assessment of Scholarly Users of Digital Collections." *College & Research Libraries*, vol. 76, no. 5, 2015, pp. 690-707. doi:10.5860/crl76.5.690.

Halíř, Radim. "An Automatic Estimation of the Axis of Rotation of Fragments of Archaeological Pottery: A Multi-Step Model-Based Approach." International Conference in Central Europe on Computer Graphics, Visualization and Interactive Digital Media, 1999. Conference Presentation.

Holmes, W.H. "Caribbean Influence in the Prehistoric Art of Southern States." *American Anthropologist,* vol. 7, 1894, pp. 71–79.

Kampbel, Martin and Robert Sablatnig. "Rule Based System for Archaeological Pattern Recognition." *Pattern Recognition Letters*, vol. 28, no. 6, 2007, pp. 740-747.

Krizhevsky, Alex, Ilya Sutskever, and Geoffrey E. Hinton. "Imagenet Classification with Deep Convolutional Neural Networks." Advances in Neural Information Processing Systems, 2012. Conference Presentation.

Long, Jonathan, Evan Shelhamer, and Trevor Darrell. "Fully Convolutional Networks for Semantic Segmentation." Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2015. Conference Presentation.

Mills, Alexandra. "User Impact on Selection, Digitization, and the Development of Digital Special Collections." *New Review of Academic Librarianship*, vol. 21, 2015, pp. 160-169. doi:10.1080/13614533.2015.1042117.

Park, Jung-ran., and Yuji Tosaka. "Metadata Creation Practices in Digital Repositories and Collections: Schemata, Selection Criteria, and Interoperability." *Information Technology & Libraries*, vol. 29, no. 3, 2010, pp. 104-116. doi: 10.6017.ital.v29i3.3136.

Pluckhahn, Thomas J. "Reflections on Paddle Stamped Pottery: Symmetry Analysis of Swift Creek Paddle Designs." *Southeastern Archaeology*, vol. 26, no. 1, 2017, pp. 1-11.

Sassaman, Kenneth E. "Woodland Ceramic Beginnings." *The Woodland Southeast*, edited by David G. Anderson and Robert C. Mainfort, Jr., University of Alabama Press, 2002, pp. 398-420.

Saunders, Rebecca. *Attribute Variability in Late Swift Creek Phase Ceramics from Kings Bay, Georgia*. University of Florida, Master's Thesis. 1986.

Smith, Betty A. "Neutron Activation Analysis of Ceramics from Mandeville and Swift Creek." *World Engraved: Archaeology of the Swift Creek Culture*, edited by Mark Williams and Daniel T. Elliott, University of Alabama Press, 1998, pp. 112-129.

Smith, Karen Y., and Vernon James Knigth, Jr. "Style in Swift Creek Paddle Art." *Southeastern Archaeology*, vol. 31, no. 2, 2012, pp. 143-156. doi:10.1179/sea.2012.31.2.002.

Smith, Karen Y., and Vernon James Knigth, Jr. "Swift Creek Paddle Designs and the Imperative to be Unique." *Southeastern Archaeology*, vol. 36, no. 2, 2017, pp. 122-130. doi:10.1080/0734578X.1246342.

Snow, Frankie. "An Archaeological Survey of the Ocmulgee Big Bend Region." *Occasional Papers from South Georgia*, Number 3. Douglas, GA: South Georgia College, 1977.

___ . "Swift Creek Design Investigations: The Hartford Case." *World Engraved: Archaeology of the Swift Creek Culture*, edited by M. Williams and D.T. Elliott, University of Alabama Press, 1998, pp.61-98.

___ . "Swift Creek Designs and Distributions: A South Georgia Study." *Early Georgia* vol. 3, 1975, pp. 38–59.

___ . "Kolomoki and Milamo–Some Synchronic Evidence." *The Profile* vol. 36, 1982, pp. 7–12.

Snow, Frankie, and Keith Stephenson. "Swift Creek Designs: A Tool for Monitoring Interaction." *World Engraved: Archaeology of the Swift Creek Culture*, edited by Mark Williams and Daniel T. Elliott, University of Alabama Press, 1998, pp. 99-111.

Stephenson, Keith, Frankie Snow, and Karen Y. Smith. "Design Connections in Early and Late Swift Creek." Southeastern Archaeological Conference 69th Annual Meeting, Baton Rouge, LA., 2012. Conference Presentation. doi:10.13140/RG.2.2.12839.78242.

Wallis, Neill J. *The Swift Creek Gift: Vessel Exchange on the Atlantic Coast*. The University of Alabama Press, 2011.

Wallis, Neill J., and Amanda O'Dell. "Swift Creek Paddle Designs from the Florida Gulf Coast: Patterns and Prospects." *The Florida Anthropologist*, vol. 64, 2011, pp. 187–205.

Williams, Mark & Daniel T. Elliott. "Swift Creek Research: History and Observations." *World Engraved: Archaeology of the Swift Creek Culture*, edited by Mark Williams and Daniel T. Elliott, University of Alabama Press, 1998, pp. 1-11.

Wu, Annie, et al. "Hitting the Road Towards Greater Digital Destination: Evaluation and testing DAMS at University of Houston Libraries." *Information Technology & Libraries*, vol. 35, no. 2, 2016, pp. 5-18. doi:10.617/ital.v35i29152.

Yuhang Lu, et al. "Curve-Structure Segmentation from Depth Maps: A CNN-

Based Approach and its Application to Exploring Cultural Heritage Objects." AAAI Conference on Artificial Intelligence, 2018. Conference Presentation.

Zhou, Jun, et al. "Identifying Designs from Incomplete, Fragmented Cultural Heritage Objects by Curve-Pattern Matching." *Journal of Electronic Imaging*, vol. 26, no. 1, 2017, pp. 11-22. doi:10.1117/1.JEI.26.1.011022.

Appendix: Figures

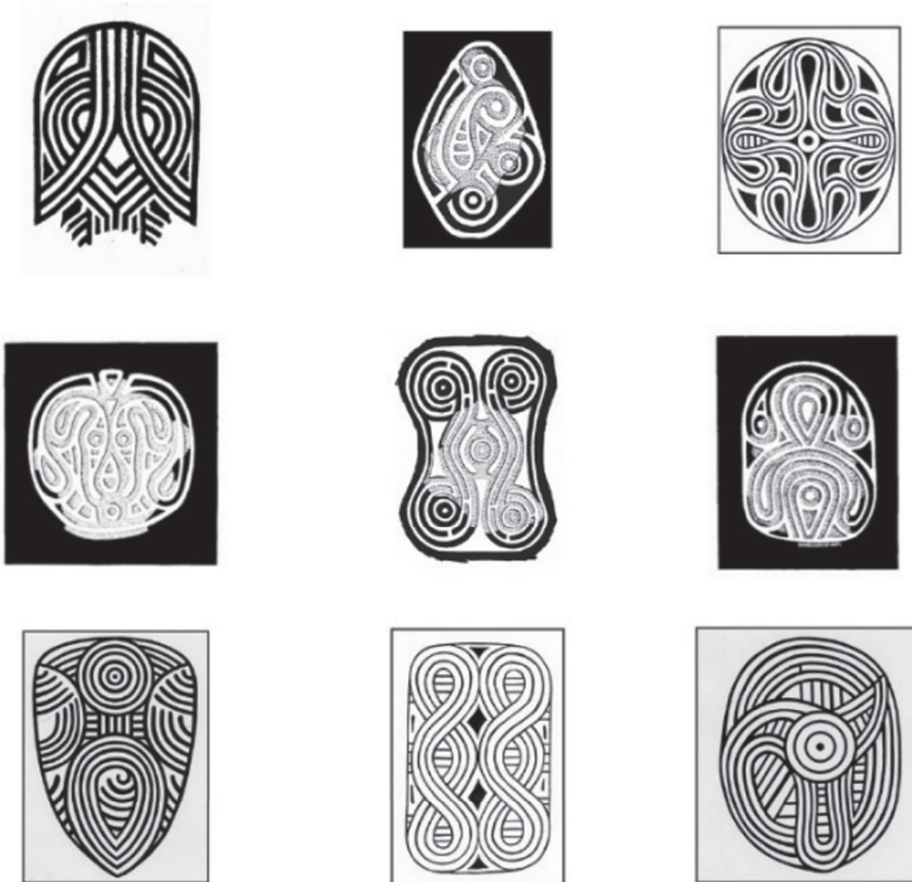

Figure 1. Paddle design reconstructions by Broyles (Row 1, design #2, BBFCL334; Row 2, all, BBP14-5, BBME26_4-1, BBP17-1), Snow (Row 1, design #3, FS007; Row 3, all, FS338, FS068, FS000), and an unknown llustrator (Row 1, design #1).

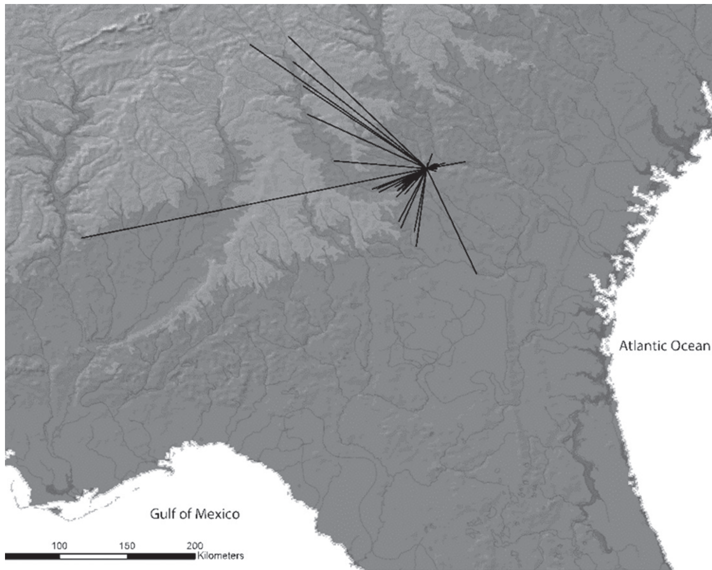

Figure 2. Design matches between Milamo (9WL1) and other sites in the region. Black lines represent one or more paddle design matches. Most matches with Milamo occur within the Ocmulgee-Big Bend (Stephenson, et al.).

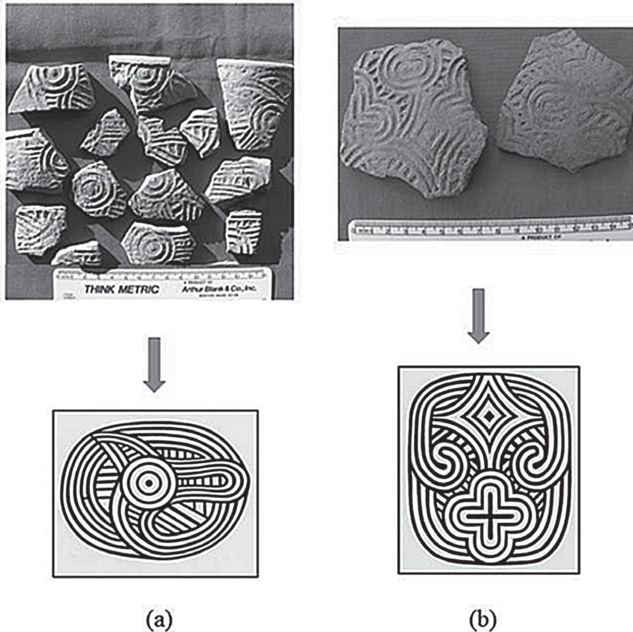

Figure 3. Sample pottery sherds (top) and their underlying wooden paddle designs (bottom). Two pottery sherds in (b) contain a composite pattern, resulting from the multiple applications of the carved paddle with partial spatial overlaps. Original designs reproduced with permission, courtesy of Frankie Snow, South Georgia State College.

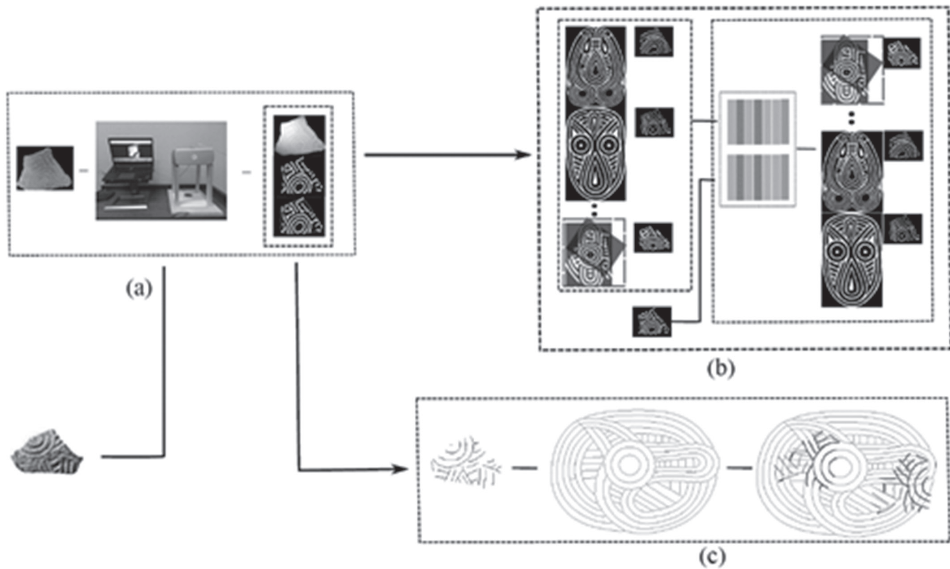

Figure 4. An illustration of a framework on identifying the underlying design for a sherd. (a) Extract a curve pattern from a sherd. (b) Identify the underlying design for a sherd with a non-composite pattern. (c) Identify the underlying design for a sherd with a composite pattern. Original design reproduced with permission, courtesy of Frankie Snow, South Georgia State College. Chamfer Matching algorithm (Barrow).

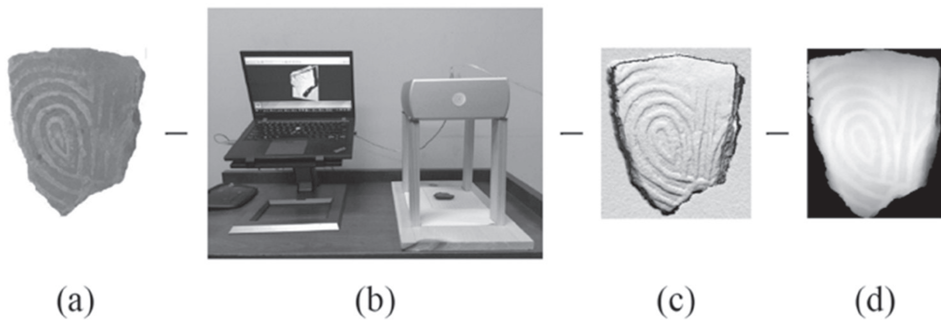

Figure 5: An illustration of scanning sherds for depth images. (a) RGB image of a sherd. (b) Setup of a 3D scanner. (c) 3D point cloud of the sherd surface obtained by the 3D scanner. (d) Depth image of the sherd surface: pixel intensity represents the depth value at a location.

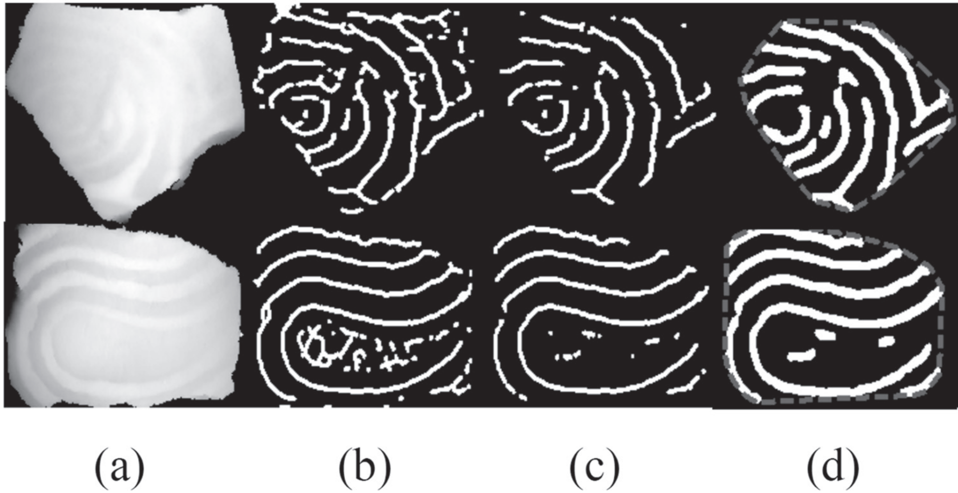

Figure 6. An illustration of segmenting curve patterns from sample sherds. (a) Depth images of sherds, where darker pixels have larger depths. (b) FCN-extracted curve skeletons. (c) Refined curve skeletons by using a dense prediction CNN. (d) Final segmented curve patterns with recovered curve width, masked by the sherd boundaries.

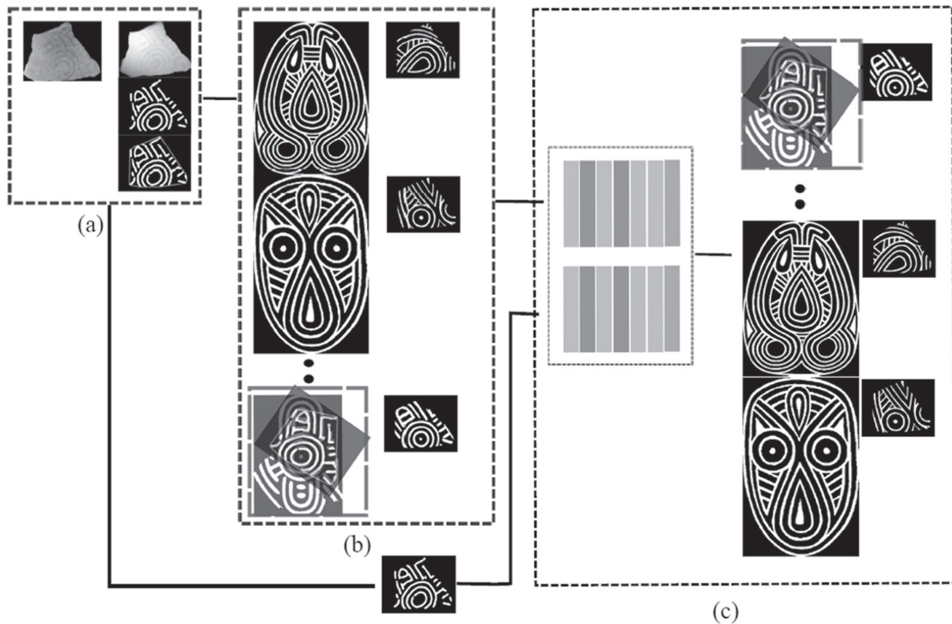

Figure 7. An illustration of the full pipeline of identifying design for a sherd with non-composite patterns. (a) Curve pattern segmentation from a sherd. (b) Stage 1: template matching with all the designs for selecting a small set of candidate matchings of the input sherd. (c) Stage 2: CNN-based re-ranking of the candidate matchings. Correctly matching design is shown in box, which is ranked low in Stage 1 but ranked at the top in Stage 2. Original design reproduced with permission, courtesy of Frankie Snow, South Georgia State College.

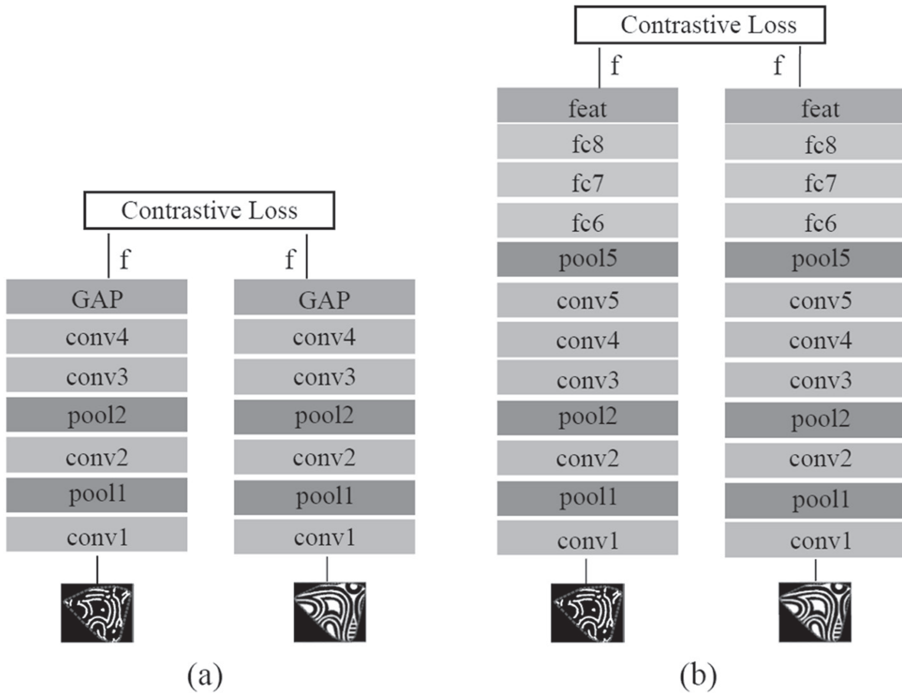

Figure 8. An illustration of the dual-source CNN architectures: (a) the proposed CNN and (b) AlexNet.

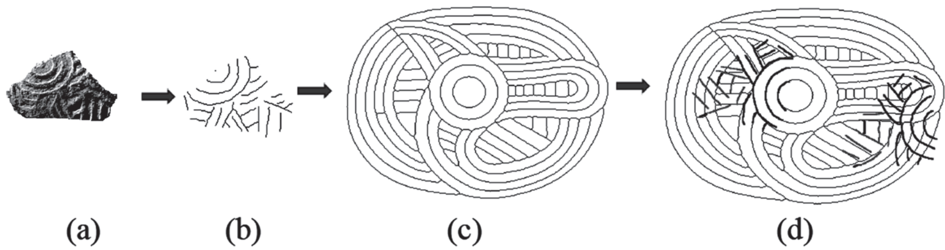

Figure 9. An illustration of identifying the underlying design for a sherd with a composite pattern. (a) A sherd image. (b) Curve extraction from a sherd. (c) Curve extraction from a design. (d) A sherd matching to two locations on a design. Original design reproduced with permission, courtesy of Frankie Snow, South Georgia State College.

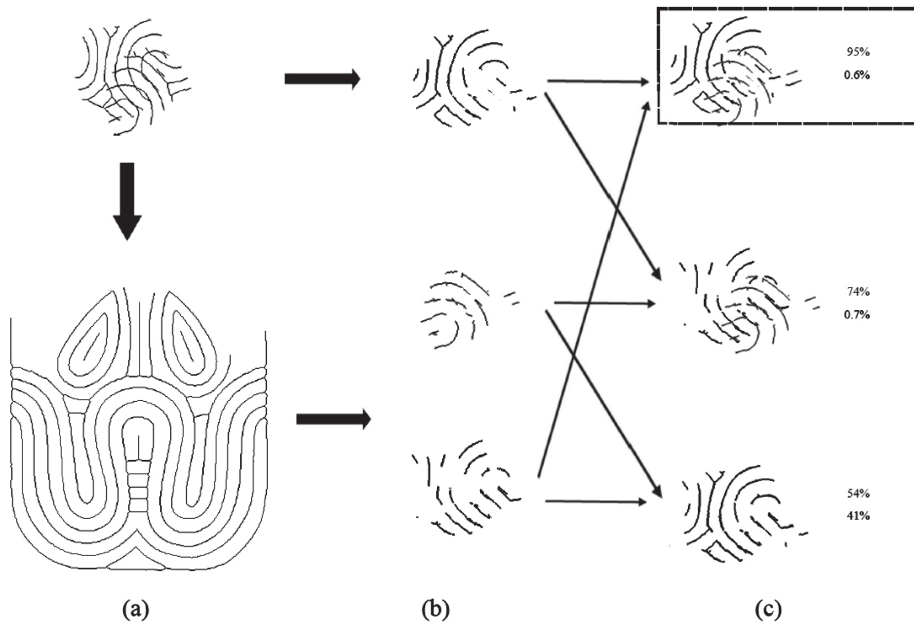

Figure 10. The process of combining candidate components for matching to a design. The optimal result is indicated in the box. (a) Matching a sherd pattern (top) to a design pattern (bottom). (b) Candidate Components. (c) Combining candidate components (best matching is shown in box). Original design reproduced with permission, courtesy of Frankie Snow, South Georgia State College.

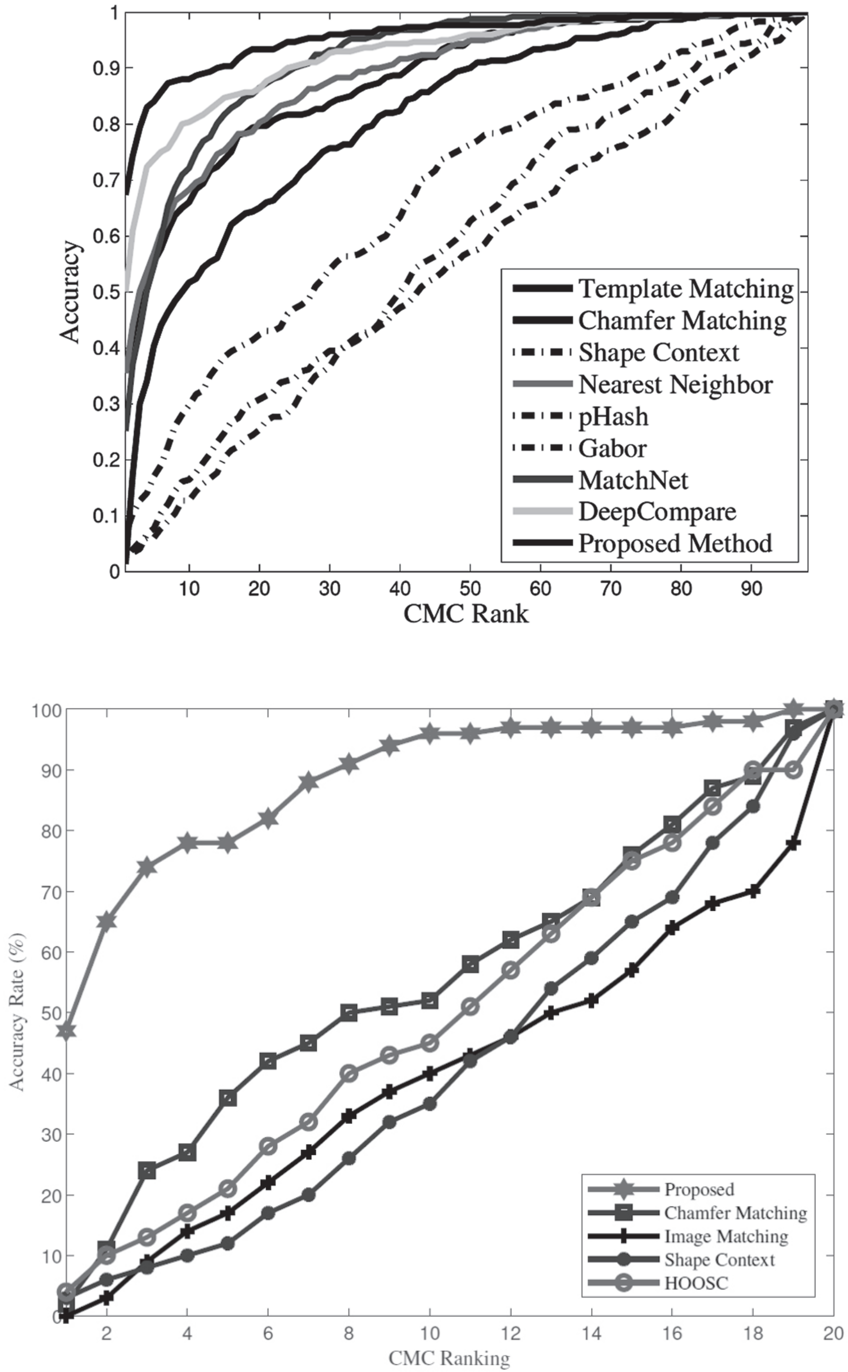

Figure 11. CMC curves of the proposed method and the comparison methods. Up: results on non-composite sherds. Down: results on composite sherds.

Robert L. Boss

Visualizing Jonathan Edwards

Abstract: This article begins by introducing Jonathan Edwards, the eighteenth century American philosopher theologian from Northampton, Massachusetts. Edwards believed that the world of nature had communicative properties, full of types and symbols, and indeed, was a kind of language of God. This article posits that Edwards' typological language of nature, encapsulated in his notebook "Images of Divine Things" and throughout his written corpus, can be explored through the lense of Digital Humanities and network analysis using Processing and Python programming languages. Next, the article summarizes recent Edwards-focused DH projects by Kenneth Minkema, Michał Choiński, and Michael Keller. The article then recounts the history and development of the *Visual Edwards* project and how it expands exploration of the 26 volume Yale letterpress edition of *The Works of Jonathan Edwards.* Features of the *Visual Edwards* software are introduced briefly, as well as print publications flowing from the project.

Keywords: Jonathan Edwards, typology, nature, theology, network analysis, Processing programming language, Python programming language, Digital Humanities, Visual Edwards software, Visual Edwards Library

Jonathan Edwards (1703–1758) was a colonial Congregational minister and theologian in Northampton, Massachusetts who is most famous for his leadership in the religious revivals of Colonial America commonly known as the First Great Awakening. Though he is mainly remembered for sermons such as "Sinners in the Hands of an Angry God," Edwards produced a mountainous range of theological discourses, miscellanies, and treatises on topics such as religious experience, free will, redemption history, ethics, and original sin. Along with his writings on theological themes, Edwards fully engaged the Enlightenment and the challenges of deism. One of Edwards's most fascinating productions from this engagement is his notebook of types and emblems, "Images of Divine Things" (Edwards et al. 1993, 48–142).

Edwards, the eighteenth century American philosopher theologian, believed that God created the world for human reflection and contemplation, "to instruct intelligent beings in things pertaining to himself." ("Images," no. 57) In a sermon on Matthew 13:23, "Profitable Hearers of the Word," Edwards notes that the reason Scripture often teaches through allegories, parables, and types is

> that we might have some exercise for our understandings to find out the truth contained in them. Our understandings were given us to be used, and above all to be exercised, in divine things. Therefore God teaches us in such a way that we shall have some exercise of meditation and study. God gives us the gold, but he gives it to us in a mine that we might dig for it and get in a way of our own industry…and that makes it precious…This is not only God's method in Scripture, but his method in nature also. The works of God are hard to be understood, that they might be "sought out of all them that have pleasure in them" (Psalms 111:2) (Edwards and Kenneth P. Minkema 246–47).

Edwards and many others have observed that Christ connects spiritual truths to things commonly seen and experienced in nature and everyday life—He infuses a divine luminescence into ordinary things and activities. In the spiritual autobiography *Surprised by Joy,* C.S. Lewis described his own spiritual awakening in a similar way—as a bright shadow "transforming all common things and yet itself unchanged. Or, more accurately, I saw the common things drawn into the bright shadow" (Lewis 100). Lewis described the experience as a baptism of his imagination. A spiritual baptism of the imagination that awakens the heart to "shadows of divine things" is exactly what Jonathan Edwards offers twenty-first century believers.

Edwards believes that it should come as no surprise that God takes delight in using the created order to teach humans spiritual things, "representing divine things by his works" ("Images," no. 57). God has made the world in such a way that it rhymes with Scripture. This truth was widely accepted in Puritan spirituality (Hambrick-Stowe 163–64). This essay briefly proposes the continued relevance of exploring Edwards' emblematic world that rhymes with Scripture and how a researcher might approach this challenge from a Digital Humanities perspective.

Edwards the Creative

Edwards was a theologian who was aware of his own singularity and creative vision:

> I expect by very ridicule and contempt to be called a man of a very fruitful brain and copious fancy, but they are welcome to it. I am not ashamed to own that I believe that the whole universe, heaven and earth, air and seas, and the divine constitution and history of the holy Scriptures, be full of images of divine things, as full as a language is of words; and that the multitude of those things that I have mentioned are but a very small part of what is really intended to be signified and typified by these things: but that there is room for persons to be learning more and more of this language and seeing more of that which is declared in it to the end of the world without discovering all (Edwards, et al. 152).

Edwards' reading reveals extensive interdisciplinary interests and pursuits (Edwards and Thuesen 17). Under the heading "Books to be enquired for," he lists several broad subject areas (nos. 229–39), including "the best Geography," "the best history of the world," "the best exposition of the Apoca[lypse]" (the book of Revelation), "[those] Which are the most usefull & necessary of the Fathers," "the best Chronology," "the best historical Dictionary of the Nature of Bayle's Dictionary," "the best that treats of the Cabbalistical learning of the Jews," (Edwards and Thuesen 17) as well as interests in science and mathematics (Edwards and Thuesen 93-96). The final entry in the "Catalogue" included a treatise on geometry by a French Jesuit — "For Edwards, every mathematical theorem or scientific discovery revealed God' providential design" (Edwards and Thuesen 94). Were he in the 21st century, Edwards could be categorized as an interdisciplinary creative—a creative Evangelical theologian.

Eighteenth century Edwards' "best of" list was quite ambitious. But what would a 21st century Edwards add to his "best of" list in a digital world? Best software, computer languages, PC or Mac, iOS or Android, etc.? Not one to retreat, Edwards the

interdisciplinarian would almost certainly embrace the Digital Humanities. Broadly speaking, Digital Humanities is an academic field concerned with the application of computational tools and methods to traditional humanities disciplines such as literature, history, and philosophy. Many of these tools enable management and analysis of large textual projects, such as his "Miscellanies" and other notebooks.

A World of Connections

The strategies and goals of Edwards, especially in his world view and creational theology, align with the strategies and goals of Digital Humanities: the discovery of context, connection, harmony, symmetry, communication, and networks of meaning. In his notebook "Images of Divine Things," entry nos. 8 and 59 reveal Edwards clearly describing a network of correspondences in the system of the created order.

> Again, it is apparent and allowed that there is a great and remarkable analogy in God's works. There is a wonderful resemblance in the effects which God produces, and consentaneity in his manner of working in one thing and another, throughout all nature. It is very observable in the visible world. Therefore 'tis allowed that God does purposely make and order one thing to be in an agreeableness and harmony with another. And if so, why should not we suppose that he makes the inferior in imitation of the superior, the material of the spiritual, on purpose to have a resemblance and shadow of them? We see that even in the material world God makes one part of it strangely to agree with another; and why is it not reasonable to suppose he makes the whole as a shadow of the spiritual world ("Images," no.8)

> If there be such an admirable analogy observed by the Creator in his works throughout the whole system of the natural world, so that one thing seems to be made in imitation of another, and especially the less perfect to be made in imitation of the more perfect, so that the less perfect is as it were a figure or image of the more perfect— so beasts are made in imitation of men, plants are [a] kind of types of animals, minerals are in many things in imitation of plants why is it not rational to suppose that the corporeal and visible world should be designedly made and constituted in analogy to the more spiritual, noble and real world? 'Tis certainly agreeable to what is apparently the method of God's working ("Images," no. 59).

Entries like these, combined with his intricate indexes and tables, reveal that Edwards was working on a solution to a very large network problem. Jonathan Edwards, were he a 21st century creative, would tackle such a problem with the very best tools available—programmatic solutions for complex network analysis—tools that would allow one to recognize, construct, visualize, analyze, and interpret. Edwards, with his perception of the language of God in creation, would be drawn to computer languages like Python and Processing to work through the symbolic network and visualize semiotic structures in a compelling way. It is quite easy to imagine a present/future Edwards doing this type of work (Eco 217–18).[1]

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1 Eco notes that Descartes contemplated the possibility of solving linguistic problems in an algebraic fashion. This mathematical approach is similar to a programmatic solution to 21st century

Edwards' Curious Little Book

Edwards kept a notebook…"Images of Divine Things." Though "Images of Divine Things" is what Edwards finally decided to name the notebook, he had considered other titles-—"Shadows of Divine Things," "The Book of Nature and Providences," and "The Language and Lessons of Nature." (Edwards et al. 34–35) "Images" was a long term project of Edwards, beginning early in his pastorate at Northampton around September or October of 1728 and ending shortly before he assumed the presidency of Princeton in 1758 (Edwards et al. 39, 46).

"Images of Divine Things" contains 212 entries followed by another series of 45 brief entries entitled "Scriptures" which list particular creatures and what they represent. Each of the 45 entries are accompanied by a reference to the scriptural foundation for the association. Following the "Scriptures" series is a "Subject Index" of the creatures featured in "Images" which, in turn, is followed by a "Scripture Index" of the Scripture passages cited in the notebook.

At first appearance, "Images of Divine Things" seems to be a quaint collection—212 entries of things that Edwards observes in both nature and common experience which he thinks might enliven and enforce his sermon points. Yet a closer reading of his writings reveals his true design: a systematic study which has as its central thesis that all of visible creation is designed by God to "represent spiritual things." (Edwards and Thomas A. Schafer 434)

In "Images," Edwards manifests his recognition of a deep relationship between nature and Scripture. The tables and indexes of both Scriptures and subjects which he appends to the notebook reveal his systematic thought. This small notebook is a portal to a world of theological complexity which cannot be charted or mapped with simple tree diagrams and one-to-one correspondences. The complex connections between doctrine, Scripture, nature, and each entry cannot be captured on pen and paper. It is simply too much data. Hence the need for a new approach, not only a complex network solution to Edwards' "Images," but to his broader work as well.

Extracting scriptural doctrine from nature, as Edwards desired to do, is no small feat. A helpful strategy for examining the theological content of his notebook "Images of Divine Things" is to reorganize and summarize Edwards' 212 entries according to theological categories—Revelation, God the Creator and Father, God the Son, God the Holy Spirit, Humanity, Church, and Last Things, along with respective subcategories. This arrangement of Edwards' "Images" according to creational categories and theological themes places his key doctrinal points and doctrinal precision in the clearest light (Edwards and Wilson H. Kimnach 45).[2] Rearranging Edwards notebook is an artful endeavor that, fortunately, does not compromise its integrity and remains in tune with Edwards' creative precision.

A Visual Approach

The entire Edwardsean corpus, not only his "Images" notebook, brims with creative genius. The quality of his thought calls for an approach that attempts to answer his

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Edwards would have used to tackle the complex network problem in his "Images" notebook.

2 Wilson Kimnach notes the doctrinal precision of Edwards' "Images".

genius as a creative Evangelical theologian. This approach would extend beyond his emblematic world view to the whole printed corpus. A universe of complexity and wonder exists in the visualized interrelations of his miscellanies, sermons, treatises, various notebooks, and letters.

A rationale for a visual approach to Edwards might be helped by a brief history of typography. Edwards' works were initially printed with press technology not far removed from Gutenberg's of the fifteenth century, which used individual letters cast from lead. Developments in the nineteenth century witnessed the advent of automated typesetting machines. The latter twentieth century gave rise to personal computers and the Internet which began to displace paper with screens and hypertext. Following this digital revolution, digital fonts were born. Type was no longer produced through physical means. Instead, mathematical descriptions defined each character's outline. Today is a day of typographic experimentation—digital typefaces are sophisticated software and old physical limitations no longer apply. Fonts can now contain advanced algorithms which automatically change size and shape depending on their context and even respond to the rhythm and tempo in which they are typed (Reas and Fry 149).

The advances which precipitated the revolution in typography are now occurring, in a similar way, in our ability to read and understand large bodies of text. The digital age enabled the creation of fonts with unlimited scalability and flexibility. The unlimited computational attributes of a small individual letter or point of punctuation also extends to a large corpus…including the writings of Edwards. A *Visual Edwards* project grants a new view of America's theologian. *Visual Edwards* is, as it were, an advanced computational material which can be stretched, bent, and zoomed to direct the scholar to areas of interest. As a cartographic tool, it grants the reader a new visual access to Edwards in his own words. The computer is both an artistic tool and canvas. If it can be imagined, it can be created. It is a medium uniquely suited to visually explore the thought of Jonathan Edwards '.

Why Visualize Edwards?

There are a number of benefits to visualizing Edwards. First, visualizations can reduce the cognitive load of the researcher—a greater amount of information can be communicated in a detailed graph more quickly than having to scan through thousands of lines of Edwards' text. Yet, at the same time, the visual maps direct the user to read Edwards. These maps reveal the presence of unseen seismic structures in Edwards' writings and direct the user where to, as it were, "drill for oil" or "mine for gold." This is especially helpful for new students of Edwards who desire direct contact with his writings.

Second, visualizations of Edwards' writings are beautiful confluences of theology, technology, and art. The colors and connections guide the eye, and in a blink the reader can assess the content. This can be described as "Edwards at a glance." New contexts and details are revealed in visualizations which are both aesthetic and accurate.

Visualizing Edwards is not entirely new. Wilson Kimnach's conceptual diagram in volume 10 of *The Works of Jonathan Edwards* illustrates the intertextuality of Edwards' notebooks and sermons, reflecting the formidable intellectual and spiritual effort Edwards famously exerted in his study for up to 13 hours a day (Edwards and

Wilson H. Kimnach 90). The complex and aesthetically profound nature of Edwards' writings beg for a visual exegesis that is exhaustive, vibrant, and tactile. The interrelated character of Edwards' thought births a desire to visualize the beautiful complexity within his writings.

The marriage of Edwards studies and Digital Humanities can be credited largely to the Jonathan Edwards Center at Yale University. Under the direction of Kenneth P. Minkema, *The Works of Jonathan Edwards Online* was created. Though the Yale letterpress series of Edwards' works numbers an impressive 26 volumes, *The Works of Jonathan Edwards Online* adds another 47 volumes of primary texts comprised of sermons, notebooks, essays, letters, and more. "*The Works of Jonathan Edwards Online* is a digital learning environment for research, education, and publication that presents all of Edwards's writings in a critical edition, along with helpful editorial materials to allow the reader to examine Edwards's thoughts in incredibly powerful, useful ways."[3] *The Works of Jonathan Edwards Online* has been hailed as an unrivaled digital resource and singular monument to America's Theologian. The digital research environment provides the possibility of researching Edwards in new ways and inspires experimentation with new tools.

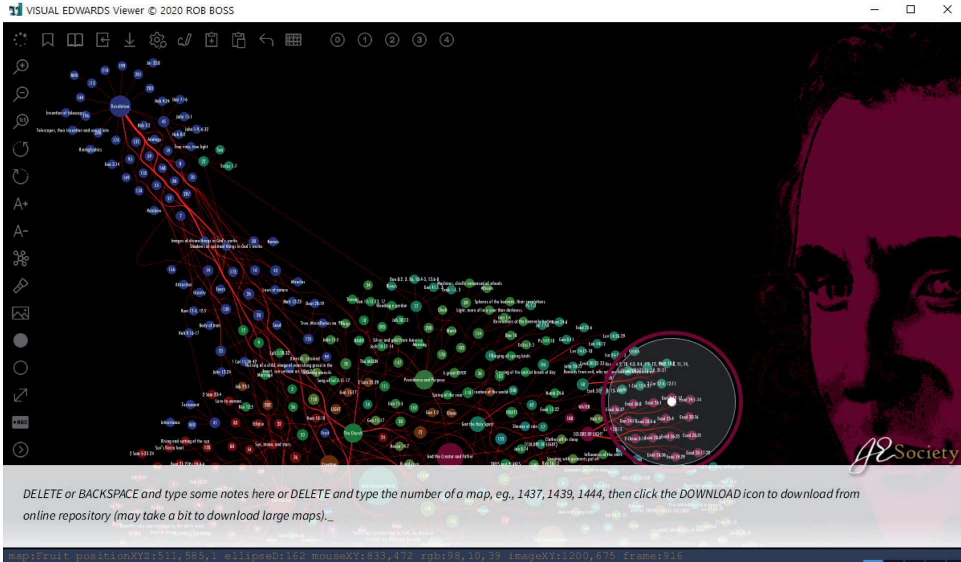
The research of Michał Choiński and Michael Keller are two notable instances of scholarship utilizing the new tools of Digital Humanities to research questions that were out of reach in a pre-digital age. Choinski's decade long study of the language of colonial revivalism issued in his book, *The Rhetoric of Revival* examines the powerful impact of the Great Awakening preachers upon their hearers (Choiński 2016). With a digital tools Choiński and his fellow colleague, Jan Rybicki, pursued this figuritive complexity of Edwards' vast sermon corpus, and also analysed with stylometry the author/editor relationship between Edwards and his literary agent, Thomas Foxcroft.[4] In his doctoral research, Micheal Keller demonstrated through quantitative data analysis the development of Edwards' rhetorical principles in his sermon corpus. Keller revealed Edwards' use of logic, emotion, with an emphasis on imagery to make Scripture experiential and excite his hearers toward a religious experience (Keller 2018).

Visual Edwards adds to these studies of Edwards' corpus by enabling a creative exploration of the letterpress edition of *The Works of Jonathan Edwards.* The project aims to assist students and scholars in their study of Edwards. The project's goal is cartographic in nature. A *Visual Edwards* provides a distant or meta-reading which displays shapes, contours, and conjunctions within his writings, while, at the same time, providing the reader with immediate reference to his text with exact page locations in volumes 1–26 of the Yale edition of his *Works.* The aim of the *Visual Edwards* is to visually unlock Edwards' writings, map intricate connections in his thought through an interface navigable by touchscreen, mouse, and keyboard. Users are able to create beautiful and accurate visualizations of Edwards to enhance their research interests.

3 https://dhlab.yale.edu/projects/edwards.html

4 https://computationalstylistics.github.io/projects/edwards/

Screenshot of *Visual Edwards* viewer displaying a network graph of theological connections in Edwards' notebook "Images of Divine Things"

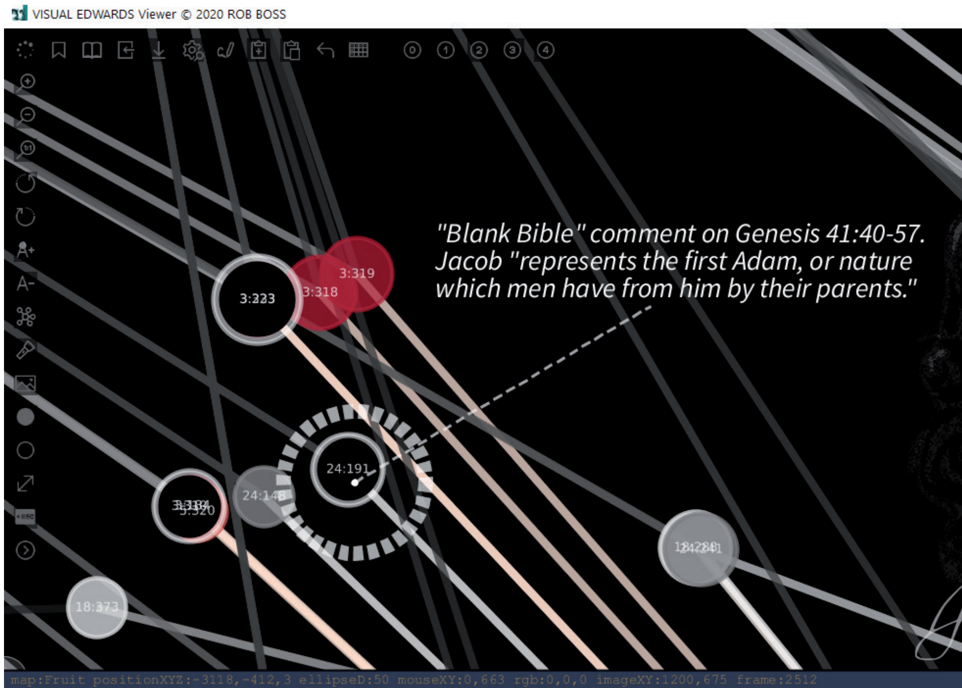


Project History

The *Visual Edwards* project was conceived as an idea sometime in 2007 as I was contemplating the possibility of visualizing the natural typology of Jonathan Edwards, specifically his notebook "Images of Divine Things." After experimenting with various strategies in an attempt to outline the connections in his typology, I found that a simple hierarchical outline or tree map was incapable of capturing the complexity of his system. Progress was made once I started thinking of his "Images" notebook as a complex network of data. The task before me at that point was to create structured data which could be queried in such a way to produce theological visualizations which reflected the connections in Edwards' natural typology. After this was accomplished, a fellow Edwardsean, Mark Hamilton, challenged me to create a similar system to visualize the connections in Edwards' "Miscellanies." I was able to envision and build a new data structure that would enable one to visualize the web of connections in the "Miscellanies." Eventually, the data structure was modified and extended to include all of *The Works of Jonathan Edwards,* volumes 1–26 print edition.

By the time I had satisfactorily completed the foundational dataset for the *Visual Edwards* project, there was no easy way to share it with others. The next phase of the project moved beyond the creation of static visualizations to the development of software which would be able to manipulate the images. The first step involved creating a viewer written in the Processing programming language. This viewer enabled the user to load visualizations with document images, zoom and pan, record motion, attach notes, create slides and PDF files, create sticky note diagrams, and more. Creation of the viewer was a big step towards making *Visual Edwards* available to others who might be interested.

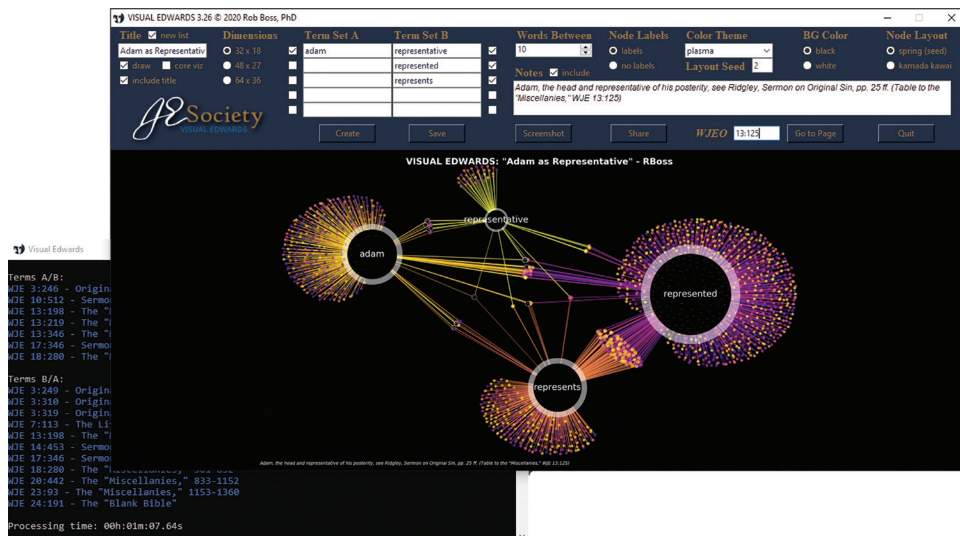
Screenshot of *Visual Edwards* viewer zoomed in on a visualization with an annotation



There were still limitations and challenges: chiefly, the software was a primarily viewer; it did not directly manipulate the dataset or create the visualizations. Data creation and manipulation was accomplished through the use of external software. There was a technical gulf between the creation and viewing of *Visual Edwards*. This was less than satisfactory because that placed me in the position of sole creator of visualizations. The ideal situation would be one where the users could construct their own queries and create their own visualizations. This technical gulf was bridged with graph building software I developed in the Python language. With a push-button-easy interface, the *Visual Edwards* builder software enables the user to create a visualization based on query terms, simple phraseology parameters, select highlight points, visual layout and color scheme, and more. The visualizations can then be easily edited with external bitmap or vector editors, or imported directly into the viewer with a simple button click.

The *Visual Edwards* builder and viewer work together to enable users to create an unlimited number of visualizations based upon the Yale letterpress edition of Edwards' works. New shapes and contours of Edwards' writings are brought into view. The *Visual Edwards* software enables users to explore Edwards in a new way, at the page and phrase level, and exports files in a variety of formats suitable for presentation, video production, and more.

Screenshot of *Visual Edward* builder displaying
network visualization of "Adam as Representative"



The *Visual Edwards Library* is an online resource with a growing number of visualizations created with *Visual Edwards* software. Users of the Windows software have the option of instantly publishing their maps of *The Works of Jonathan Edwards,* volumes 1-26 in the online *Library.* Each downloadable PDF file is accompanied by a text transcript of the terms and settings used to generate the visualization. Highlighted reference nodes in the visualizations identify locations of phrases or terms in close proximity to each other. The term lists are combined into a matrix which locates both forward and reverse occurrences of Edwards' words in all combinations.

The *Visual Edwards* project is not only digital, but print also. In December of 2018, an international body of Edwards scholars contributed to *The Miscellanies Companion,* the first print publication of the *Visual Edwards* project.[5] The essays in this initial volume canvas a wide range of topics contained in Edwards' "Miscellanies," including Trinitarianism, Millennialism, Reason and Revelation, Evangelism, Happiness, Salvation, and more. The foreword to this volume was contributed by Douglas A. Sweeney, noted Edwards scholar and editor of volume 23 of Yale's *The Works of Jonathan Edwards*. Work on *The Miscellanies Companion, Volume 2* is underway with a foreword by Kenneth P. Minkema, Executive Director of the Jonathan Edwards Center at Yale University.[6]

Theology, Technology, and Art

Visual Edwards is an active project developing at the intersection of technology, theology, and art—a foray into the media-driven, tech environment of the twenty-

5 https://www.jesociety.org/the-miscellanies-companion/

6 https://www.jesociety.org/call-for-papers-the-miscellanies-companion-volume-2/

first century. Edwards' sophisticated and image-rich theology is a perfect match for today's digital culture. Visualizing Jonathan Edwards is a Himalayan task, seemingly without end. To echo Edwards' sentiment in "Types," "there is room for persons to be learning more and more…to the end of the world without discovering all" (Edwards et al. 1993, 152).

Works Cited

Choiński, Michał. *The Rhetoric of the Revival: The Language of the Great Awakening Preachers*. New Directions in Jonathan Edwards Studies. V&R Academic, 2016.

Eco, Umberto. *The Search for the Perfect Language*. Oxford University Press, 1995.

Edwards, Jonathan, and Kenneth P. Minkema, ed. *Sermons and Discourses, 1723–1729*. Vol. 14 of *The Works of Jonathan Edwards*. Yale University Press, 1997.

Edwards, Jonathan, and Thomas A. Schafer, ed. *The Miscellanies, a-500*. Vol. 13 of *The Works of Jonathan Edwards*. Yale University Press, 1994.

Edwards, Jonathan, and Peter J. Thuesen, ed. *Catalogues of Books*. Vol. 26 of *The Works of Jonathan Edwards*. Yale University Press, 2008.

Edwards, Jonathan, Wallace E. Anderson, Mason I. Lowance Jr., and David H. Watters, eds. "Images of Divine Things." *Typological Writings*. Vol. 11 of *The Works of Jonathan Edwards*. Yale University Press, 1993.

___ . "Types." *Typological Writings*. Vol. 11 of *The Works of Jonathan Edwards*. Yale University Press, 1993.

Edwards, Jonathan, and Wilson H. Kimnach, ed. *Sermons and Discourses, 1720–1723*. Vol. 10 of *The Works of Jonathan Edwards*. New Haven and London: Yale University Press, 1992.

Hambrick-Stowe, Charles E. *The Practice of Piety: Puritan Devotional Disciplines in Seventeenth-Century New England*. University of North Carolina Press, 1982.

Keller, Michael. *Experiencing God in Words: Rhetoric, Logic, Imaginative Language, and Emotion in Jonathan Edwards' Sermons: A Computational Analysis.* Vrije Universiteit Amsterdam, 2018.

Lewis, C.S. *Surprised by Joy*. Inspirational Press, 1986.

Reas, Casey, and Ben Fry. *Processing: A Programming Handbook for Visual Designers and Artists*. MIT Press, 2014.

Steffen Wöll

Voyages Through Literary Space: Mapping Globe and Nation in Richard Henry Dana's *Two Years Before the Mast*

Abstract: In his youth, Richard Henry Dana Jr. rebelled against the conventions of his upper-class New England upbringing when he signed on as a common sailor on a merchant ship bound for Alta California. The notes of his travels describe the strenuous life at sea, a captain's sadistic streak, a crew's mutinous tendencies, and California's multicultural fur trade economy. First published in 1840, Dana's travelogue *Two Years Before the Mast* became an unofficial guide for emigrants traversing the largely unmapped far western territories in the wake of the Mexican-American War. Connecting Dana's widely-read narrative to current developments in the discipline, this article discusses strategies of visualizing literature and includes an exercise in 'discursively mapping' actual and imagined spaces and mobilities of the text. Considering strategies and toolsets from the digital humanities as well as theories such as Lefebvre's concept of representational space, the article reflects on the methodological and practical pitfalls brought about by the visualization of spatial imaginations as part of a more digitally literate and spatially conscious American Studies.

Keywords: space, literature, digital humanities, visualization, geography, mapping

Departure: The Atlantic World

> We must come down from our heights, and leave our straight paths for the by-ways and low places of life, if we would learn truths by strong contrasts.
> Richard Henry Dana, *Two Years Before the Mast*

When Richard Henry Dana Jr. returned to San Francisco in 1859 after an absence of almost a twenty-five years, he found out that he had become a man of considerable fame on the West Coast. Largely unbeknownst to himself, "almost … every American in California had read" his travelogue *Two Year Before the Mast* (1840). As an adolescent, Dana studied law at Harvard when he caught the measles, leading to an inflammatory condition that affected his eyesight and thus his ability to read and study. The son of a well-to-do family, he surprised his parents and friends by deciding against the traditional coming of age rituals of the New England upper classes that included extended educational travels to the venerable resorts and institutions of Europe. Instead, Dana marched to Boston harbor. There, he signed on the *Pilgrim*, a merchant vessel bound for Alta California via Cape Horn and Chile, joining the ship's motley crew as a common sailor. Some regard the notes of his voyage to California, the strenuous life at sea, and brutal regime of the ship's captain as the inspiration for Melville's epoch-making *Moby-Dick* (Malanowski). Because the resulting book was one of the few (and of those, perhaps the most readable) depiction of California written in English, Dana shaped the expectations of many American emigrants who moved into the newly acquired Californian territories after the Mexican-American War in search for gold, land, and economic opportunities.

The present article retraces Dana's journey around the Americas and his time on the West Coast, connecting his widely-read narrative to reflections of past and present developments of a transnational and digital American Studies. The following reflections consider strategies of visualizing and mapping actual and imagined spaces and mobilities in literary and other cultural productions. They present an attempt of exemplarily interfacing techniques of close reading and literary critique with the possibilities that digital humanities tools as well as literary and cultural geographies offer researchers. In a practical exercise, this potential–as well as its technical and methodological challenges–will be tested by creating of a 'discursive map' that tries to illustrate the spatial imaginations and global connections in *Two Years Before the Mast*.

"The Wrong End of the Telescope": Transatlantic America

Dana was a child of New England and started his journey to California in Boston as one of the principal harbors of what David Armitage called the "Atlantic world." In American Studies and elsewhere, the Atlantic turned into a focus of transnational research not least because it offers "one of the few historical categories that has an inbuilt geography, unlike the histories of nation-states with their shifting borders and imperfect overlaps between political alliances and geographical boundaries" (Armitage 11). From a U.S. perspective, the Atlantic was and continues to be a nexus of spatial imaginations and spatialization processes: First, as a frontier of European civilization that displaced the Mediterranean as the hotbed of culture and commerce. Second, as a canvas of maritime networks that mobilized the exchange of peoples (including merchants, migrants, and slaves), goods, and ideas. And third, as a dynamic space of colonialism, revolution, and independence.

Unusual as it was for someone of Dana's social standing, in the historical context of the mid-1800s his journey also exuded the westward-directed narratives of the expanding nation-state symbolized by frontier farmers, mountain men, and hyper-masculine trailblazers such as Daniel Boone and Davy Crockett. At their core, the discourses of utopianism and Otherness that energized the narrative formatting of western regions rested upon tensions of transatlantic mental geographies that separated but also connected the United States and Europe. The continental West became the physical and mental arena in which the postcolonial nation could transcend the binary that traditionally divided the world into European colonizers and the colonized populations of 'Other' continents. The revolutionary act of breaking through this seemingly 'natural' order meant that an American nation-state. was able to mythologize itself as an exception–first through independence and subsequently during the course of westward expansion. As a result of Frederick Jackson Turner's historicizing of the frontier at the end of the nineteenth century, the nation *ex post facto* integrated itself within an alternative mental cartography that was neither driven by European imperialism nor by colonial subalterns. Instead, the West's spatial and sociocultural dynamics became part of an unprecedented spatiotemporal ontogenesis that gave birth to a uniquely American character and place in the world.

In literature, this character (sometime referred to as American Adam) became synonymous with the emergence of an equally 'exceptionalist' strand of national literature that developed during the American Renaissance between the 1820s and

1860s. The canonical works by Whitman or Melville, but arguably also by Dana, codified the central themes of America's transatlantic origins and continental identity.[1] At the same time, embracing these spatial metanarratives also meant that the progression of said history and identity became path-dependent on a specific geographic trajectory that linked epochal and ideological progress with the transformative and colonizing movement of American people and ideas, first on the continent and later in circum-Atlantic and Asian-Pacific regions. Despite its outspoken focus on the continent as an exceptional space, nation-building through westering remained closely intertwined with the Atlantic spatial imaginary; the more American authors and policymakers distanced themselves from the autocracies of Europe, the more they conjoined the epistemic stability of the American nation to its transatlantic history.

This correlation produced some paradoxical effects such as the notion that the exceptionality of the American space would reveal itself not from within the country itself but only from an Old-World perspective. For instance D.H. Lawrence pondered that "it is perhaps easier to love America passionately, when you look at it through the wrong end of the telescope, across all the Atlantic water" (54). Mastering the Atlantic thus became a prerequisite to mastering the West and, by extension, the promises held by imperial ventures across the globe. During his travels, Dana's initial enthusiasm regarding the westering of the nation gives way to more sobering experiences and a critical stance towards U.S. colonialism. Experiencing first-hand the aftermath of "intercourse with people from Christian America and Europe" in foreign spaces, he sees "the white men, with their vices" and diseases as "the greatest curse" for those who encounter them (Dana 308–9).

"A New World of Understanding": The Spatial Turn in American Studies

Visualizing and theorizing flows of people, goods, and ideas across the transatlantic realm in literary and cultural geography must be seen vis-a-vis the spatial turn in academia. During the later decades of the twentieth century, this turn denoted a break with a conception of space that, with little alterations, persisted well into the present time as a product of Enlightenment and early capitalism and understood space mainly in physical and territorial terms (Engel 3, Günzel 13).[2] Based on ongoing debates, cultural geography went through four major paradigm shifts: environmental determinism, regional geography, the quantitative revolution, and most recently critical geography

1 D.H. Lawrence depicted the ontogenesis of the American Adam as the rejuvenating process of colonial subjects becoming independent citizens: "That is the true myth of America. She starts old, old, wrinkled and writhing in an old skin. And there is a gradual sloughing off of the old skin, towards a new youth. It is the myth of America" (Lawrence 57–58).

2 The historical background of the spatial turn, of course, is much more complex, going back to the assumption that "[t]he great obsession of the nineteenth century was, as we know, history: with its themes of development and of suspension, of crisis, and cycle, themes of the ever-accumulating past, with its preponderance of dead men ... the present epoch will perhaps be above all the epoch of space. We are in the epoch of simultaneity: we are in the epoch of juxtaposition, the epoch of the near and far, of the side-by-side, of the dispersed. We are at a moment, I believe, when our experience of the world is less that of a long life developing through time than that of a network that connects points and intersects with its own skein" (Foucault 22).

(Matthews and Herbert 50). Anchored in existentialism and chiefly interested in the social construction of space, the latter produced a wide array of poststructuralist approaches, among them Henri Lefebvre's seminal *La production de l'espace* (1974) whose English translation sparked renewed interest in the study of space in the humanities and social sciences. A new appreciation of spatial paradigms was thus "encouraged by the importation of French theory, in particular the work of Foucault, Lefebvre, de Certeau, and Virilio, which newly emphasized the power relations implicit in landscape under general headings like 'abstract space,' place, and 'symbolic place,' interpreted through new spatial metaphors like 'panopticism'" (Guldi).

Disruptive approaches upended traditional perspectives of spatial orders and narratives, for instance Jesse Levine's map "A New World of Understanding" (1982) that inverts the cartographic hegemony of the West world over a representationally subordinated Global South. Consequently, Sara Blair explains that "temporality as the organizing form of experience has been superseded by spatiality, the affective and social experience of space" (Blair 544). Places are therefore coming to be seen as "the outcome, not the backdrop, of social, cultural, political, and economic activity" (Powell 4). Since the 1990s, these ongoing developments manifested themselves in the transnational turn that has more recently unfolded into Atlantic, Hemispheric, and Transpacific Studies. They suggest a realignment of traditional East-West perspectives in favor of South-North and West-East dialectics of interpretation that reposition Latin America, the Caribbean, or the Asian-Pacific hemisphere as departure points of spatial discourses, hence destabilizing the conventional pillars of continental scholarship (Shu and Pease 13).

In her 2004 presidential address to the ASA, Shelley Fisher Fishkin endorsed an epistemology that positioned the United States "as part of a world system (and) pay(s) increasing attention to the historical roots of multidirectional flows of people, ideas, and goods and the social, political, linguistic, cultural, and economic crossroads generated in the process" (Fishkin 2004: 21–22). This approach benefits from new critical perspectives on seemingly closed-off topics and essentialized identities, aiming at the "worlding of American Studies" as the scrutiny of "U.S. culture within the context of the Americas and larger world systems" (Adams 730). As a result, the nation-state forfeited its status as an exceptional and monolithic entity to be increasingly understood as an "imagined community" (Anderson 1). Transnational inquiries thus shifted their focus from the continental seats of territorial power towards peripheries and border regimes, as well as practices and conditions such as migration, (im)mobility, and diaspora.

Mutiny: Building Global Connections

Viewed from these transatlantic and transnational outlooks, the themes that pervade Dana's *Two Years Before the Mast* constantly test the stability of borders and geographically discrete cultural and ethnic configurations. The text contains a diversity of transnational connections of that present ample testing ground for space-centric research and an attempt of visualization to follow below. During his voyage around Cape Horn, Dana's mind wanders between visions of California as his port of

destination as well as his and his crewmates' social and geographical positionality. As the *Pilgrim* makes her way down the coast of the American continent, Dana's view of an interconnected world and sense of its scale grow in equal measure. A conversation with the ship's African-American cook gives insights into the resulting trajectories of transnational and multi-ethnic discourse when the cook asks Dana,

> you know what countryman 'e carpenter be?' 'Yes,' said I; 'he's a German.' 'What kind of a German?' said the cook. 'He belongs to Bremen,' said I. … 'I was mighty 'fraid he was a Fin ….' I asked him the reason of this, and found that he was fully possessed with the notion that Fins are wizards, and especially have power over winds and storms. … He had been to the Sandwich Islands in a vessel in which the sail-maker was a Fin, and could do anything he was of a mind to. (Dana 46–47)

This sense of narratively (i.e. by superstitions and sailor's yarn) embellished spatio-cultural interconnectedness produces increasing spatial complexity, engendering in Dana a tendency towards fundamental and revolutionary change of previously held spatial imaginations. "Revolutions are matters of frequent occurrence in California," as he puts it (212). Toiling away under a sadistic captain who enjoys flogging subordinates who, irrespective of their racial or class background, have all become slaves under the heel of a tyrant that arguably served as inspiration for Melville's Captain Ahab. His violence and statements such as "'I'll flog you all, fore and aft, from the boy up!' — 'You've got a driver over aft, you! Yes, a slave-driver,—a *nigger-driver*!'" lead to Dana questioning the United States' ethnic segregation, slave economies, and the basic tenets of American democracy itself (126).

Digital Humanities and Literary Geographies

Drawing out these correlations means acknowledging the production of space in literature and asking for more systematic theoretical approaches to fill out "the outline of grand political overturns" in Dana's narrative (299). Frederic Jameson, for example, pointed to the vanishing of distinguishable cultural regions in the global environment of the "superstate" which are being erased by "the power network of so-called multinational capitalism itself" (Jameson 127). Others have emphasized the inherent masculinity of studying space, proposing that "to create geographic knowledge acceptable to the discipline—is to occupy a masculine subject position" (Rose 4). Embracing the interdisciplinary drive of the field of cultural geography, yet others are interested in the spatial dynamics of urban centers, suburbs, post-industrial wastelands, diasporic communities, barrios, refugee camps, ethno-linguistic borderlands, or cyberspace.

Concerning the digital nature of the latter, the possibilities offered by the digital humanities and methods such as distant reading are no longer orphan topics of the field. Italian literary scholar and founding member of the Stanford Literary Lab Franco Moretti promoted the usefulness of machine learning, quantitative analysis, network theory, and so-called computational criticism for the scrutiny of space in literature. In a radical approach, he argues that the sheer amount of literary data can no longer be effectively processed with time-consuming close readings. Instead

of relying on the biased and fallible human intellect, he therefore suggests a more mathematical treatment to make literature's vast cultural catalog more palpable. Or, as a more cynical commentator put it: "To understand literature ... we must stop reading books" (Schulz). On the one hand, widely available tools like Google's Ngram Viewer, geographic information systems (GIS), and mapmaking software provide instruments for the processing and visualization of space-related literary 'data.' On the other hand, this has led to a disruption of traditional representational power structures in the making of spatial discourses as the "business of mapmaking, of collecting spatial data and mapping it out, is passing out of the hands of the experts. The ability to make a map, even a stunning interactive 3D map, is now available to anyone with a home computer and an internet connection" (Crampton and Krygier 12). Critical cartography acknowledges this transition by combining "new mapping practices and theoretical critique (and) challenges academic cartography by linking geographic knowledge with power" (11). Some of its roots go back to nontraditional cartography such as Buckminster Fuller's "Dymaxion map" that projects the earth's surface onto a foldable icosahedron, revealing seemingly separate continents as an almost contiguous landmass and therefore de-emphasizing the East-West and North-South biases inherent in traditional cultural geographies.

In his essay "On Cartographic Techniques in Literature," Robert Smid utilizes diagrams, trajectories, and alphanumeric notations to "carr(y) out a reading of Thomas Pynchon's *Gravity's Rainbow* which focuses on how the diagrammatic inscription of the V2 rocket and its arc condition both the protagonists' movement on the novel's plane and the map-making instances in the narrative" (Smid 221). Apart from such intriguing yet largely insular forays, the usefulness of (critical) cartography and digital mapmaking techniques for literary studies remain uncertain. David Cooper and Ian Gregory caution that "identification and mapping of key words and emotional tropes may lead to the distorting marginalisation of the complexities and inherent contradictions embedded within literary articulations of space and place" (Cooper and Gregory 101, see Piatti 272).[3] And although some have stressed the "value of visualizing" certain spaces "not as a single entity but as a mosaic of interdependent, interlocking microregions, each with its distinctive landforms, climate zones, history, and blendings of culture," such a mapping of ever-smaller spatial units can obscure larger context and lead towards the balkanization of space (Kowalewski 16). Other questions impose themselves regarding distant reading techniques, for instance: How is a transparent and comparative criticism of sources possible if, as Moretti proposes, "we work on 200,000 novels instead of 200" (Moretti 1)? Digitized sources are regularly stored in protected archives and curated by information scientists untrained in literary studies and sometimes controlled by governmental or for-profit institutions. Finally, the elephant in the room materializes in the question of when (if ever) the algorithms of machine and artificial (intelligence) learning will be able to make sense of context, metaphor, irony, satire, or nuance?[4]

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3 See also Mark Monmonier's *How to Lie with Maps* (1991) and Daniel Kahneman's "A Perspective on Judgment and Choice: Mapping Bounded Rationality" (2003).

4 Moretti acknowledges these issues and "the great challenge of computational criticism: thinking about literature, removing meaning to the periphery of the picture" (2). In a *New York Times*

Making the Discursive Map

Acknowledging these challenges, the present article suggests a broader, more synthetic approach to the mapping of literary space. Instead of a concept adopted hastily, it approaches data-driven visualization as a supplemental tool for literary scholars. In *Mappings*, Denis Cosgrove rightfully asserts that "[t]he measure of mapping is not restricted to the mathematical; it may be equally spiritual, political, or moral. Similarly, the mapping's record is not confined to the archival; it includes the remembered, the imagined, and the contemplated" (Cosgrove 2). A healthy amount of skepticism about trends toward fast-track digitalization in the humanities, however, should not be taken as negating the importance of mapmaking for the historical development of placemaking. In fact, spatial formats such as empire and nation-state are closely associated with a revolution in fifteenth-century mapmaking and printing that made available the "representational space of maps (to) the political practices of rulers and states" (Branch 1). From a twenty-first century literary studies perspective, however, other questions come to the fore:

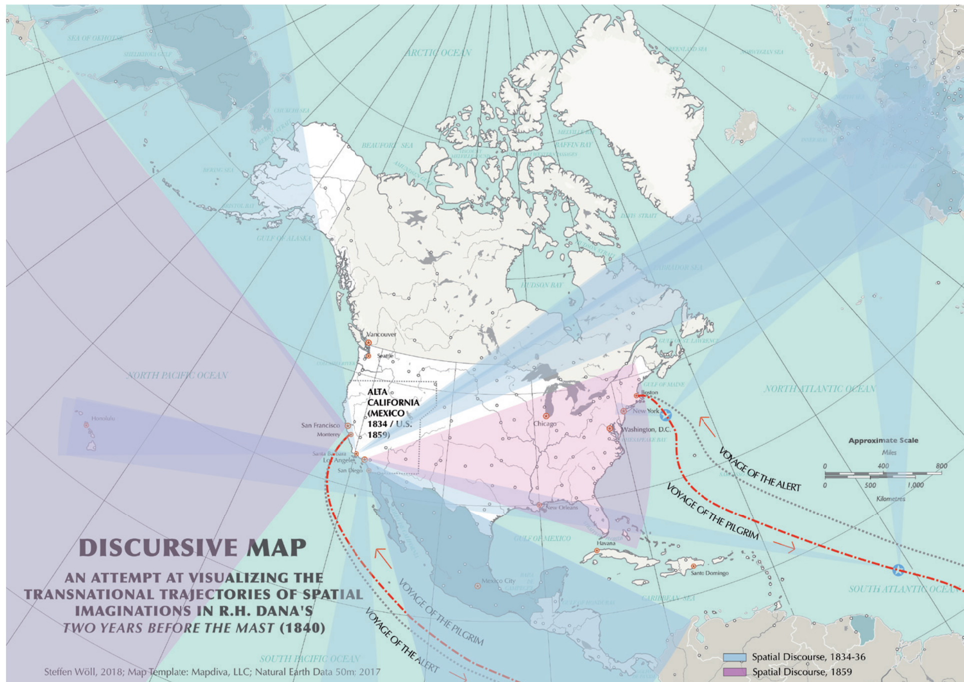


Figure 1: Steffen Wöll, Concept of a discursive map based on Richard Henry Dana's *Two Years Before the Mast* (1840)[5]

review, Kathryn Schulz sardonically deconstructs the shortcomings of distant reading, noting that Moretti "defines 'protagonist' as 'the character that minimized the sum of the distances to all other vertices.' Huh? O.K., he means the protagonist is the character with the smallest average degree of separation from the others, 'the center of the network.' So guess who's the protagonist of Hamlet? Right: Hamlet" (Schulz).

5 For a full-color, high-resolution version see https://steffenwoell.github.io/img/discursive-map-rh-dana.png.

- Which spatial discourses, interactions, and dynamics are at play in a text and how can they be represented and analyzed in an accessible manner?
- What are the possible benefits and challenges of such an undertaking?
- Does mapping literature invariably result in a reduction of complexity?

The above map does not readily answer these questions. Instead, it serves as a conceptual and exemplary implementation of these considerations by example of Dana's travelogue. The blue beams illustrate recurring or detailed descriptions of spatial imaginations during the *Pilgrim's* initial voyage from Boston to California, as well as during Dana's time on the West Coast from 1834 to 1836, where he was occupied with loading and processing animal hides. In his spare time, he went on extended excursions, visiting cockfights, eating frijoles, or watching fandango performances (Malanowski). In *Two Years Before the Mast*, he records colorful anecdotes of the social and economic life in what contemporaries called the Far West. In the 1830s, Alta California was still a part of Mexico and a sparsely populated region whose economy was less driven by "the mania for gold" in "those brilliant countries scorched by the ardent sun of the tropics" some commentators on the East Coast believed, but rather based on agriculture and the open range horse and cattle industries (Irving 1). Controlled by a ruling caste of Franciscan priests and based on indentured servitude and the forced labor of indigenous subalterns, a Catholic mission system stretched alongside the coastline to San Francisco in the North.

Dana's records depict this region as a spatio-cultural assemblage that was geographically liminal, ethnically diverse, contested, and highly interconnected with other transnational and multilateral (e.g. economic, ethnic, and environmental) spaces, as illustrated by the various blue (here: light gray) cones that emanate from it. In this view of California, Native Americans, Mexicans, Anglo-Americans, English, Scots, French, Irish, Germans, Russians, and Hawaiians – all with their own interests and traditions – create a shared space structured by social and commercial cooperation, whose multiscalar composition becomes a source of constant fascination for the young man from the more ethnically uniform Boston.[6] Toiling at the fur company's hide house at San Pedro Beach, Dana writes:

> We had now, out forty or fifty, representatives from almost every nation under the sun, two Englishmen, three Yankees, two Scotchmen, two Welshmen, one Irishman, three Frenchmen (two of whom were Normans, and the third from Gascony), one Dutchman, one Austrian, two or three Spaniards (from old Spain), half a dozen Spanish-Americans and half- breeds, two native Indians from Chili and the Island of Chiloe, one negro, one mulatto, about twenty Italians, from all parts of Italy, as many more Sandwich-Islanders, one Tahitian, and one Kanaka from the Marquesas Islands. (198–99)[7]

6 Sandwich Islanders (i.e. people from today's Hawaii) used Dana's hometown as a catch-all term for everyone who hailed from the United States, calling them "Boston" instead of addressing them by their Christian names (Dana 308).

7 While he viewed California as connected to diverse ideas, cultures, and places, this did not mean that Dana drew these connections uncritically or without judgement. For example, about a trip to Monterey he writes that "[t]he Californians are an idle, thriftless people, and can make nothing

Accordingly, the map's blue (here: light gray) beams appear eclectic and transnational in their outreach. From a software standpoint, this effect was achieved with the program *Ortelius*, using a layered SVG file as a canvas, removing most preset layers (e.g. current border lines and cities) but keeping intact topographical key features such as rivers and bodies of water. In drawing the map, one unexpected issue was finding templates with historically accurate borders, which were moreover rapidly changing during Dana's travels. In the end, I resolved to manually sketching the outlines of the historical region of Alta California as it existed in the 1830s. A possible long-term solution for this might be the creation of custom map templates–a demanding task that requires time and some cartographic and computer design expertise. A lighter teal color indicates the reference points of spatial imaginations, i.e. to fill in the endpoints of the 'discursive beams.'

Making the beams semi-transparent emphasizes overlaps and concentrations of spatial discourses. But it also exposes the main flaw of using beams or cones as part of a design philosophy that intends to function as a visual metaphor for imaginary 'fields of vision' which the text projects into certain places and regions. In an unwanted side effect, however, the conical shapes overlap at random points, producing confusing effects. For example, the areas with the darkest shades of blue (here: gray) (i.e. those with the seemingly highest concentration of spatial discourse in the text) appear in the Celtic Sea and Bay of Biscay. The text, however, does not mention either location. More cartographically skilled colleagues suggested that using another form language (e.g. straight lines) would solve these problems. While this is true, it would in turn obfuscate central insights communicated by the map, namely the scalar contrast or difference in width between the (lighter) lighter and darker cones.

Arrival: A New World (of Problems)

The latter represent the ways in which Dana imagined the region that had become a part of the United States at the time of his second visit to the West Coast in 1859, a decade after "California 'broke out,' as the phrase is, in 1848, and so large a portion of the Anglo-Saxon race flocked to it" (468). His spatial imaginations now exhibit a marked change regarding the region's role in both national and global contexts. Dana euphorically describes the transformation of San Francisco from what he knew as a picturesque, multi-ethnic, and dusty hamlet to what he now deems the capital of "the sole emporium of a new world, the awakened Pacific" and "one of the capitals of the American Republic":

> When I awoke in the morning and looked from my windows over the city of San Francisco with its storehouses, towers, and steeples; its court-houses, theatres, and hospitals; its daily journals; its well-filled learned professions; its fortresses and light-houses; its wharves and harbor, with their thousand-ton clipper ships, more in number than London or Liverpool sheltered that day, itself one of the capitals of the American Republic, and the sole emporium of a new world, the awakened Pacific. … I could scarcely keep my hold on reality at all, or the

for themselves. The country abounds in grapes, yet they buy, at a great price, bad wine made in Boston and brought round by us" (94).

> genuineness of anything, and seemed to myself like one who had moved in "worlds not realized." (465)

As visible on the discursive map, this triumphant but also more reductive imagination of San Francisco and California has merely two central reference points, as represented by the darker cones: First, the American nation-state in the East, of whom the Far West is now a 'proud' and important, but still largely remote and 'passive' member. And second, the Asian-Pacific hemisphere in the West, whose markets and resources the Far West makes accessible for the nation. Santa Barbara, for instance, suddenly turns into "a part of the enterprising Yankee nation, and not still a lifeless Mexican town" (475). The erasure of imaginative complexity associated with imperial worldviews thus might be one central insight imparted by the discursive map.

The *Horror Vacui* of Methodological Emptiness

Still, some doubts remain about the map's contribution to more traditional, written analysis, especially because the map can hardly stand for itself and requires additional explanation. From a methodological angle, it appears problematic to diminish the thematic diversity that we as cultural and literary studies scholars engage with tools like close reading and alongside categories such as race, class, and gender. Thus, what might be the disciplinary benefits of creating potentially reductive graphical depictions illustrations? If anything, scholars should see this question as an invitation to critique and deconstruct even the most basic assumptions of such an undertaking and, while they are at it, the epistemic assumptions of map-making as one of the oldest instruments of exerting political / imperial power and ethnic hierarchies.

In fact, core methods of literary and cultural studies appear fundamentally incompatible and perhaps even antithetic to (digital) mapping and visualization as practices that traditionally hinge upon sets of empirical data. Taking recourse to Lefebvre's conception of space, this antithesis lies at the fault line between "representational space" (i.e. theories, ideas, affects, imaginations of space that can scarcely be tackled by numbers, but need to be examined in a narrative manner) and "representations of space" as data-driven models, measurements, and demographics that clend themselves to visualization more readily (Lefebvre 33, 42). There are certain exceptions to this adversity between textual/cultural dynamics and visualization, which might provide some possibilities to visualize certain aspects of textual spatiality: The literal spatial narrative found within a story itself, usually the (imagined) movement of a character that can be broken down along the line of certain themes, tropes etc. However, such mappings provide few insights apart from basic information regarding movement and (im)mobility. They may nonetheless as a descriptive tool for researchers to better understand certain aspects of spatiality. As Lefebvre proposes, representational spaces are always embedded in historical contexts; hence visualizing the historical formation (or timeline) of a representational (textual) space might facilitate analysis of a text. In praxis, such approaches still carry risks of circular reasoning and self-fulfilling prophecies as researchers create a map and subsequently perform a historical reading of said map, arriving at the same biased conclusions that perhaps motivated the map's creation to begin with.

Finally, one could think about mapping the (inter)textual relationships concerning particular aspects of spatiality to reveal shared characteristics or discrepancies that exist between spatial imaginations/representations either within one or among several texts. This approach enables literary cartographers to speculate how discourses create, promote, or subvert certain imaginations of space, for instance regional diversity or imperial homogenization in Dana's case. This approach might build upon the concept of collaborative "deep maps" or Digital Palimpsest Mapping Projects (DPMP) as suggested by Shelley Fisher Fishkin, which "would put multilingual digital archives around the globe in conversation with one another, using maps as the gateway. 'Deep Maps' could be read as palimpsests, allowing multiple version of events, texts, and phenomena to be written over each other—with each version visible under the layers" (Fishkin 2011: 1). While this might be the most promising approach, it too is fraught with several challenges, notably the lack of a sound hermeneutic groundwork to facilitate reliable and comparable extraction and translation of texts into data that lends itself to visualization. Another key issue remains our (lack of) understanding of the concept of 'data.'

The literary medium, it seems, can hardly be apprehended in a purely quantitative manner and the task of counting words may well be left to linguists. Conversely, the 'discursive data' visualized on the experimental discursive map illustrates an uneven set of qualitative, interpretive, and observer-dependent parameters. This is good news as the humanities provide access to a multitude of analytical lenses with a seemingly endless combinatory potential to encode and decode qualitative data sets. On the downside, this might also be the *coup de grâce* to any hopes of a common visual language or method in the emerging field of literary geography. The *horror vacui* of methodological emptiness thus continues. This leads us towards a technique that might be called 'conceptual mapping' and that emphasizes the production of independent maps, guided by the rules of their creators' hand-tailored methodological design. These maps are experimental in form and scale and depict soft parameters (i.e. narrative, tropical, allegorical, metaphorical etc.) rather than empirically falsifiable data.

Conclusion: Learning the Digital Ropes

For established practitioners, interested observers, and those currently planning their own projects, a digitally literate American Studies remains an open-ended endeavor and an ongoing learning process. On the one hand, the potentialities of the digital humanities promise radically new insights into seemingly closed-off topics and established readings. But they also necessitate leaving well-traveled analytical pathways while building upon the strengths of the field's inbuilt inter- and transdisciplinary foundations and foci across vectors of race, class, and gender. Like Dana, interested researchers need to leave their sheltered (yet at the same time immanently fragile) lives to embark on a methodological quest that does not always promise a clear reward at its end.

Like the Bostonian aristocrat who started a career as a sailor at the lowest rank, seasick, scrubbing planks, and taunted by more experienced seafarers and expert navigators, newly minted digital humanities scholars should be willing to suffer shipwreck in the troubled waters of an emerging field and be ready to start from

scratch, often gaining experience with new technologies instead of academic honors. In Dana's case, this notion surfaces in a transcontinental vision that painfully contrasts his self-imposed struggles in the Far West with his New England peers who opted for safer career choices in more well-established circles. "I could see them," Dana reflects, "walking off the stage with their diplomas in their hands while upon the same day their classmate was walking up and down a California beach with a hide upon his head" (Dana 319).[8] The pains of learning the digital ropes then might well be a long-term investment in the imagined spaces (digital humanities for us, California for Dana) that represent the future centers of activity and knowledge production.

Works Cited

Adams, Rachel. "The Worlding of American Studies." *American Quarterly*, vol. 53, no. 4, 2001, pp. 720–32.

Anderson, Benedict R. *Imagined Communities: Reflections on the Origin and Spread of Nationalism.* Verso, 2006.

Armitage, David. "Three Concepts of Atlantic History." *The British Atlantic World, 1500–1800*, edited by David Armitage, and Michael J. Braddick, Palgrave Macmillan, 2002, pp. 11–27.

Blair, Sara. "Cultural Geography and the Place of the Literary." *American Literary History*, vol. 10, no. 3, 1998, pp. 544–67.

Branch, Jordan. "Mapping the Sovereign State: Technology, Authority, and Systemic Change." *International Organization*, vol. 65, no. 1, 2011, pp. 1–36.

Cooper, David and Ian N. Gregory. "Mapping the English Lake District: A Literary GIS." *Transactions of the Institute of British Geographers*, vol. 36, no. 1, 2011, pp. 89–108.

Cosgrove, Denis. *Mappings.* Reaktion, 1999.

Crampton, Jeremy W. and John Krygier. "An Introduction to Critical Cartography." *ACME: An International Journal for Critical Geographies*, vol. 4, no. 1, 2005, pp. 11–32.

Dana, Richard Henry. *Two Years Before the Mast.* Houghton Mifflin, 1911.

Engel, Ulf. *Regionalismen.* de Gruyter, 2018.

Fishkin, Shelley Fisher. "Crossroads of Cultures: The Transnational Turn in American Studies: Presidential Address to the American Studies Association, November 12, 2004." *American Quarterly*, vol. 57, no. 1, 2005, pp. 17–57.

___ . "'Deep Maps': A Brief for Digital Palimpsest Mapping Projects (DPMPS, or 'Deep Maps')." *Journal of Transnational American Studies*, vol. 3, no. 2, 2011. https://escholarship.org/uc/item/92v100t0.

Foucault, Michel. "Of Other Spaces." *Diacritics*, vol. 16, no. 1, 1986, pp. 22–27.

8 Dana nonetheless launched a successful career, working as "a maritime lawyer and advocate for the rights of sailors and the downtrodden everywhere. He defended fugitive slaves and their rescuers" (Malanowski). His temper and choices nonetheless remained fickle and driven by impulse rather than rationality. Although *Two Years Before the Mast* sold 200,000 copies, he declined a ten percent royalty deal and instead opted for a single $250 payment and twenty-four free copies (see Dana xiii).

Guldi, Jo. "What is the Spatial Turn?" *Spatial Humanities*, 2011. http://spatial.scholarslab.org/spatial-turn/what-is-the-spatial-turn.

Günzel, Stephan. "Raum–Topographie–Topologie." *Topologie. Zur Raumbeschreibung in den Kultur- und Medienwissenschaften*, edited by Stephan Günzel, transcript, 2007, pp. 13–29.

Irving, Washington. *Astoria.* Thomas Y. Crowell and Company, 1836.

Jameson, Fredric. *Postmodernism, or, the Cultural Logic of Late Capitalism.* Duke UP, 1991.

Kowalewski, Michael. "Contemporary Regionalism." *A Companion to the Regional Literatures of America*, edited by Charles L. Crow, Blackwell, 2003, pp. 7–24.

Lawrence, D. H. *Studies in Classic American Literature.* Martin Secker, 1924.

Lefebvre, Henri. *The Production of Space.* Blackwell, 2011.

Malanowski, Jamie. "Before Moby-Dick, There Was 'Two Years Before the Mast.'" *Smithsonian Magazine*, 2015. https://www.smithsonianmag.com/arts-culture/before-moby-dick-there-was-two-years-before-the-mast-180955766/.

Matthews, John A., and David T. Herbert. *Geography: A Very Short Introduction.* Oxford UP, 2008.

Moretti, Franco. "Patterns and Interpretation." *Pamphlets of the Stanford Literary Lab*, vol. 15, 2017. https://litlab.stanford.edu/LiteraryLabPamphlet15.pdf.

Piatti, Barbara. "Mit Karten Lesen. Plädoyer Für Eine Visualisiere Geographie der Literatur." *Textwelt - Lebenswelt*, edited by Brigitte Boothe et al., Königshausen & Neumann, 2012, pp. 261–88.

Powell, Douglas Reichert. *Critical Regionalism: Connecting Politics and Culture in the American Landscape.* U of North Carolina P, 2007.

Rose, Gillian. *Feminism and Geography: The Limits of Geographical Knowledge*. Polity, 1993.

Schulz, Kathryn. "What is Distant Reading?" *The New York Times*, 24 June 2011. https://www.nytimes.com/2011/06/26/books/review/the-mechanic-muse-what-is-distant-reading.html.

Shu, Yuan, and Donald E. Pease. "Transnational American Studies and the Transpacific Imaginary." *American Studies as Transnational Practice: Turning Toward the Transpacific*, edited by Yuan Shu and Donald E. Pease, Dartmouth College Press, 2016, pp. 1–36.

Smid, Robert. "On Cartographic Techniques in Literature." *Zeitschrift für Anglistik und Amerikanistik*, vol. 66, no. 2, 2018, pp. 221–41.

Dennis Mischke

Cartographic Intertextuality: Reading *The Narrative of Captivity and Restoration of Mrs. Mary Rowlandson* with Geographic Information Systems

Abstract: *The Narrative of Captivity and Restoration of Mrs. Mary Rowlandson* from 1682 is not only famous –or infamous– for its brutal descriptions of the armed conflicts of King Philip's War, it is also a colonial document that contains both religious as well as spatial representations of Native American territories. This article proposes to analyze this entanglement of space and text with a combination of digital text analysis tools and geographic information systems (GIS). Applying the potentials of such technologies and methods to the study of captivity narratives like Mary Rowlandson's opens up new opportunities to better understand the interaction of writing and space in colonial New England.

Keywords: digital text analysis, Geographic Information Systems (GIS), digital humanities, spatial humanities, captivity narratives, knowledge representation, intertextuality, space and text

The genre of 'Captivity Narratives' has been recognized as an essential part of the canon of American literature for a long time (Pearce 1947, 1). Many captivity narratives that were conveyed from colonial New England have not only been regarded as foundational texts of US American literature (Zapf 2010, 15), they have also been studied as multiethnic and multimodal representations of knowledge in colonial contact zones (Zanger 1995). In addition to the popular and sensationalist descriptions of native Americans and the North American landscape that form a signature element of the genre, captivity narratives have also been seen as reflecting the interaction and crossing of different cultural formations in colonial settings (Bauer 1997). Especially the juxtaposition of different forms of knowledge that were conveyed in many stories of the genre have attracted a host of "ethnographic" studies and interpretations (Turner-Strong 1999). Read from this perspective however, many captivity narratives promoted a very one-sided image of the conflict between colonizer and colonized, native Americans and European Settles (Behrendt 2016, Burnham 1997). In fact, many captivity narratives from colonial New England deployed a "relentless rhetoric of hate" (Stievermann 2007, 269) and were written, edited and marketed across the Atlantic in order to incite prejudice, racism, hatred towards the colonial other (Haselstein 2002, Sayre 2010, Stratton 2014). Such stories and their literary "ethnography", as Ben-Zvi concludes, "even disguise a complex set of assumptions regarding Native American cultures, portraying them tacitly as both foreign to and objects of U.S. culture" (2008, IV).

Being mindful of the "negative cosmopolitanism" (Kent and Tomsky, 2018) of the genre therefore, a careful analysis of captivity narratives has to pay special attention to the ways in which different crossings, entanglements and representations of knowledge have shaped these painful intercultural encounters

in and beyond the Americas. Interestingly, adaptations and deflections of captivity stories can be found in almost all places of Anglo-European colonialism from the Mediterranean, Africa, Australasia, the Pacific and the Americas. Coeval with the colonial expansion of Europe, stories of captivity developed into "a vital circuit for transnational colonial discourse … and thus, [into] an instrument of colonial expansionism" (Stratton 17-18). Studied from the perspectives of colonial land-grabbing and its subsequent forms of enforced cultural mobility, captivity narratives constitute a set of literary-historical sources situated at the intersection between textual and spatial practices of imperialism. Not only do they combine and negotiate a variety of knowledge systems; they also shed a multifaced light on mechanisms of coping with the epistemological and ontological violence of colonialism on all sides.

In a digital study of one of the most prominent captivity narratives: *The Captivity Narrative by Mary Rowlandson* ([1682] 1997), my contribution to this special issue will examine the interaction of writing and cultural spaces in colonial New England and will focus on two distinct but integrated forms of textual positioning: intertextual and geospatial referencing. In studying these two knowledge systems–literary representations of landscapes and literary invocations of certain textual traditions–my paper will employ new methods of digital literary studies and the digital humanities. Enhanced and expanded by digital research methods in order to systematically discover, document and connect spatial as well as intertextual knowledge, my analysis will exemplify how geographic information systems (GIS) can be used to shed a novel light onto the relationship between intertextual (biblical) references and settler-colonial appropriations of Native American landscapes and spaces. My paper will begin with a brief discussion of the problems of interculturality, religiosity and cartographic knowledge in *The Narrative of Captivity and Restoration of Mrs. Mary Rowlandson*. I will then sketch the contours of my digital research design of combining the analysis of space with a study of intertextual references in the text. I will then discuss exemplary results of a digital mapping of religious and intertextual references in the text and will finally draw conclusions about the way the story of Mary Rowlandson deploys the Old Testament as a rather ill-fitted navigational tool for the colonial space of New England during King Philips war.

Interculturality, Cartographic Practices and the Representation of Knowledge in *Mary Rowlandson*

The Narrative of the Captivity and Restoration of Mrs Mary Rowlandson (1682), provides a significant example for the cultural and political influence of captivity narratives and its significance in colonial America. The story of Ms. Mary Rowlandson, who was captured by Narragansett people in 1675, was printed and reprinted in the 17th, 18th, and 19th centuries and was repeatedly circulated in both New England and Europe. The text which depicts indigenous violence against an apparently innocent and defenseless settler-women in a rather drastic manner, was not only a bestseller at its time of publication. It also fulfilled an important

political function from the colonial powers' point of view: captivity narratives such as the story of Mary Rowlandson were used to satisfy the curiosity of European readers while legitimizing all kinds of violence against indigenous people. In fact, captivity narratives can even be seen as "the first long-range tactical weapons ... and [were] thus an instrument of colonial expansionism" (Stratton 18). Indeed, in these stories we learn, as the Aboriginal writer and intellectual Larissa Behrendt recently put it, "more about the colonizer than about the colonized" (180). In fulfilling this rather tactical function however, captivity narratives unfold an enormous cultural complexity, especially with regard to representations of colonial knowledge. In promoting strong and deliberately sentimental images of transcultural contact zones, the genre has from the beginning also enabled strong counter-narratives. From this perspective, many slave narratives of the 18th and 19th centuries can be read as contrasting narratives of imprisonment, which to this day provide us with testimonies of the cognitive and cultural structures of imperial encounters between European and non-European civilizations. Among the most influential slave narratives that operate with modes of imprisonment are, for example, Olaudah Equiano's *Interesting Narrative* ([1789] 2004) or the accounts of the life of the white American settler Mary Jemison, who was once abducted by the Seneca tribe in Ohio and simply refused to return to the rather repressive environment of the Puritan colony.

Against this background, I assume that captivity narratives do not only contain historically relevant documents of complex encounter scenarios; next to the subtext of a Christian-religious salvation story, many captivity narratives –for which Mary Rowlandson can be regarded as prototypical–contain very concrete local descriptions and inventories of colonial and indigenous spaces. Especially the story of Mary Rowlandson has hence often been categorized as a "travel narrative" (Martin 1994). Looking at both the geographical and religious knowledge contained in these narratives thus allows us to draw conclusions about the survival strategies of both European settlers and Native Americans in moments of colonial *movements* and *encounters* (Ette 2004).

Although much has been written about captivity narratives as a genre, the methods of the Digital Humanities can pose new research questions and enable novel ways of looking at a textual formation that is generally considered to be well researched (Burnham 1997). For example, the digital recording, annotation and mapping of spatial knowledge in Captivity Narratives can provide us with valuable and novel information on how and in what way religious ideas spread in colonial America, both literarily and geographically. Above all, the interweaving of spatial descriptions and negotiations with the many Christian-religious references that permeate writing at the time, creates a particularly relevant research-context that has not yet been sufficiently explored. Although space itself has long been a prominent topic in cultural and literary studies (cf. Tally 2011), the combination of intercultural analyses and intertextual renderings of space with the help of digital tools is a novelty.

But how can digital tools and procedures help us to better understand the connection between the religious and text-driven localizations of culture,

literary descriptions of space as well as colonial land grabbing in the context of colonial America? More concretely, the question that I want to ask in the case of Mary Rowlandson is: how do place-names in the narratives correlate with Bible quotations in the literary text? Or more precisely: *When* textually and *where* geographically are certain Bible quotations used and with what effect? The text of Mary Rowlandson attaches religious beliefs and readings of the Bible to the spatial configurations of the narrated journey. As we follow the "captivity" and "restoration" of her "removes" into the heart of Native American land and back; Rowlandson's journey from the "town" into the 'wilderness' emerges as a very ambivalent and two-fold movement–a wandering through indigenous territory and a novel experience of alterity and spirituality. Looking at the many different and mostly verbatim quotations from the Old Testament that are sprinkled across the text Henwood (1997) has claimed that Rowlandson uses Biblical sources as a hidden and ostensibly legitimate way of self-expression as well as mental and physical orientation (170). I want to pick up on this hypothesis and start to focus on the connections between Biblical passages and the way space and place figure in the text. In creating what I call a 'cartographic intertextuality' *The Narrative of Captivity and Restoration* lends itself to a digital case study to inquire into the ways of knowing colonial spaces and especially into the ways in which New England colonists worked to overwrite the indigenous American landscape of 'the new world' with the intellectual textures of the 'old'.

But in what way can a digital analysis–sensitive to these questions– produce relevant insights for such basic research questions in American studies? Achieving a precise understanding of the multimodality of geographical, textual as well as religious appropriations of Native American landscapes in colonial America opens up new ways of approaching colonial cultural artefacts and structures of thought. In better understanding the connections between the textual and geographical dimensions of literary texts as a cartographic practice as well as ethical-religious recording of intercultural encounters can tell us more about the complex and complicit geography of knowledge in North America.

Digital-Analytical Transformations

In the following, I will sketch a digital workflow for the investigation of spatial and religious knowledge in the intertextual zones of encounter that *The Narrative of Mary Rowlandson* opens. On a conceptual-theoretical level, my research design starts from the premise that all literature eventually encodes, collects, negotiates and questions various forms of human knowledge (Borgards, 2013, Demmerling & Vendrell 2014). Consequently, literary and cultural studies no matter of what kind or method–can be understood as a form of knowledge-transfer, which is always preceded by an analytical text transformation. For example, before literary studies can make its object epistemologically accessible, the text must always be methodically *pre*processed and thus *transformed*. While hermeneutic or post-hermeneutic methods of text analysis realize this transformation primarily as an analog-cognitive procedure (underlining, marginalia, notes, analog maps, sorting,

etc.) the age of digital text technologies increasingly affords algorithmic and thus operationalizable (Ramsay 2012, Jockers 2013) ways of studying literature and the traces of knowledge it contains. Surely, regardless of procedure the final act of interpretation of literary works of art will always require an analog-cognitive – that is to say human–course of action. However, in using algorithmic and (semi) automatic approaches of "Distant Reading" (Moretti, 2005 etc.) scholars can produce completely novel avenues into even well-researched materials.

In order to analyze and visualize specific places and corresponding intertextual representations in the text of Mary Rowlandson, an openly available Geoinformation system (GIS) for the Digital Humanities–the DARIAH-De Geobrowser–as well as text technologies such as AntConc[1], Voyant Tools[2] and the Sandford Named Entity Recognizer[3] were used in this project. In a first step the project Gutenberg edition[4] of the text was lemmatized to ensure a more accurate digital processing of the text (preprocessing). A lemmatization entails the transformation of all inflected words of a text into its basic form (its lemma). This step of text preprocessing and tagging was accomplished with the DARIAH-EU DKPro Wrapper[5], as well as the Sandford Named Entity Recognizer. The subsequent semi-automatic annotation of relevant entities such as place names was than gathered on a datasheet and inspected manually. Approximately half of the places named in the text were automatically recognized by the preprocessing pipeline. Place names not recognized or falsely recognized by the Named Entity Recognition tool were either highly ambivalent place names such as *Providence* or non-indexed indigenous place names like *Wenimesset*. Missing, misrecognized or falsely referenced place-names were corrected and annotated manually. A final data table including place names from the story was then semi-automatically georeferenced via the Getty Thesaurus of Geographical Names (TGN)–embedded into the DARIAH-DE Geobrowser. This semi-automatic georeferencing pipeline was used to further disambiguate the places recognized and to enrich these with respective corresponding geocoordinates. Figure 1 shows the difficulties that arise with georeferencing even precisely annotated places such as *Lancaster*, where the journey of Mary Rowlandson starts: the Getty Thesaurus of Geographical Names includes more than 40 references to different places named Lancaster in the United States alone. Here a final manual disambiguation based on maps of the journey created by other scholars such as Henry Nourse[6] (1901), Mark Priewe at al. (2008) or most recently Lisa Brooks (2012) was required. Choosing the relevant places from the automatically suggested list of possible places named *Lancaster* retrieved relevant geo-coordinates such as longitude and latitude and automatically added these the imported spreadsheet with extracted place names from the story. The

1 http://www.laurenceanthony.net/software/antconc/

2 https://voyant-tools.org

3 https://nlp.stanford.edu/software/CRF-NER.html

4 https://www.gutenberg.org/files/851/851-h/851-h.htm

5 https://www.dariah.eu/tools-services/tools-and-services/tools/dkpro-wrapper/

6 http://coursesite.uhcl.edu/HSH/Whitec/ximages/earlyam/Puritans/rowlandson/rowlmapjourney.jpg

resulting map[7], illustrating one place for each chapter deviates only slightly from the maps drawn by Lisa Brooks (2018) or Priewe and Siewert (2018)[8].

Of course, tracing the movement of historical-literary figures based on estimated historical locations will always entail approximation. With regard to the question of accuracy and appropriateness however, Lisa Brooks' recent mapping of Mary Rowlandson deserves special attention not only only because her digital mappings in her awikhigan[9]–a complex (digital) indigenous notebook accompanying her book *Our Beloved Kin* (2018)–produces an entire array of elucidating mappings and remappings of the King Philips' war but also because both her book and the accompanying awikhigan revisit the story of Mary Rowlandson from the perspective of Native American history and tradition. Her maps and tracings are thus deeply knowledgeable of Abenaki history and culture and offer an impressive counter-narrative to the ethnographic re-reading of Mary Rowlandson. Inspired by her Abenaki ancestry and her unique access to the places narrated in the story of Mary Rowlandson Brooks has underpinned her maps with local fieldwork and a rich documentation of each places. Surely, no digital workflow will ever be able to live-up to the human capabilities of positioning the historical setting of the story. The fact that Lisa Brooks has also used digital maps and a GIS system to map the Native American trails used in by the Narragansett, Wampanoag, and Nashaway/Nipmuc people illustrates[10] in an interesting way the compatibility of digital tools with Native American knowledge traditions.

One of the most decisive epistemological advantages of geographic information systems is their affordance to add all kinds of data to complex digital representations of geographical space. In order to utilize this potential for the analysis of cartographic knowledge in the narrative of Mary Rowlandson, I decided to enrich the geodata retrieved from the story with the many biblical references made in the text. In fact, Mary Rowlandson's account is so rich in direct and indirect biblical references that I decided to focus on direct quotations from the old testament that occurred at least twice in the story. Using the web-based concordance and text analysis tool *Voyant* developed by Rockwell and Sinclair, I detected more than 500 distinctive phrases that occurred more than two times in the story[11]. Among those longer than 10 words, only direct bible quotations were found. Table 1 shows four of the longest phrases that occur at least twice in the novel. All of those four are direct quotations from the old testament – sometimes with, sometimes without reference to the psalm.

7 https://geobrowser.de.dariah.eu/?csv1=https%3A%2F%2Fgeobrowser.de.dariah.eu%2Fstorage%2F262751

8 http://www.arcgis.com/apps/MapJournal/index.html?appid=b76736c91d7d487c8ee7cc31f7a7675b

9 https://ourbelovedkin.com/awikhigan/index

10 https://amherstcollege.maps.arcgis.com/apps/MapJournal/index.html?appid=2fa5ce906bc749cf849d576feeb6a9d1

11 https://voyant-tools.org/?corpus=eb1af0e2f5f82a1f16cead74b7f64ae8&view=Phrases

	Term	Count	Length	Trend
1	oh that my people had hearkened to me and israel had walked in my ways i should soon have subdued their enemies and turned my hand against their adversaries psalm 81.13 14	2	32	2
2	me thus saith the lord refrain thy voice from weeping and thine eyes from tears for thy work shall be rewarded	2	21	2
3	through the waters i will be with thee and through the rivers they shall not overflow thee isaiah 43.2	2	19	2
4	for a small moment have i forsaken thee but with great mercies will i gather thee	2	16	2

Table 1 with phrases extracted from the text

In a further step, the derived cartographic and religious knowledge (places and biblical quotations) in the literary text were analyzed with regard to their position in the story. Interestingly, almost all twice-occurring bible references in Mary Rowlandson turned out to be symmetrically distributed throughout the text; with the 12th remove (chapter) positioned as the center. Figure 3 and 4 show the textual position of psalm 1 and 3 from the table above. Combining this insight from the textual distribution of bible quotations with the mapping of each remove, we begin to realize that the spatial and textual center of Mary Rowlandson's narrative is the turning point in the 12th remove. Even more, once we add the exact geolocations of the chapters in which each bible quotation is used, we begin to see that these Bible quotes are used in similar spatial settings before and after the turning point in the 12th remove.

After adding all detected bible quotations to a table with geodata created by the DARIAH-DE Geobrowser, we were able to see which biblical quotation was used at which point in the narrative, at which geographical location this happens and with what effect. Figure 5 is a screenshot of the datasheet created with the DARIAH-DE Geobrowser including chapters of the story, place names, used bible quotations as well as corresponding geo-coordinates. In a close inspection of the data and its subsequent vitalization via the cartographic interface of the DARIAH-DE Geobrowser, we realized that the most-often-used quotations in the text function both a metaphysical-religious as well as a real-world-spatial guide and orientation. What does that mean in detail? Let me explicate this with the help of one particular finding. For instance, with our data driven study of the cartographic intertextuality in Mary Rowlandson's captivity we found that the psalm Isaiah 43.2. ("When you pass through the waters, I will be with you and when you pass through the rivers, they will not sweep over you") is quoted two times in different chapters of the text, yet at very similar locations (the crossing of the "Paquaug River" (Millers River) (See Fig.6). In other words, Mary Rowlandson first uses psalm 43.2. on her outward journey with her Narragansett captors in the 5th Remove close to Wendel Depot at a crossing of the "Bacquag River" when colonial forces are unable to continue the pursuit of the Native American Party. The exact same psalm is quoted a second time at the exact same location, at another crossing of the "Paquaug River" this time however in the 15th remove. What is the meaning of this

complex entanglement of intertextual references and the cartographic knowledge with which Mary Rowlandson tries to position herself textually, religiously as well as spatially?

In the context of King Phillip's War the river is an especially significant site because it constitutes the border zone between colonial settlements and the remaining indigenous territories of the region and provided a safe-haven and retreat for the native warriors (Brooks 2018: 263). Connecting the intertextual references to the old testament with real-world geographical coordinates thus establishes a perspective onto the text that has received little attention thus far. The quotations of the Old Testament in the text of Mary Rowlandson can not only be understood as a religious compass, but actually, as a secular as well as spiritual toolkit for orientation. In particular the biblical context of the Book of Isaiah conjured up here, establishes a remarkable intertextual connection. The Psalm of the Bible (Jesse 43) in the OT, quoted twice here by the river–and quite obviously not arbitrarily at all–addresses Jews who were abducted to Babylon but to whom liberation, redemption and a manifest destiny is prophesied. Here, Mary Rowlandson's description of the landscape in the border region between the colony and Native American territory–imbued with biblical meanings–takes on a function of identity construction and the establishment of territorial sovereignty. Put differently, the landscape described by Mary Rowlandson at this very precise place appears not only as mythically charged, it is–so to speak–also "enriched"– spatially as well as ideologically (cf. Slotkin 1973, Turner Strong 1999).

Conclusion

The results obtained by my digital reading of Mary Rowlandson suggests that the text of Mary Rowlandson employs a very specific *cartographic intertextuality* to capture spatial as well as religious knowledge by literary means. Furthermore, the biblical references in the text of Mary Rowlandson do not only fulfil religious and metaphysical functions, but indeed describe Rowlandson's attempts to maintain a spatio-temporal and thus physical form of sovereignty in captivity. Of course, "Rowlandson and her fellow Puritans" as Hennwood points out, were first and foremost "people of the Book" and within the Puritan intellectual horizon the Bible was "a vast, roomy resource of expressive possibility an expansive vantage point from within which to articulate a literary fusion of personal emotion and collective mission" (Hennwood, 1997:183).

The fact that the intertextual references of the Old Testament in *The Narrative of Mary Rowlandson* actually serves as a very precise and site-specific device of navigation and orientation, opens novel avenues for digital research on colonial America. After all, the use of the Old Testament as a geographical device points to the fact that the European settlers were keen to simply overwrite all indigenous ways of landscape management and territorial sovereignty. In using The Old Testament as an artificial technology to encode the landscape and spaces of the "new world" in terms of the "old" reflects the granularity and scale of the epistemological violence with which the Puritans structured their incorporation of

Native American land. Despite this 'new' evidence found through digital readings of Mary Rowlandson's captivity text, the interpretation refers us once again to the very old and eminent questions about the conditions of experience of alterity per se (Mischke 2013). In the narrative spaces of colonial America, the mental and physical maps of the English settlers were for the most part unfitted or willingly made useless to recognize and–above all, to acknowledge–the rich landscape representations and landscape management of the Narrangansett, Wampanoag and Nipmuc people.

Works Cited

Bauer, Ralph. "Creole Identities in Colonial Space: The Narratives of Mary White Rowlandson and Francisco Núñez de Pineda y Bascuñán." *American Literature* Vol. 69, No. 4, 1997

Ben-Zvi, Yael. "Ethnography and the Production of Foreignness in Indian Captivity Narratives." *American Indian Quarterly*, Winter, 2008, Vol. 32, No. 1, 2008.

Behrendt, Larissa. *Finding Eliza Power and Colonial Storytelling*. St Lucia, Qld: U of Queensland, 2016.

Burnham, Michelle. *Captivtiy and Sentiment: Cultural Exchange in American Literature, 1682-1861*. Hannover: University Press of New England, 1997.

Borgards, Roland, ed. *Literatur Und Wissen: Ein Interdisziplinäres Handbuch*. Stuttgart: Metzler, 2013.

Brooks, Lisa. *Our Beloved Kin – A New History of King Philips's War*. New Haven, London: Yale University Press, 2018.

Ette, Ottmar. ÜberLebenswissen. *Die Aufgabe der Philologie*. Berlin: Kadmos, 2004.

Equiano, Olaudah. *The Interesting Narrative of the Life of Olaudah Equiano, Or, Gustavus Vassa, the African*. Ed. Shelly Eversley. New York: Modern Library, 2004. Print.

Demmerling, Christoph, and Íngrid Vendrell Ferran, eds. *Wahrheit, Wissen Und Erkenntnis in Der Literatur: Philosophische Beiträge*. Berlin: de Gruyter, 2014

Haselstein, Ulla. "Puritans and Praying Indians: Versions of Transculturation in Mary Rowlandson's Captivity Narrative (1682)." *Missions of Interdependence: A Literary Directory*. Ed. Gerhard Stilz. *Cross/Cultures: Readings in the Post/Colonial Literatures in English*. Amsterdam: Rodopi, 2002: 3-14.

Henwood, Dawn. "Mary Rowlandson and the Psalms: The Textuality of Survival" *Early American Literature,* Vol.32. No.2, 1997.

Jockers, Matthew Lee. *Macroanalysis: Digital Methods and Literary History*. Urbana: U of Illinois, 2013.

Kollatz, Thomas and Stefan Schmunk. "Datenvisualisierung: Geo-Browser und DigiVoy." *TextGrid: Von der Community für die Community – Eine Virtuelle Forschungsumgebung für die Geisteswissenschaften*. Ed. Heike

Neuroth et al. 2015, 165-80. <http://www.univerlag.unigoettingen.de/handle/3/Neuroth_TextGrid>

Martin, Wendy. *Colonial American Travel Narratives.* London: Penguin, 1996.

Mischke, Dennis. "Othering Otherness: Fictocriticism and the Cosmopolitan Vision." Eds. Jana Gohrisch and Ellen Grünkemeier. ALNEL Papers 18, Amsterdam: Rodopi, 2013.

Moretti, Franco. *Graphs, Maps, Trees: Abstract Models for a Literary History*. London: Verso, 2005.

Pearce, R.H. "The Significance of the Captivity Narrative." *American Literature,* 29, 1-20.

Ramsay, Stephen. *Reading Machines: Toward an Algorithmic Criticism*. Urbana: U of Illinois, 2011.

Rowlandson, Mary. *Narrative of the Captivity and Restoration of Mrs.mary Rowlandson: The Sovereignty and Goodness.* New York: W W Norton, 2014. Print.

Sayre, Gordon M., ed. *American Captivity Narratives: Selected Narratives with Introduction*. Boston: Houghton, 2000. Print.

Sayre, Gordon M. "Renegades from Barbary: The Transnational Turn in Captivity Studies." *American Literary History* 22.2 (2010): 347–59. Print.

Slotkin, R. *Regeneration through Violence: The Mythology of the American Frontier, 1600-1860.* Middletown: Wesleyan University Press, 1973.

Stievermann, Jan. "United States of America." In: *English Literatures Across the Globe.* Ed. Lars Eckstein. Paderborn: Fink Verlag, 2007. Print.

Stratton, Billy. *Buried in the Shades of the Night: Conteted Voices, Indian Captivity, and the legacy of King Philips's War.* Tucson: University Press, 2013.

Pearce, Roy Harvey. "The Significances of the Captivity Narrative." *American Literature*, 19.1 (1947): 1-10. Print.

Priewe, Marc and Siewert, Stefanie. "Digital Humanities und U.S. Amerikanische Captivity Narratives: Ein Forschungsentwurf." *Digital Humanities: Perspektiven aus der Praxis.* Ed. Bockwinkel, Peggy, Nickel, Beatrice und Gabriel Viehauser. Berlin: Frank and Timme, 2018.

Rowlandson, Mary White. *The Sovereignty and Goodness of God: With Related Documents,* ed. Neal Salisbury. Boston: Bedford Books, 1997.

Tally, Robert T. ed. *Geocritical Explorations: Space, Place, and Mapping in Literary and Cultural Studies*. New York: Palgrave Macmillan, 2011.

Turner-Strong, Pauline. *Captive Others: The Politics and Poetics of Colonial American Captivity Narratives*. Boulder CO: Westview Press, 1999.

Zanger, Jules. "Mary Rowlandson's Captivity Narrative as Confessional Literature: 'After Such Knowledge, What Forgiveness?'" *American Studies in Scandinavia*, 26.1 (1994): 142-152.

Images

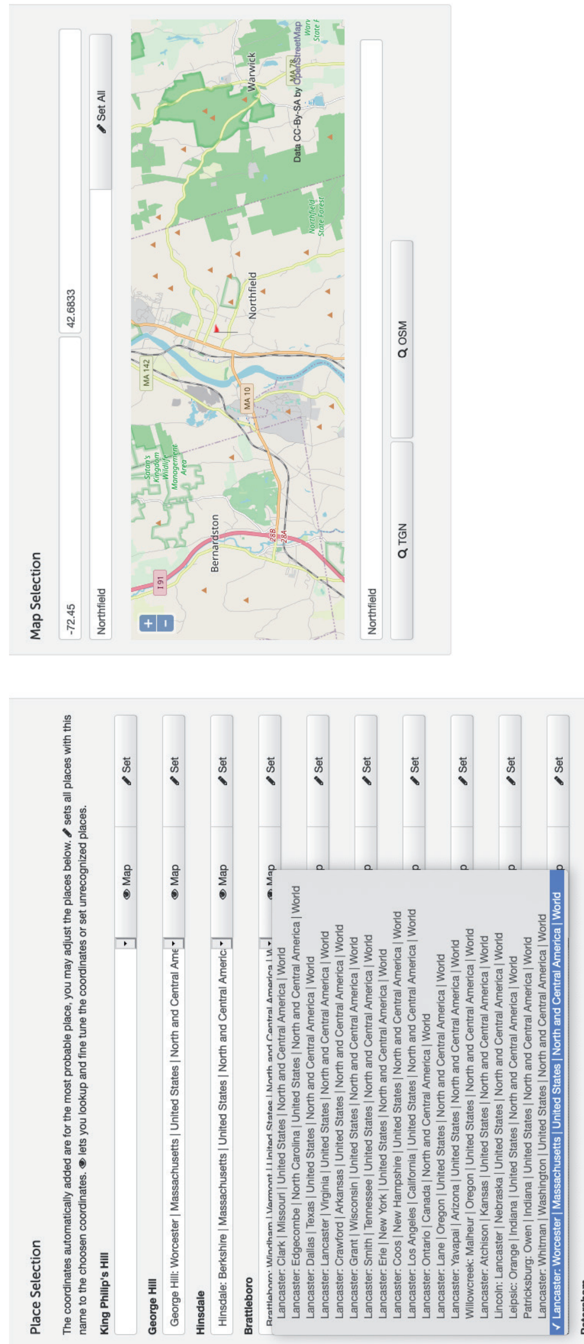


Figure 1: Screenshot of the place selection and geo-location completion tool of the DARIA-DE Geobrowser https://geobrowser.de.dariah.eu

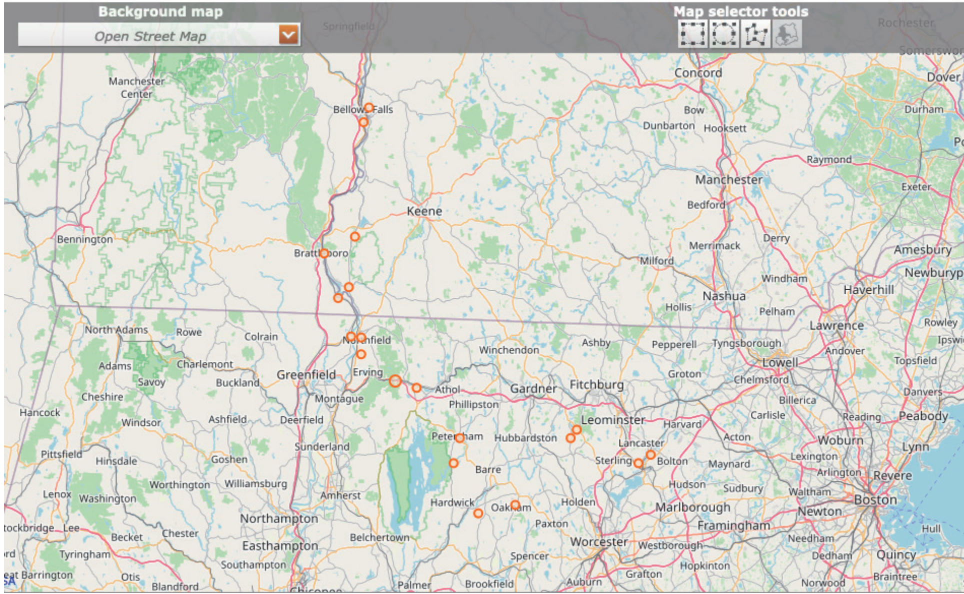


Figure 2: The exact locations drawn from the text. Each dot signifies one chapter of the story.

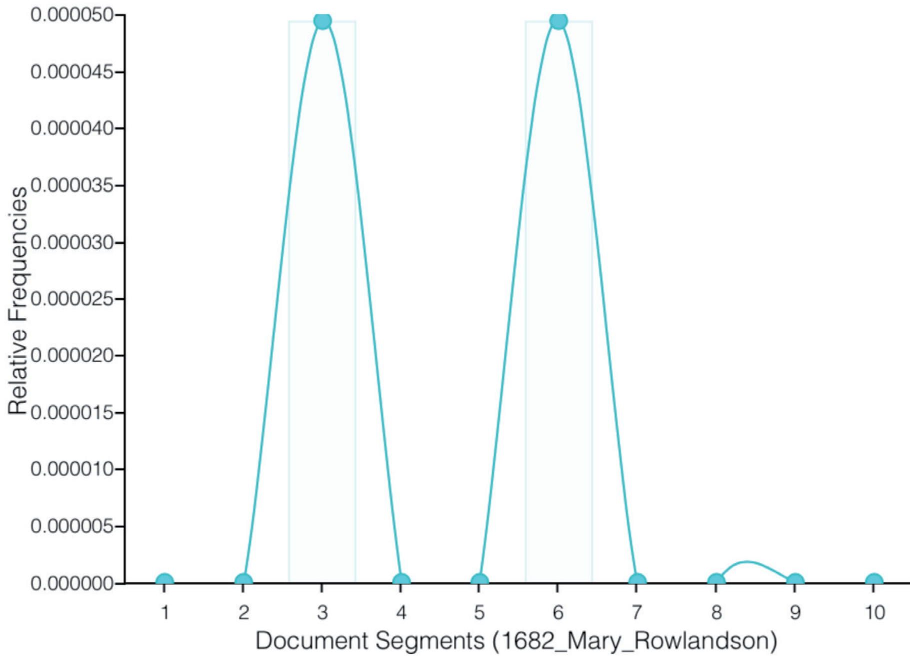


Figure 3: textual position of psalm 1

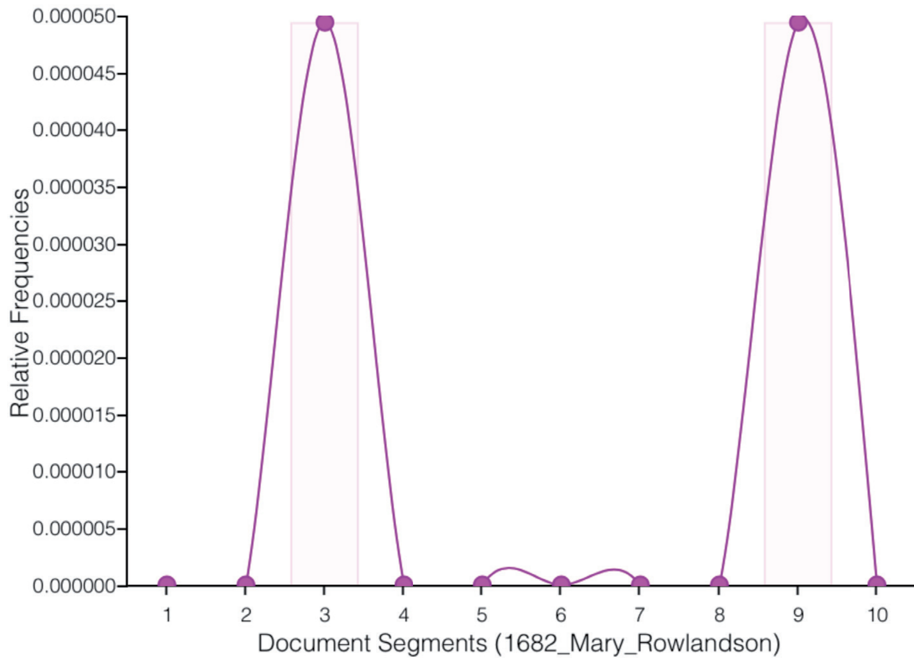
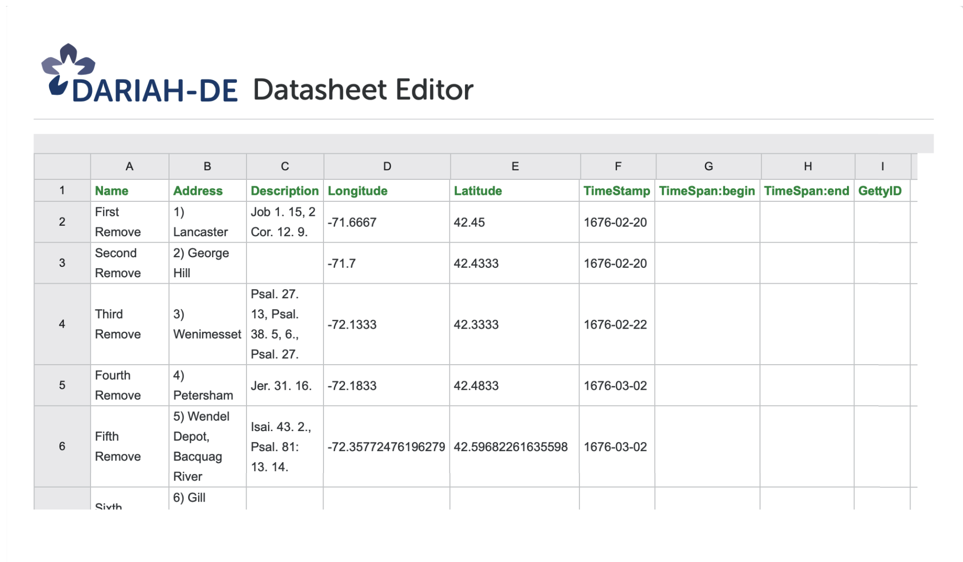


Figure 4: textual position of psalm 3



DARIAH-DE Datasheet Editor

	A	B	C	D	E	F	G	H	I
1	Name	Address	Description	Longitude	Latitude	TimeStamp	TimeSpan:begin	TimeSpan:end	GettyID
2	First Remove	1) Lancaster	Job 1. 15, 2 Cor. 12. 9.	-71.6667	42.45	1676-02-20			
3	Second Remove	2) George Hill		-71.7	42.4333	1676-02-20			
4	Third Remove	3) Wenimesset	Psal. 27. 13, Psal. 38. 5, 6., Psal. 27.	-72.1333	42.3333	1676-02-22			
5	Fourth Remove	4) Petersham	Jer. 31. 16.	-72.1833	42.4833	1676-03-02			
6	Fifth Remove	5) Wendel Depot, Bacquag River	Isai. 43. 2., Psal. 81: 13. 14.	-72.35772476196279	42.59682261635598	1676-03-02			
	Sixth	6) Gill							

Figure 5: Screenshot of the Datasheet-Editor of DARIAH-DE Geobrowser with assignments of Bible quotations and geodata

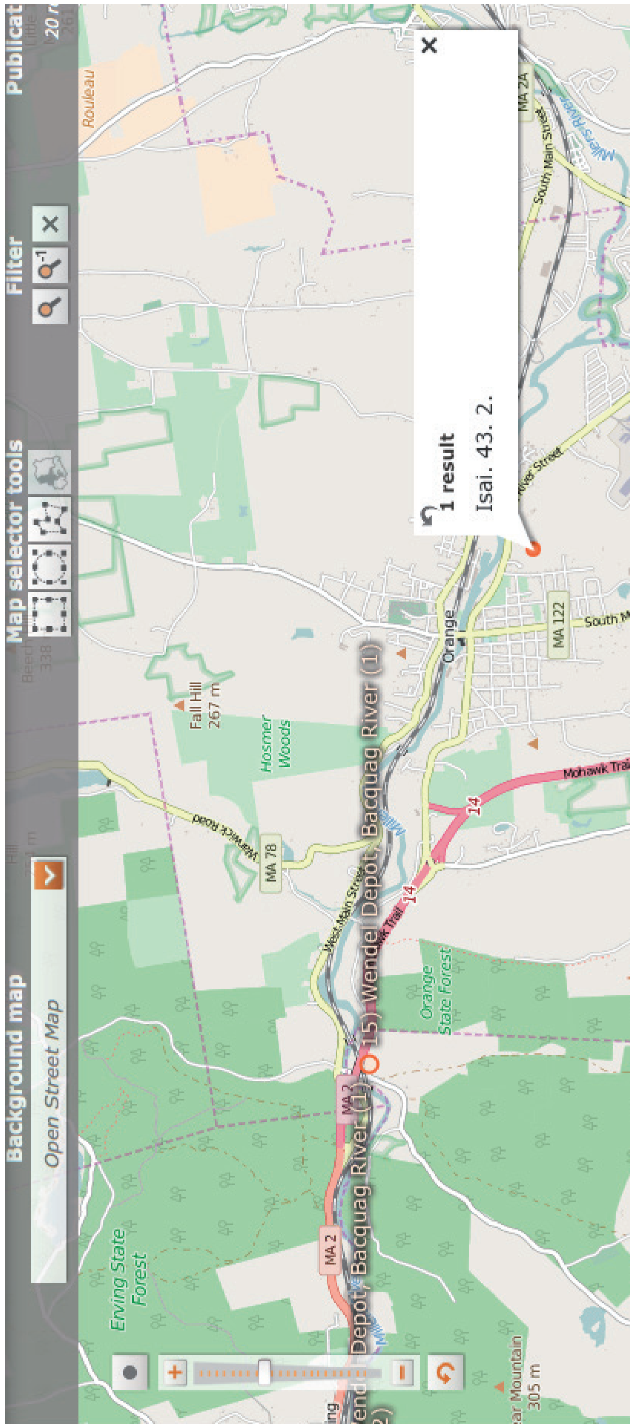


Figure 6: Psalm 43.2 occurrences in Mary Rowlandson with similar geolocation in different chapters.

Whit Frazier Peterson

A Magnificent Blond Beast: Exploring the Implications of Harlem Renaissance Writer Wallace Thurman as Ghostwriter of a Forgotten Celebrity Gossip Memoir

Abstract: In an early version of his article "Harlem Literati in the Twenties," first published in the Saturday Evening Review in 1940, Langston Hughes offers the curious suggestion that Wallace Thurman was the ghostwriter of *Men, Marriage and Me* (erroneously written as *Men, Women and Checks* in Hughes' article), the tell-all memoir ostensibly by the original blonde bombshell Peggy Hopkins Joyce. According to Hopkins' biographer, however, Basil Woon, an English playwright and gossip columnist was supposed to have been the ghostwriter of this book. My paper will address this discrepancy by focusing on the lack of evidence supporting the Woon theory, and through an analysis using stylometry, close reading and an examination of historical documents, I will argue that Thurman is the more likely candidate as a ghostwriter for Hopkins' memoirs, just as Hughes suggests. I will be looking specifically at the way the text, which is presented to the reader as a diary written by Hopkins from her early youth to the present day, satirizes the shallowness and excesses of the "roaring twenties." I will argue that the text is clearly ironic and satirical in style and approach and not only satirizes celebrity, but also a society that unselfconsciously celebrates celebrity, much the way Thurman satirizes the excesses of the Harlem Renaissance in his novel *Infants of the Spring*. In conclusion, I will show how this book, which has been largely dismissed as celebrity gossip, is transformed into something highly literary by the way Thurman, as ghostwriter and editor, takes Hopkins' life story and turns it into a satire of the excesses of an era.

Keywords: Wallace Thurman, Harlem Renaissance, Peggy Hopkins Joyce, satire, stylometry, author attribution, Friedrich Nietzsche, Langston Hughes, Basil Woon, the jazz age

This literary riddle begins with an obscure early version of a fairly well-known essay by Langston Hughes. The article, "Harlem Literati in the Twenties," first appeared in the *Saturday Evening Review* in the June 22, 1940 issue. In this issue, Hughes writes, referring to his friend and Harlem Renaissance editor and writer Wallace Thurman, "[i]t has been said that he wrote blonde Peggy Hopkins Joyce's, 'Men, Women and Checks'" (13). By the time this article appears again, this time in Hughes' celebrated memoir, *The Big Sea*, which also appeared in 1940, the text had been revised to read, "[i]n fact, this quite dark young Negro is said to have written *Men, Women and Checks*" (234). By leaving out the name of Peggy Hopkins Joyce in the book version, Hughes further obscures the referenced text itself, as Peggy Hopkins Joyce's memoir was actually called, *Men, Marriage and Me*, thus making it easy to dismiss the claim when the book itself can not be easily identified. As it turns out, however, the implications for Wallace Thurman having written Peggy Hopkins Joyce's memoir, or having ghostwritten the memoir are fairly important, and if we can add this book to the canon of Harlem Renaissance productions, it adds another interesting aspect to the work and thought of the Harlem Renaissance writers. The

book, when viewed through the lens of Thurman's pen, becomes a biting satire of American consumer and celebrity culture, which was just coming into its own, with Peggy Hopkins Joyce as the first example of a celebrity being famous for no particular skill other than being a well-known socialite and tabloid celebrity.

Who Was Peggy Hopkins Joyce?

Peggy Hopkins Joyce is not very well-known today, but in the 1920s and 1930s, her name would have been known throughout almost every household in the United States. Peggy Hopkins Joyce's biographer, Constance Rosenblum writes,

> [s]he made headlines not because she triumphed on the silver screen like Mary Pickford, or flew across the Atlantic alone like Amelia Earhart, or swam the English Channel like Gertrude Ederle, or helped precipitate a constitutional crisis like Wallis Warfield Simpson, or stood at the center of a sensational crime like Evelyn Nesbit, or nestled under the wing of a powerful media baron like Marion Davies, or was anointed debutante of the year like Brenda Frazier. She did nothing of significance except collect and discard rich husbands in rapid succession in an age when such behavior was severely frowned on. The husbands themselves were nothing special; what little fame they accrued came solely from having their names linked with hers.
>
> In lieu of real accomplishments, however, Peggy had something far more important, the almost undivided attention of the newly powerful mass media, and over a remarkably long period. Her entrance onto the national stage was providential: she appeared just as the tabloid newspaper was poised to reshape American society, and the two had a perfect symbiotic relationship. She made a name for herself simply because they put her name in the papers; she was blasted into public prominence entirely by way of the screaming headline, the grainy tabloid photo, the frantic, dot-dot-dot item in the gossip column. She was a product of technology; she and Jazz Age journalism were born for each other, and they used each other shamelessly and with equal abandon." (*Gold Digger* 4-5)

This long introduction to Peggy Hopkins Joyce is to give a sense of the time in which she lived, and her relationship to those times, especially as her presence presaged a new development in American pop culture, and American consumer culture. The kind of flamboyant excess she represented, as the original "Gold Digger of Broadway," spoke volumes not only to the changing relationship women had to the culture, but also to the culture itself, and the culture's relationship with wealth, celebrity, journalism and entertainment.

For example, as a figure of female empowerment, Harlem Renaissance luminary Zora Neale Hurston seems to have seen something of interest in the rise of Peggy Hopkins Joyce. In her essay, "How it Feels to be Colored Me," Hurston writes, "Peggy Hopkins Joyce on the Boule Mich with her gorgeous raiment, stately carriage, knees knocking together in a most aristocratic manner, has nothing on me. The cosmic Zora emerges. I belong to no race nor time. I am the eternal feminine with its string of beads" (216). Peggy Hopkins Joyce also makes an appearance in Bruce Nugent's story, "Smoke, Lilies and Jade," in which she is spotted at a jazz club, Forno's,: "oh her cousin was with them and Peggy

Joyce… everyone came to Forno's…" (38). So, Peggy Hopkins Joyce certainly had captured the imagination of not just mainstream America, but also the relatively avant-garde younger writers of the Harlem Renaissance as well. Concerned as they were with critiquing contemporary society, it should come as no surprise that the writers of the Harlem Renaissance took the time to comment on such aspects of American society as celebrity culture, especially given the developing relationship white American pop culture had to African American folk culture during the so-called Jazz-Era.

Peggy Hopkins Joyce's memoir *Men, Marriage and Me* appeared in 1930. That it was ghostwritten was never much in doubt.[1] The question that arises then is: who ghostwrote the text? Rosenblum writes in her biography of Peggy Hopkins Joyce, "[i]n 1929, the New York firm of Macaulay and Company contracted with Basil Woon, an English journalist and travel writer with a flair for waxing poetic about the sophisticates of Hollywood and Europe, to help Peggy tell her story" (206). Thus, it would seem that Basil Woon was the ghostwriter for Hopkins Joyce's memoirs, especially as Rosenblum suggests that he would also later be contracted to ghostwrite her second book (*Gold Digger* 213). However, it appears that Basil Woon did not actually ghostwrite the second book when one checks the records of Macauley, the publisher. There one finds that *Transatlantic Wife*, Peggy Hopkins Joyce's second book (a novel this time), was ghostwritten by Maurice Dekobra, a prolific French novelist from the 1920s and 1930s (Macauley Special Records, https://library.osu.edu/)[2]. Thus, the question as to whether Woon ghostwrote *Men, Marriage and Me* is an open question.

In order to investigate the issue, I wrote to Rosenblum, to see if she had obtained official information unambiguously declaring Woon to be the ghostwriter of the memoir. Rosenblum kindly wrote me back with the following message:

> In my research, which was now a long time ago, I don't recall ever having come across a Wallace Thurman, and my knowledge about Basil Woon's role came, as I remember, from newspapers articles and reviews of the book. I also suspect that since publishing was a far more casual affair back then, there weren't many contracts floating about, and those that existed were casual affairs – especially for inconseqential works such as Peggy's "memoirs" – in any case, I never saw one. (Personal correspondence)

This leaves the question open: was Basil Woon really the ghostwriter of Peggy Hopkins Joyce's memoirs, or was it Wallace Thurman, as Langston Hughes

1 Peggy Hopkins Joyce claims in the *Brooklyn Daily Eagle* that she wrote the book herself – that it is indeed her diary, written faithfully since she was fifteen years old; although she admits that there is fiction in the manuscript as well (19). However, as the reviewer in the article hints at, most celebrity memoirs were ghostwritten at the time, and Peggy Hopkins Joyce's would have been no exception. There is also the additional issue of the voice of the unidentified editor in the memoir, who comments throughout at the beginning of some of the chapters on Peggy Hopkins Joyce's development, and guides the reader's interpretation of the text, giving the book the stylized feel of a self-consciously written narrative, and not the haphazard diary it purports to be.

2 This reference probably would not have been available to Rosenblum in 2000 when she was writing her biography.

suggests? Since the paper trail apparently ends here, I only had two means of going forward with the inquiry: one was to do a digital analysis of the text, and attempt to determine if the style matched up with Thurman or Woon's style, and the second would be to do a traditional analysis of the text, and try to determine from stylistic and thematic preoccupations, if the author of the text could be ascertained. The remainder of this paper will track the results of each of these approaches.

A Digital Analysis of the Text: The Corpus

Analyzing the text digitally presented several challenges. The first was procuring a digital copy of the text. The book is out-of-print, and certainly no e-book of the text exists. That meant that I had to purchase a facsimile copy of the book from an online distributor, scan the book in, and then correct the OCR. This time-consuming process was just the first in a series of steps needed to analyze the text. In order to get a good sense of how the book's style stood in comparison to other books of the era, I assembled a corpus of forty-two additional texts, all published between the years 1920 and 1940 (taking into consideration the 1930 publication date of *Men, Marriage and Me*)[3]. One of those forty-two texts was, of necessity, *Gentlemen Prefer Blondes* by Anita Loos, published in 1925. This is because both Constance Rosenblum (*Gold Digger* 155) and Loos scholar Cari Beauchamp (46) suggest that the character Lorelei Lee in *Gentlemen Prefer Blondes* was modeled after Peggy Hopkins Joyce. I have also included the sequel to *Gentlemen Prefer Blondes* as an additional control, a novel called *But Gentlemen Marry Brunettes*, which was published two years later, in 1927. One additional text I would have liked to include in the study, but was unable to obtain the digital text for was *Transatlantic Wife*, Hopkins' second book, although the authorship of that book cannot really be said to be in dispute given the Macauley records.

I have also used three books by Basil Woon as a control, *Arizona's Yesterday*, a memoir co-written with John Henry Cady, the memoirist; Woon's best-known book, another memoir written in tandem with the memoirist, *Sarah Bernhardt as I Knew Her: The Memoirs of Madame Pierre Berton as Told to Basil Woon*; and Woon's own account of his experiences in Cuba, *When It's Cocktail Time in Cuba*. One problem that arose from choosing texts by Woon is that he did not write novels, at least not in his own name. Thus, I chose three books that seemed to be in the spirit of the enterprise: one book I chose by him falls outside the year range, as it was published in 1915, but has the benefit of being the memoirs of John H. Cady as rewritten by Basil Woon, giving us a concrete demonstration of how Woon would have "ghostwritten" a memoir; the second book, Madame Pierre Berton's memoirs of Sarah Bernhardt, fulfills a similar function. The third book I selected by him, *When It's Cocktail Time in Cuba* is a memoir of sorts of his own experiences traveling through Cuba. Thus, these three books, while not novels, are memoirs and seem to fit the spirit of the project.

3 With the one exception of Basil Woon's 1915 *Arizona's Yesterday* co-written with John Henry Cady.

I used the two novels Wallace Thurman wrote as well[4]. The other novels in the corpus come from classic works of fiction by Harlem Renaissance luminaries, classic "jazz-age" authors, and books that appeared on bestseller lists during those twenty years. The resultant corpus is thus diverse in terms of race, gender and age. Furthermore, I have included two actual memoirs in the corpus, *The Autobiography of Margot Asquith*, and Edward Bok's Pulitzer Prize winning, *The Americanization of Edward Bok*, to make a control for genre, and make sure that the format of *Men, Marriage and Me* wasn't interfering with the accuracy of the results. However, due to the fact that the book was ghostwritten, and that Peggy Hopkins Joyce described it as a work of both fiction and fact, pairing it for the most part with novels seemed to be the sensible approach.

I have also included two texts by Maurice Dekobra, the ghostwriter of *Transatlantic Wife,* Peggy Hopkins Joyce's second book. This in itself presented a few challenges. The reason for this is that Macauley, the publishing house that published *Men, Marriage and Me* as well as Dekobra's English language books, was both a French and English-language publisher, and it appears that *Transatlantic Wife*, Peggy Hopkins Joyce's second book, was ghostwritten by Dekobra in French, and then translated by an unnamed party into English (Macauley Special Records, https://library.osu.edu/). Thus, when deciding which texts by Dekobra to choose, I decided to choose two texts by a translator who had been translating Dekobra's French language novels into English for Macauley around the exact same years *Transatlantic Wife* appeared, Metcalfe Wood. A full list of the books that appear in the corpus can be found as an appendix to this article.

A Digital Analysis of the Text: Method

The next question that arose was which method to use when digitally analyzing the corpus in order to determine author attribution. This required me to look into author attribution software currently in use in the field of Digital Humanities. Digital Humanities is a field of research that is interested in new means of examining texts that go beyond "close reading," instead doing a style of textual analysis known as "distant reading" (Moretti) or "macroanalysis" (Jockers). This type of analysis involves taking large numbers of texts – in this case, what I have identified as my corpus of forty-three books – and scanning the texts digitally, in order to pinpoint similarities of style between texts in the corpus. Two recent cases of author attribution have gained considerable international attention because of the high profile of the authors and works with which they were concerned. The first of these cases involved a novel called *The Cuckoo's Calling*, ostensibly written by someone named Robert Galbraithe, and published in 2013. It was later revealed that J.K. Rowling, who famously wrote the Harry Potter, series was the actual author of the novel. This fact was determined by the work of researchers Peter Millican of Oxford University and Patrick Juola of Duquesne University, who analyzed the text using an approach known as "linguistic stylometry." As Joula writes: "The

4 Thurman co-wrote a third novel, *The Interne*, however this book I have not included, being a co-written novel, and not a memoir, as in the case of the co-written books by Woon.

basic theory [of stylometry] is pretty simple: language is a set of choices, and speakers and writers tend to fall into habitual, or at least common, choices … But what we do know is that much of this apparently free variation is actually rather static at least at an individual level. So by studying examples of documents a person has written, we can build a model of the kind of choices that person makes" (https://languagelog.ldc.upenn.edu).

The second high profile case involved a 2015 study of *To Kill a Mockingbird* and *Go Set a Watchman*, conducted by Jan Rybicki and Maciej Eder. This analysis set out to settle the dispute as to whether or not Harper Lee had written the novel *Go Set a Watchmen*, the controversial novel which was published earlier that year. In their final analysis they determined that the novel had indeed been written by Harper Lee (https://www.wsj.com). This analysis also used stylometry. For this reason, I decided to use the same methodological approach as these two high-profile and highly successful and influential examples.

When using R, the stylometric software used in these two previous cases, one has to set parameters for analysis. Perhaps the most important of those is the search for Most Frequent Words (MFW), as this is highly indicative of style (Joula). This I set at the parameters of 100-3000, with increments of 50 for what is known as a Bootstrap Consensus Tree (BCT) (See Figure 1). I used this setting because it follows those used by the researchers in the previous high-profile cases, is the default setting for the program, and thus seemed to be a logical approach for a standard author attribution analysis, as I had no reason to alter these defaults specific to my analysis. The resulting BCT can be seen in Figure 1.

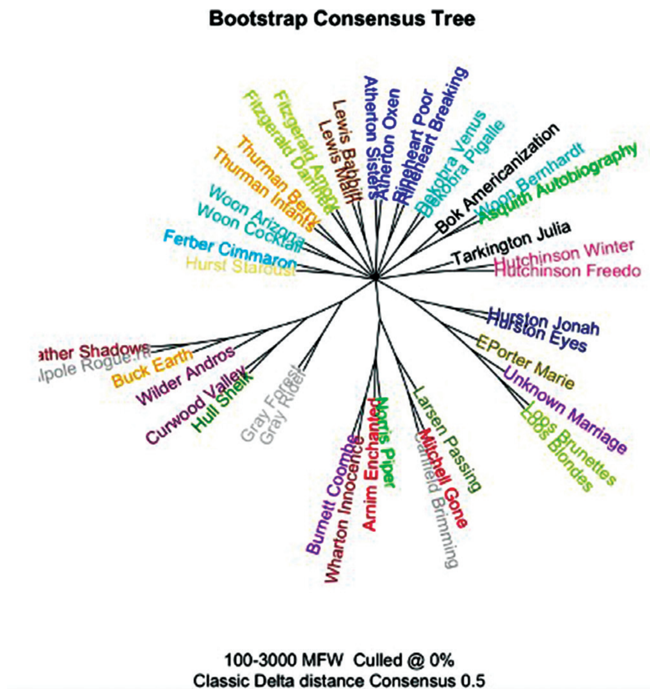


Figure 1: Bootstrap Consensus Tree analysis of corpus.

One sees that *Men, Marriage and Me* ("Unknown Marriage") pairs with Anita Loos *Gentlemen Prefer Blondes* (Loos_Blondes) as well as with *But Gentlemen Marry Brunettes* (Loos_Brunettes), but does not pair with either Thurman or Woon.

Thus I conducted another test, known as a Cluster Analysis (CA), which shows a hierarchical analysis of the most frequently used words. I ran two CA's,: one analyzing the hundred most frequent words used, as well as one analyzing the 1,500 most frequent words. They returned similar results (see Figures 2 and 3).

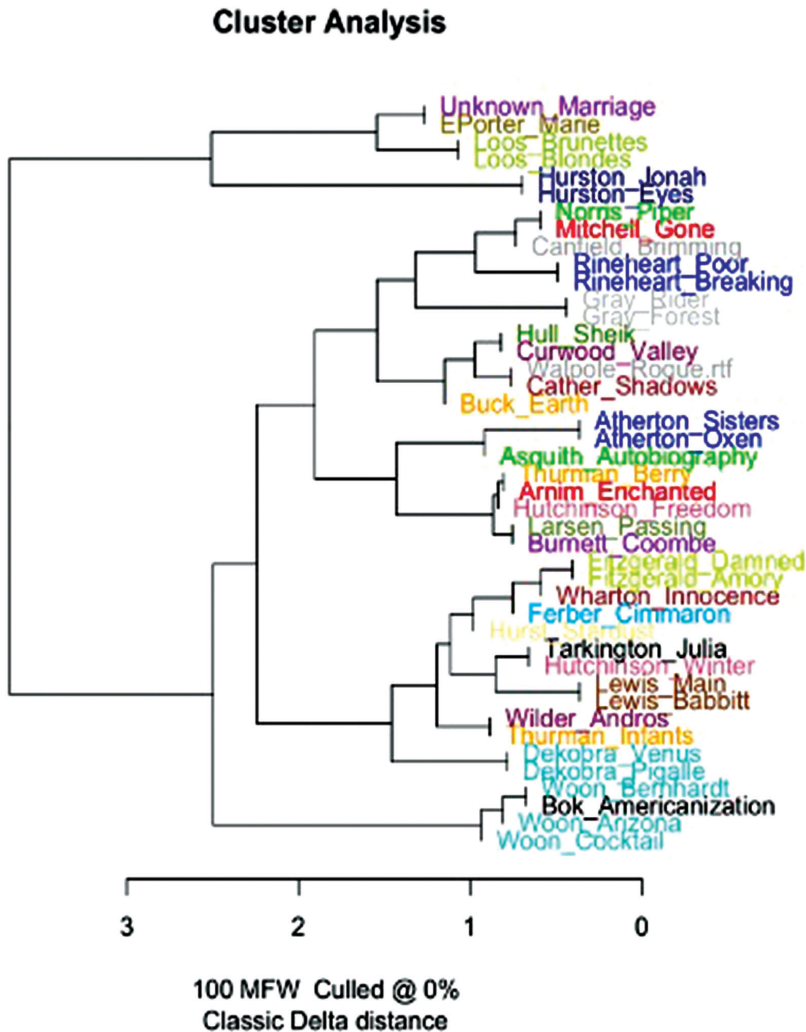


Figure 2: Cluster Analysis of corpus at 100 MFW

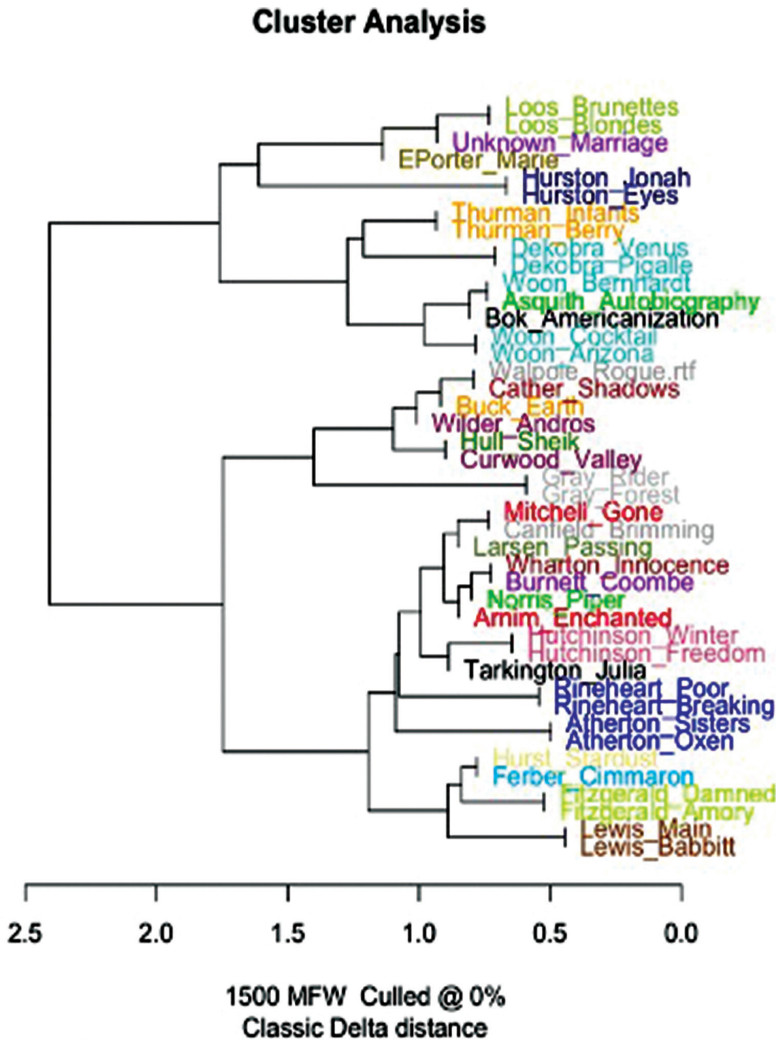


Figure 3: Cluster Analysis of corpus at 1500 MFW

The controls seem to work well, especially with the CA set to 1,500 MFW, as most authors' books are paired reliably together. For our purposes, there is nothing here to suggest that either Woon or Thurman wrote Peggy Hopkins Joyce's memoirs; indeed, the evidence strongly seems to suggest that Anita Loos ghostwrote the memoir herself! It is useful to remember that Anita Loos' Lorelei Lei in *Gentlemen Prefer Blondes* was widely considered to be based on Peggy Hopkins Joyce. Thus the evidence here points to one of two possible conclusions: either Anita Loos ghostwrote Peggy Hopkins Joyce's memoirs herself, or whoever ghostwrote the memoirs did so in a manner intended to mimic Anita Loos' *Gentlemen Prefer Blondes*, and was wildly successful in the venture.

Anita Loos as Author of Peggy Hopkins Joyce's Memoirs

The first area of investigation has to start with Anita Loos, since the digital analysis strongly suggests that she is indeed the author of *Men, Marriage and Me*. It is my contention that it is highly unlikely that Anita Loos would have ghostwritten Peggy Hopkins Joyce's memoirs. The first reason for this is that Anita Loos simply did not think much of Peggy Hopkins Joyce. Constance Rosenblum writes of Anita Loos, "in her opinion Peggy ranked as the most shameless of such kept women. The acid-tongued Loos liked to point out that Peggy enjoyed a brief stint as the mistress of Hollywood producer Joe Schenck before he settled down with the actress Norma Talmadge and began his climb to the top of Twentieth Century-Fox" (*Gold Digger* 60-61).

Secondly, in 1929, when *Men, Marriage and Me* would have most likely been written, Anita Loos was traveling, first in New York and Palm Beach, and later in London and Paris, a period which she would refer to later as her "wasted years" (Carey 133-134). It seems unlikely that she would have been engaged with the ghostwriting of Peggy Hopkins Joyce's memoirs during this period, especially considering the 1928 release of the film version of *Gentlemen Prefer Blondes*, and the financial success that would have brought her.

Finally, there is nothing on record to show that Loos had any association with Macauley Publishing Company – she appears in none of their contract papers, she never published with them and she was never known to be associated with them in any way. Loos' publisher during these years was Boni & Liveright, and Loos ghostwriting a book for Peggy Hopkins Joyce for Macauley in the years directly following her publication of *Gentlemen Prefer Blondes* (especially considering the fact that it had become a major motion picture in 1928, starring Marilyn Monroe) would most likely have violated contractual agreements, not to mention basic norms of decency in author-publisher relations. Thus, I again maintain that it is highly unlikely that Anita Loos, never known to be a ghostwriter to any degree, ghostwrote Peggy Hopkins Joyce's memoirs.

Basil Woon as Author of Peggy Hopkins Joyce's Memoirs

As we have noted, Basil Woon was also a possible ghostwriter for Peggy Hopkins Joyce. While it is fair to say based on the Macauley Publishing Company papers that Basil Woon did not ghostwrite *Transatlantic Wife*, the question of *Men, Marriage and Me* is still open. As we have also noted, Peggy Hopkins Joyce's biographer, Constance Rosenblum did not have any definitive evidence that Basil Woon was the ghostwriter. However, since it seems that he has been named by some as a ghostwriter, and as he did ghostwrite books for other authors, it is best to take the suggestion seriously.

The first suggestion that Woon may have ghostwritten the memoirs comes from Basil Woon's obituary in the *New York Times*. Here we find written,: "He also had been a correspondent in Paris, a publicity man for Cuba and a ghost writer for Peggy Hopkins Joyce" ("Basil Woon" nytimes.com). The article does not specify

what he may have ghostwritten, or when. Is his ghostwriting limited to the weekly "How to Get Your Man" columns that Peggy Hopkins Joyce published in the *Evening Graphic*, or did they extend beyond that? Indeed, what evidence is there that Woon ghostwrote anything for Peggy Hopkins Joyce at all? The New York Times does not list any sources. The only other hint that Basil Woon might have ghostwritten the book one finds in the *Brooklyn Daily Eagle*, from Monday, February 17, 1930. Here one reads in the gossip column, "The Week of a New Yorker" the following: "To make another attempt at Peggy Hopkins Joyce's 'Men, Marriage and Me,' which one would have to resort to pig latin [sic] to describe and to give it up as all hooey and a yard thick, wondering if there was any truth in the rumor that the tome was ghost-written by Basil Woon" (21). This is to say that there was certainly rumor and hearsay that Basil Woon was the ghostwriter, but how much authority we can attribute to this humorous gossip column is a question worth asking.

Included in the corpus there are two books by Woon that are acknowledged to be "ghostwritten" (or more accurately, co-written) by him: one by John Cady, and the other by Madame Pierre Berton, and her recollections of Sarah Bernhardt (perhaps Woon's most famous book). Both of these books line up nicely with Woon's own personal account of his life in Cuba in the digital analysis, and yet Woon's books appear to have nothing to do with Peggy Hopkins Joyce's book. Furthermore, there is no mention that Woon had any connection to Macauley as a publisher anywhere except in Rosenbaum's book. Indeed, Woon's memoirs of Cuba are published by Boni & Liveright, Anita Loo's publisher. Thus, given the lack of connection between Macauley and Woon, and given the fact that other books "ghostwritten" by Woon smack of his individual style (according to the digital analysis), it seems unlikely that Woon was the writer of Peggy Hopkins Joyce's memoirs. The more likely explanation is that this rumor, having been first reported in the press, was subsequently taken as fact.

Making the Case for Wallace Thurman as Author of Peggy Hopkins Joyce's Memoirs

This leaves the final possibility: namely that Wallace Thurman, whom Thurman's friend and colleague Langston Hughes claimed was the actual ghostwriter of *Men, Marriage and Me*, did indeed write the memoirs. From a glance at the digital analysis, this would seem to be unlikely. While Thurman is positioned closer to *Men, Marriage and Me* than Woon's texts are in the 1500 MFW Cluster Analysis (Fig. 3), the proximity is not enough to be conclusive. In fact, the only books that are consistently paired with *Men, Marriage and Me* are Anita Loos' two novels; so once again we have to accept that either Loos wrote the book herself, which (as has been determined), is unlikely, or it will be necessary to look at other aspects of the text that might give clues as to who the true author might have been.

The biggest obvious difference between Thurman and the other two authors offered here as possible ghostwriters is the relationship the authors had with the publisher of Peggy Hopkins Joyce's memoir, Macaulay. All three of Wallace Thurman's novels were published by the Macaulay Company: *The Blacker the*

Berry in 1929, *Infants of the Spring* in 1932 and *The Interne*, written with A.L. Furman ("a lawyer and family member of one of the Macaulay publishers" [van Notten 254]) in 1932. Furthermore, Thurman did not just publish with Macaulay, he played (surprisingly enough for an African American at this time) an important editorial role as well. As Thurman biographer Eleonore van Notten writes, "[i]n September 1932 an announcement appeared in *The Crisis* reporting that Thurman had been appointed editor-in-chief of the Macaulay Company following his recent publication of *The Interne*" (295). Prior to that Thurman had worked as a reader at the company, although the details of his duties are not exactly clear. As van Notten writes, "[f]ew records remain to document Thurman's activities at the Macaulay Company. From Dorothy West's account it would appear that Thurman's work centered mainly on the publication of 'popular fiction.' West explains that Thurman's experience at *True Story* magazine made him eminently suitable for this position" (296). This reference to *True Story* magazine draws us deeper into the mystery. As early as 1928 Wallace Thurman was ghostwriting stories for *True Story* magazine through Macfadden Publishing (Singh xviii). *True Story* was a magazine that published sensationalistic true-life stories (or so they were purported to be in any case). It is reasonable to assume that at some point in 1929, while Thurman was working out the details of publishing his first novel with Macaulay, that he established a deal with the publisher to ghostwrite Peggy Hopkins Joyce's sensationalist true-story memoir as well. It would, in fact, have been right in line with the editorial work he was already doing.

The case for Wallace Thurman becomes even stronger when one looks at the text of Peggy Hopkins Joyce's memoir itself. The book is certainly written as a satire, regardless who wrote it, and much of the wit of the book comes from the intentional dramatic irony established between what the reader understands and what the author of the diary relates. This is especially true in the early parts of the book when Hopkins Joyce is still young and naïve. One sees this even in the chapter titles; for example, chapter two is titled, "I became a Wife – For Two Days," which of course is meant to elicit a chuckle from the reader who knows Peggy Hopkins Joyce to have been married numerous times to various wealthy men. The marriage runs into problems when her husband attempts to consummate their relationship: "He said, dear, that is an experience every wife has to go through, you are just young that is all and when you think it over you will know that I love you and you will come back to me" (30). Peggy swears off men altogether, but of course within a few chapters she is married again, this time to Sherburne P. Hopkins, another millionaire. "After all Sherby is a Millionaire and very prominent socially and a girl cannot marry a Millionaire who is prominent socially every day" (51). By chapter seven, she leaves Sherburne, after having established herself in society: "I did not take his presents with me when I left, except the wrist-watch which I needed. I put them on the dressing-table where he could see them and I took only eight dollars in cash because I would not ask him for money to leave him with, and I only took a few of my dresses, just one suitcase" (71). This approach to satire is exactly the type of "Modernist Burlesque" that Dickson-Carr reveals to be central to many of the Harlem Renaissance writers' approach to satire:

> Schuyler, Thurman, Hurston, Fisher, Nugent, and others engage in what Sonnet Retman calls "modernist burlesque, a kind of satire that occupies its subject from the outside in by pushing its most theatrical and technological elements to spectacular excess." Modernist burlesque seeks to "dismantle the authentic aura" surrounding the folk or the masses, to question whether authenticity of any sort resides only in the imagination, thriving in cultural arbiters more concerned with controlling or speaking for the folk and their cultural products rather than allowing them to speak. Modernist burlesque is perhaps akin to reductio ad absurdum, the rhetorical technique central to countless satires. Reductio ad absurdum—reduction to the absurd—takes a particular figure or institution's most emblematically lamentable qualities, discards nuances and complexities, and reveals the falsehoods, exaggerations, and puffery at the heart of the satiric target. (18-19)

This is the exact approach to satire taken in Peggy Hopkins Joyce's memoir. It takes the character of Peggy Hopkins Joyce, and through a distinct lack of nuance and complexity, reveals through dramatic irony how profoundly shallow and materialistic her worldview is.

Another interesting aspect of Peggy Hopkins Joyce's memoir is that, while written like a series of diary entries, these entries are interspersed with commentary from the editor, who is almost certainly the same person as the ghostwriter, given the narrative symbiosis between what the editor announces is to come, and the text that follows. Moroever, the editor doesn't comment on Peggy Hopkins Joyce's absurdities, or the obviously intentional ironies in the text. On the contrary, the editor plays the role of something like stage manager, adding narrative where narrative is missing, and takes her account completely at face value. For example, at the start of chapter four, the chapter in which she meets Sherburne, the editor begins the chapter with the following commentary: "*Note also the influence her experience and her two months' schooling have had on the young girl's writing. Through the inconsequential phraseology of the child we begin to discern the tremulous, uncertain, at times chaotic reasoning of adolescence*" (35).

This commentary follows Peggy Hopkins Joyce throughout the book, and provides a meta-narrative in which Peggy Hopkins Joyce undergoes something of a spiritual transformation that occurs despite the fact that she has spent the entire book in pursuit of material goods through marriage. This is most evident in chapter twenty-four, when she goes through with her divorce from Stanley Joyce, the man who gives her her last name. In this chapter we find the following passage:

> It's time to be honest with myself. I expect I have always found it hard to be honest with myself. Most people do.
>
> I'm not sure that I'm any more selfish than other people, really. When you come to figure people out everybody is after happiness and the thing that will give them the most satisfaction. Even people who are known as being very unselfish are that way because they have learned that it makes them happier to be. So after all they are really selfish too – giving things to people and doing things for them because they find the most happiness that way. (189)

This sounds very much like a reiteration of ideas expressed by Nietzsche, in particular Nietzsche's immoralist, who stands beyond good and evil. This is important because Wallace Thurman considered himself to be a "confirmed Nietzschean" (Thurman, *Collected Writings* 235). Nietzsche writes:

> *We immoralists!*.-This world with which *we* are concerned, in which we have to fear and love, this almost invisible, inaudible world of delicate command and delicate obedience, a world of "almost" in every respect, captious, insidious, sharp, and tender – yes, it is well protected from clumsy spectators and familiar curiosity! We are woven into a strong net and garment of duties, and *cannot* disengage ourselves – precisely here, we are "men of duty," even we! Occasionally, it is true, we dance in our "chains" and betwixt our "swords"; it is none the less true that more often we gnash our teeth under the circumstances, and are impatient at the secret hardship of our lot. But do what we will, fools and appearances say of us: "These are men *without* duty," – we have always fools and appearances against us! (152)

Or, to put it a way that would have been very familiar to Thurman, whose introduction to Nietzsche almost certainly came from his reading of Mencken[5]:

> Nietzsche called himself an immoralist. He believed that all progress depended upon the truth and that the truth could not prevail while men yet enmeshed themselves in a web of gratuitous and senseless laws fashioned by their own hands. He was fond of picturing the ideal immoralist as "a magnificent blond beast" – innocent of "virtue" and "sin" and knowing only "good" and "bad." Instead of a god to guide him, with commandments and the fear of hell, this immoralist would have his own instincts and intelligence. Instead of doing a given thing because the church called it a virtue or the current moral code required it, he would do it because he knew that it would benefit him or his descendants after him. Instead of refraining from a given action because the church denounced it as a sin and the law as a crime, he would avoid it only if he were convinced that the action itself, or its consequences, might work him or his an injury. (Mencken 96-97)

Throughout the course of the book, then, the reader sees Peggy Hopkins Joyce's development from a naïf to a powerful immoralist herself; she has in fact always been this immoralist, she was just not cognizant of the fact until she developed sufficient knowledge of herself (although, as we will see, that knowledge does not go far enough). Thus, at the start of chapter thirty we find the editor writing:

> From now on the careful reader will notice a subtle difference in the writings of Peggy in her famous Diary. She is less naïve, less ingenuous, less revealing. This is because she has already contracted for publication of the Diary. She is writing for publication – a vastly different thing than writing for oneself alone.

5 It is also likely that Thurman read Nietzsche himself in translation. To that end, my Nietzsche translation comes from the 1917 Helen Zimmern translation, which would have been available to Thurman.

> Nevertheless, it is in the chapter to follow that some of the most astonishing revelations of Peggy's soul are made. Her comments upon men and life in general constitute a philosophical addition to contemporary satire. Her epigrams become more rounded, but are none the less apt and original.
>
> Peggy as an "author" almost outshines Peggy as Diarist. (233)

This preface is to a chapter in which Peggy Hopkins Joyce is now able to rewrite ten rules given to her early on in the book by model Fanny Brice, and rewrite them in a wittier way; rhe chapter introduces the reader to a much more mature Peggy Hopkins Joyce – one need not be a "careful reader" at all to notice it. The transformation is, in this chapter, complete. Peggy Hopkins Joyce more or less lays out a philosophy of love which is full of witticisms and epigrammatic sayings that are characteristic of the fast-talking, snappy dialogue endemic to the flapper-stereotype: "Some women use all their energy in keeping a husband's good will by flattering him and making him think what a great man he is. This may keep him your husband but it will not keep him your lover"; or "You show me a man with his stomach full of his wife's good cooking and his slippers on the rug and his pipe in his mouth and his newspaper in his hand while his wife sits by sewing, and I will show you a man who is too happy to be in love" (234-235).

Peggy's new cynical flapper philosophy, where she views love as sport in the manner of Hemingway's Lady Brett Ashley, makes her transformation impressive, and yet the satire remains biting until the end. The interjection by the editor at the beginning of chapter thirty, where he remarks on the development and maturation of Peggy Hopkins Joyce is the last we hear from him. Once again, the reader is left with dramatic irony that continues to satirize the emptiness of the materialistic life, despite Peggy's maturation. The final chapters see Peggy courted by a wealthy Italian suitor who turns out to be married, and so the affair ends with her being abandoned and humiliated.

Finally, the book ends with her having met someone new. She writes:

> After all that's one of the nice things about life. That no matter how many times you have been disappointed when something nice begins to happen you can have just as much fun expecting.
>
> Perhaps that's childish, but if it is I don't want ever to grow up. Maybe I'm kidding myself a little, but what of it? It's such fun.
>
> I got up this morning, wondering, "Will he call me? Won't he call me?"
>
> That's the sort of thing that makes getting up in the morning worth while. (285-286)

It's a bleak ending, where Peggy Hopkins Joyce has actually not learned anything: Because she hasn't really come to examine her own motivations, she continues to be stuck in her normal patterns of behavior, and any maturation she has done is lost to the fact that she hasn't confronted the fundamental issue that drives her, namely, her empty materialism. For Thurman, true self-knowledge was an essential component of "the will to power." Thurman writes in his own "objective" third-person autobiography, "Notes on a Stepchild:"

> He believes it is the duty of those who have the will to power in artistic and intellectual fields to shake off psychological shackles, deliberately formulate an egoistic philosophy, develop a cosmopolitan perspective, and soar where they may, blaming only themselves if they fail to reach their goal. Individual salvation may prove a more efficacious emancipating agent for his generation and for those following than self-sacrifice or morbid resentment.
>
> There has been in the past far too little of the former and far too much of the latter. The Negro has been so busy bemoaning his fate, so busy placing the entire responsibility for his failures on Marse George that he has not yet stopped to take stock of himself. This volume pretends to be a step in that direction. (234)

Thurman's "egoistic philosophy" requires a knowledge-of-self that Peggy Hopkins Joyce doesn't achieve by the end of her memoir, and so what she perceives as a happy ending to her memoir, the reader perceives as deeply sad. Thurman's *Modernist Burlesque* is complete.

Conclusion

The conclusion to this study seems to be multiple, and somewhat unexpected. Based on the digital analyses of Peggy Hopkins Joyce's memoir, is no reason to believe Basil Woon had anything to do with their composition; on the contrary, every analysis performed on the text in combination with Anita Loos' *Gentlemen Prefer Blondes* and *But Gentlemen Marry Brunettes* returns the some result: that Joyce's memoir was written by Anita Loos. This means the book was either written by Anita Loos (which given the circumstances was highly unlikely), or that the writer of Peggy Hopkins Joyce's memoir aped Anita Loos' style to such a degree that it is able to mislead stylometric software. There is also, of course, the possibility that Peggy Hopkins Joyce wrote the book herself, and in doing so, mimicked the style Anita Loos used to mimic her. This raises the interesting question, beyond the scope of this study, as to how stylometric analysis manages texts that are meant to disguise their author intentionally, or to ape another author's style intentionally.

The inconclusiveness of the digital analysis required me to look at other possibilities for analyzing author attribution. To my mind, the most likely candidate is Wallace Thurman; moreover, a reading of the text as a work of satire in the style of Modernist Burlesque, one frequently used by Harlem Renaissance satirists, of which Thurman was one of the most prominent, brings fruitful results. A neglected book of celebrity gossip and fluff reveals unexpected literary and philosophic subtleties when read as the work of someone coming from such a radically different economic, social, philosophical, artistic and racial perspective in the heady jazz age years of the 1920s.

Works Cited

"Basil Woon, 80, Journalist, Dies." The New York Times, June 5, 1974, p. 46.

"Macaulay Company Records." *Special Collections*. Ohio State University. https://library.osu.edu/collections/spec.rare.cms.0296/collection-inventory. Accessed May 5, 2020.

"The Week of a New Yorker." *The Brooklyn Daily Eagle*, Feb 17, 1930, vol. 90, no. 47, p. 21.

Beauchamp, Cari. "Hollywood Success and International Fame 1915-1930." *Anita Loos Rediscovered: Film Treatments and Fiction by Anita Loos, Creator of Gentlemen Prefer Blondes*. University of California Press, 2003, pp. 37-125.

Carey, Gary. *Anita Loos: A Biography*. Knopf, 1988.

Dickson-Carr, Darryl. *Spoofing the Modern: Satire in the Harlem Renaissance*. University of South Carolina Press, 2015.

Eder, Maciej, Jan Rybicki, and Mike Kestemont. Stylometry with R: A Package for Computational Text Analysis. *R Journal*, vol. 8, no. 1, pp. 107-121. https://journal.r-project.org/archive/2016/RJ-2016-007/index.html.

Gamerman, Ellen. "Data Miners Dig Into 'Go Set a Watchman.'" *Wall Street Journal*, July 16, 2015. https://www.wsj.com/articles/data-miners-dig-into-go-set-a-watchman-1437096631.

Hughes, Langston. "Harlem Literati in the Twenties." *Saturday Evening Review*, June 22, 1940, pp. 13-14.

___ . *The Big Sea*. Farrar, Strauss and Giroux, 1993.

Hurston, Zora Neale. "How It Feels to be Colored Me." *The World Tomorrow*, May 1928, pp. 215-216.

Jockers, Matthew L. *Macroanalysis: Digital Methods and Literary History*. University of Illinois Press, 2013.

Joula, Patrick. "Rowling and 'Galbraith': An Authorial Analysis." *Language Log*, University of Pennsylvania. https://languagelog.ldc.upenn.edu/nll/?p=5315.

Joyce, Peggy Hopkins. *Men, Marriage and Me*. The Macaulay Company, 1930.

Mencken, H.L. *The Philosophy of Friedrich Nietzsche*. Luce and Company, 1913.

Nietzsche, Friedrich. *Beyond Good and Evil*, translated by Helen Zimmern, The Modern Library, 1917.

Nugent, Richard Bruce. "Smoke, Lilies and Jade." *Fire!!,* vol. 1, no. 1, pp. 33-39.

Moretti, Franco. *Distant Reading*. Verso Books, 2005.

Rosenblum, Constance. "Personal Correspondence." Email, May 17, 2018.

___ . *Gold Digger: The Outrageous Life and Times of Peggy Hopkins Joyce*, Metropolitan Books, 2015.

Singh, Amritjit, and Daniel M. Scott III. "Chronology." *The Collected Writings of Wallace Thurman*. Rutgers University Press 2003, pp. xvii-xviii.

Thurman, Wallace. "Notes on a Stepchild." *The Collected Writings of Wallace Thurman*. Rutgers University Press 2003, pp. 235-240.

van Notten, Eleonore. *Wallace Thurman's Harlem Renaissance*. Rodopi, B.V., 1994.

Weer, William. "Peggy Hopkins Joyce Turns Author, Tells All in Book on Marriages." *Brooklyn Daily Eagle*, January 30, 1930, vol. 90, no. 29, p. 19.

APPENDIX A: CORPUS OF BOOKS

Arnim_Enchanted - *The Enchanted April*, Elizabeth von Anrim (1922)
Asquith_Autobiography – *The Autobiography of Margot Asquith*, Margot Asquith (1921)
Atherton_Oxen – *Black Oxen*, Gertude Atherton (1923)
Atherton_Sisters – *The Sisters-in-Law*, Gertrude Atherton (1921)
Buck_Earth – *The Good Earth*, Pearl S. Buck (1931)
Bok_Americanization – *The Americanization of Edward Bok*, Edward Bok (1923)
Burnett_Coombe – *The Head of the House of Coombe*, Frances Hodgson Burnett (1922)
Canfield_Brimming – *The Brimming Cup*, Dorothy Canfield (1921)
Cather_Shadows – *Shadows on the Rock*, Willa Cather (1931)
Curwood_Valley – *The Valley of Silent Men*, James Oliver Curwood (1920)
Dekobra_Pigalle – *Midnight on the Place Pigalle*, Maurice Dekobra (1932)
Dekobra_Venus – *Venus on Wheels*, Maurice Dekobra (1930)
EPorter_Marie – *Mary Marie*, Eleanor H. Porter (1920)
Ferber_Cimmaron – *Cimmaron*, Edna Ferber (1929)
Fitzgerald_Amory – *This Side of Paradise*, F Scott Fitzgerald (1920)
Fitzgerald_Damned, *The Beautiful and the Damned*, F. Scott Fitzgerald (1922)
Gray_Forest – *The Man of the Forest*, Zane Gray (1920)
Gray_Rider – *The Mysterious Rider*, Zane Gray (1921)
Hull_Sheik – *The Sheik*, E.M. Hull (1921)
Hurst_Stardust – *Stardust: A Story of an American Girl*, Fanny Hurst (1921)
Hurston_Eyes – *Their Eyes Were Watching God*, Zora Neale Hurston (1937)
Hurston_Jonah – *Jonah's Gourd Vine*, Zora Neale Hurston (1933)
Hutchinson_Freedom – *This Freedom*, A.S.M. Hutchinson (1922)
Hutchinson_Winter – *If Winter Comes*, A.S.M. Hutchinson (1921)
Larsen_Passing – *Passing*, Nella Larsen (1929)
Lewis_Babbitt – *Babbitt*, Sinclair Lewis (1922)
Lewis_Main – *Main Street*, Sinclair Lewis (1920)
Loos_Blondes – *Gentlemen Prefer Blondes*, Anita Loos (1925)
Loos_Brunettes – *But Gentlemen Marry Brunettes*, Anita Loos (1927)
Mitchell_Gone – *Gone with the Wind*, Margaret Mitchell (1936)
Norris_Piper – *Harriet and the Piper*, Kathleen Norris (1920)
Rineheart_Breaking – *The Breaking Point*, Mary Roberts Rineheart (1923)
Rineheart_Poor – *A Poor Wise Man*, Mary Roberts Rineheart (1920)
Tarkington_Julia – *Gentle Julia*, Booth Tarkington (1922)
Thurman_Berry – *The Blacker the Berry*, Wallace Thurman (1929)
Thurman_Infants – *Infants of the Spring*, Wallace Thurman (1932)
Unknown_Marriage – *Men Marriage and Me*, Peggy Hopkins Joyce (1930)
Walpole_Rogue – *Rogue Herries*, Hugh Walpole (1930)
Wharton_Innocence – *Age of Innocence*, Edith Wharton (1920)
Wilder_Andros – *The Woman of Andros*, Thornton Wilder (1930)
Woon_Arizona – *Arizona's Yesterday*, John Cady, rewritten by Basil Woon (1915)

Woon_Cocktail – *When It's Cocktail Time in Cuba*, Basil Woon (1928)
Woon_Bernhardt –*Sarah Bernhardt as I Knew Her: The Memoirs of Madame Pierre Berton as Told to Basil Woon*, Basil Woon (1923)

Anna Bendrat

Transitioning the Edges of Multiple Text Worlds: A Cognitive Processing Path from Textuality to Texture in Hanya Yanagihara's *A Little Life*

Abstract: The paper is located in the field of cognitive poetics and its general aim is to explore cognitive processes underlying the idiosyncrasy of a reader's narrative engagement on the level of *texture*. By introducing the notion of *texture,* Peter Stockwell (2009) added the third level of a reading experience, situated above *a text* (level 1) and *textuality* (level 2). While *textuality* present in *text*'s stylistic patterns is the "outcome of the workings of shared cognitive mechanics, evident in *texts* and readings," *texture* is defined as the "experienced quality of *textuality*" (Stockwell, *Texture - A Cognitive Aesthetics of Reading* 1). In other words, *texture* must involve a reader's aesthetic positioning, but it also "requires aesthetics to be *socially* situated" (Stockwell 191; emphasis added). The paper focuses on Hanya Yanagihara's novel *A Little Life* (2015) which has been selected due to its added complexity stemming from the fact that the chapters have alternating narrators. In the book a computational analysis is applied to the narratives of the three focalizers to trace and compare the positive and negative emotional valence of the texts with the use of R-environment software. It is argued that where intradiegetic perspectivizing entities (focalizers/narrators) are multiple, indicating and creating a mental representation of the main protagonist involves a particularly complex process. The protagonist's ontological existence inside the narrative situation blends with the reader's mental capacity for synthesis along the *edges* of the multiple narrative perspectivization.

Keywords: cognitive poetics, texture, Current Discourse Space, edgework, multiperspectivity, affect, R environment, text mining, sentiment analysis

> Readings consist of the interaction of texts and humans.
>
> Peter Stockwell

Introduction

"Why do we care about literary characters?", asks Blakey Vermeule in the title of his book about the ways the readers' literary experiences are affected by the emotional attachments they developed towards fictional characters. Vermeule looks for a cognitive explanation for our "imagining-under-guidance" only to find that humans are predisposed to thinking of other humans (23). To give it a psychological grounding, he quotes Leslie Brothers, a cognitive psychologist, who defines a *person* as "a higher level perception of bodies" which endows them with mental life. Our brains perceive a person automatically, which is an "obligatory part of our experience of others – and ourselves" (qtd. in Vermeule 23). If the same may be said of our perception of literary characters, this theory still does not explain how our perception evolves with the progress of the narrative.

In this paper an attempt will be made to conceptualize the process of creating a mental construct of the main protagonist of a 2015 novel *A Little Life*

through the story of his life and disability recounted by multiple narrators. In Hanya Yanagihara's novel there are three narrators who present Jude St Francis from their own intimate and subjective perspective. The reader's affective response to Jude's disability is cognitively filtered through two distinctive levels of narrative modes and responses: (1) intratextual – that of several narrators/focalizers who impose their own distinctive affective responses within the level of *text* and *textuality*, and (2) extratextual – that of the reader's cognitive blending of the textual input with its contextual and psychological modelling. The latter functions on the level of *texture*, as it depends on highly individualized scripts transforming affects into particular context-dependent emotional reactions. Stockwell defines *texture* in reference to the physical experience of touch on various surfaces:

> Texture, in everyday understanding, is the quality of feeling that is associated with different objects in the world. It is primarily a physical sense, with its main usage associated with fingertip touch and then the haptic system in general; secondarily, the notion of texture is transferred to the visual field, and then to the sense of taste; and lastly it is used in an abstract, conceptual sense. In cognitive poetics, which explores the interaction between readers and literary works, the definition of texture and its actual set of usages in the world is the starting point for an exploration of the ways in which stylistic patterns and readerly experience inter-animate each other ("Texture" 459).

In the light of the proposed methodological framework based on Peter Stockwell's model of *texture* as the experienced quality of *texts* and *textuality*, a computational study of the selected characters' emotional schemas will be applied to support the assumption that the emotional construal encoded on the level of *text* and *textuality* finds its direct projection onto the reader's narrative empathy on the level of *texture*. In the study it is assumed that the computational processing involves cognition in the sense implied in Stockwell's definition of *textuality* ["outcome of the workings of shared cognitive mechanics, evident in *texts* and readings"]. It will be argued that the processing of the characters' multiple viewpoints depends on the viewing position of the reader who moves across the *edges* of several text worlds, since "[t]he essence of *texture* is in the edges" (Stockwell, *Texture - A Cognitive Aesthetics of Reading* 107). The notion of *edges* is Stockwell's key observation, in which the author posits that a friction of two or more contrastive surfaces is necessary to create a "force" generating our perception of a change in perspectives:

> The literal end of the notion of texture should remind us that texture itself requires cognisance of two media or surfaces; . . . Friction between fingertip and object, or the deflection of one object upon contact with another, or damage to one object as a result of an encounter – all of these are examples of force produced by textural effects in the physical world. Furthermore, the interface between two textures (air and water, or air and land, for example) provides the opportunity for motion if both textures are engaged or crossed (by a sail and keel, for example, or by wheels and an engine). Texture, in other words, is fundamentally a contrastive phenomenon: we notice texture at all most often when we have crossed from a different texture, and it is the difference that forces us to notice the new textural quality ("Texture" 459).

The computational study of sentiments will be carried out on the extracted fragments of narratives of the three respective focalizers: Jude, Willem and Harold with the use of the *syuzhet* software package in R environment. The goal of the analysis is to assess the level of affective divergence between these characters. First, the differences in the emotionality of the respective focalizers' narratives will be measured computationally (the level of *text* and *textuality*). Next, the preliminary text-based reader's response analysis will be confronted with the aforementioned results of the computational study (the level of *texture*).

A Little Life as Metaffective Fiction: Multiperspectivity and Affect

Since the study aims to focus on the role of multiple narrators and their emotional profiling, a feasible question may be raised whether Yanagihara's novel possesses metaffective qualities, which constitute a prerequisite for such a design of the study. To begin with, the natures of the properties which make a novel metaffective need to be established. The issue must be examined on two levels: first, on the level of metafiction, and, second, on the level of affect as groundwork for emotion. To start with the metafictional quality of Yanagihara's novel, its own metafictional agency may not be attained directly, as, for instance, in Mark Z. Danielewski's *The House of Leaves,* but rather implicitly, through a technique of multiple narrators-focalizers whose accounts partially overlap as they often portray the same events. Due to the novel's narrative focus on multiperspective paradigm, combined with a third-person narration style, the reader oftentimes gets confused whose viewpoint is being presented at a given point in the narrative. Thus, through the interaction of the three narrative perspectives: that of the main character – Jude St Francis, his best friend and partner – Willem, and Jude's adoptive father – Harold, a semantic friction occurs and the resulting tension draws the reader's attention both to the presented object (Jude and his disability) and to the three varying viewpoints presenting this object. For narratologists, the friction and the tension on different epistemological levels constitute the condition and the essence of multiperspectivity (Hartner).

The notion of multiple perspectives presented in this article, however, relies on the theoretical framework of cognitive poetics. The concept finds its reflection in Peter Stockwell's model of reader's narrative engagement on the level of *texture* where the conceptual integration of the character construct takes place. Here it is argued that the main protagonist's emotional construct formed on the level of the novel's *text* and *textuality* as an amalgam of the three narrative perspectives is transposed to the higher level of *texture* where it evokes an empathetic response in the reader (see Sara Whiteley on 'appraisal theory' models of emotions which arise in the course of reading). Stockwell's concept of the conceptual blend occurring beyond the level of novel's *textuality* is traced back to Ronald W. Langacker's cognitive model of the Current Discourse Space.

Moving on to the affective elements in Yanagihara's novel, what needs to be addressed at the outset is the divergence in the literary critics' attitudes to the affective turn in post-postmodern literature. The first group of literary critics, such

as Stephen Burn, Robert McLaughlin and Mary Holland hail the optimistic "return to the real" aesthetics represented by such authors as David Foster Wallace, who commit to the literature which "values human connection, empathy, emotion, belief, and other directedness as correctives to the perceived narcissism, cynicism, solipsism, media saturation, and debilitating forms of cultural irony of the postmodern world" (qtd. in Clare 263). On the other end of the spectrum of contemporary literary criticism there are authors such as Rachel Greenwald Smith who confront the *affective hypothesis* on the practical grounds, claiming that affect, as anything else in the neoliberal era, has been commodified to suit the needs of an "entrepreneurial subject that is always managing individual or 'private emotions' like commodities and reducing human connections to [simply] networking" (qtd. in Clare 264). A third way has been proposed by Ralph Clare who calls our attention to the distinction between affect and emotion (263). In his definition of affect as "intensity", Clare refers to Brian Massumi's 2002 book titled *Parables for the Virtual: Movement, Affect, Sensation*.

However, what all the three perspectives on affect in recently published scholarship have in common is the underestimation of Silvan S. Tomkins classic psychological theory of behavioral patterns based on affective responses, which he called scripts. The distinction between biological affect progressing through the stages of the awareness of affect (=feeling) and the psychological scripts based on past experiences (=emotion) had already been explored in the two volumes of Tomkins' 1962 book called *Affect, Imagery, Consciousness*. In my view, the insufficient recognition of Tomkins' groundbreaking study of affects as primordial systems stimulating human motivation ultimately reduces the contemporary studies of affects to the post-millenial socially enforced adherence to compassion in the era of "cruel optimism" (Berlant). Tomkins's observation that when we are preoccupied, we ignore hunger, illustrates a subtle, yet fundamental distinction between affect system and drive system (13). Affect system acts as a primordial sensory feedback to the drive system operating on pleasure and pain signals, and, therefore, as a psychological mechanism, it is primary to biological drive. Tomkins observes that "[m]uch of the motivational power of the drive system is borrowed from the affect system, which is ordinarily activated concurrently as an amplifier for the drive signal" (13). Tomkins divided affects into positive and negative, and, accordingly, referred to them as "primarily aesthetic experiences" (12). To say that the "organism is so constructed that the pleasure of eating is more acceptable than the pain of hunger" is to indicate that our sensory feedback is not neutral and we can discern without prior learning what is "acceptable" and "unacceptable." Still, this ability does not mark off any further learning process.

The clue to the system of our responses is the question of what induces our motivation to act, which is what we learn over the whole course of our lives. As Tomkins explains, what distinguishes the affect system from the drive system is the infinite number of instigators and reducers of the same affect, such as a child's cry "in distress if it is hungry or cold or wet or in pain or because of a high temperature" or eventually a cry at some learnt stimuli for which there are "no inherited releasers" (13). However, in real life composed of the unlimited number

of "stimulus-affect-response" variations, the price for this flexibility is "ambiguity and error" in our choices:

> The individual may or may not correctly identify the "cause" of his fear or joy and may or may not learn to reduce his fear or maintain or recapture his joy. . . . If the feedback of the affective response is motivating, then whatever instigates, maintains and reduces the affect also becomes equally motivating. . . . The face which frightens the child can become the fear-causing face and the eventually the to-be-avoided face. So long as the instigator of the affect is correctly identified, any inborn, invariant relationship between instigator and affect guarantees that the former becomes motivating (Tomkins 13).

This is yet another vital observation made by Tomkins on the nature of affect-generated motivation, which will constitute the framework for the presented study. The analysis intertwines the direct textual and computational analysis of the characters' motivations (Jude's obsessive self-destruction, Willem's emotional instability, Harold's parental selflessness) as well as the meta-level analysis of the reader's idiosyncratic response to Jude's traumatic life story ("quasi-mimetic evocation of real-life experience," cf. Fludernik's *experientiality* (12)). On the basis of Tomkins' concept of *affect*, it may be argued that Jude's basic units of childhood experience, which Tomkins called *scenes,* consisted of disproportionately high numbers of *SARs (Stimulus-Affect-Responses)* which projected violence and sexual abuse that he experienced on a daily basis until the age of 16. Therefore, the *scripts,* that is patterns which emerged as a result of the character's constant exposure to violent and abusive treatment in childhood, later in his adult life triggered the variables of motivation responsible for the activation of punishing affects, leading to Jude's self-harm rituals, and eventually to his suicide.

In sum, what emerges from Clare's and Tomkins' proposals is the encouragement to engage in affect-inspired studies, yet on condition that we approach affect holistically as psychological amplifiers of drive signals and situationally-embedded occurrences generating sensory feedback translated into specific motivations. If we do not understand the nature of affect and its role in triggering emotional responses, it is difficult, if not impossible, to carry out a comprehensive analysis of the intricacies of human reactions to various stimuli, both within the novel's construction of characters and outside of its fictional world – in the *texture* of the reader's affective response through the activation of certain scripts as memories of past experiences. Looking at the narrative from the perspective of its affective resonance, it may be concluded after Clare that the narrative not only exploits the reader's pre-conceptions of the world, but also "at times asks its reader to 'do work' when encountering a text's formal breaks, interruptions, recursions, or meta-moments" (268). This is what Clare defines as an *affective labour of reading,* another term for *metaffective reading,* for the "aesthetic techniques of metafiction help to create ruptures, reflexivity, and distance – the very 'in-between' spaces where affect thrives and pulses" (268). These are precisely those 'in-between' spaces that Stockwell defines as *edges*.

Transitioning across the Edges of Multiple Narrations in the Context of Ronald W. Langacker's Current Discourse Space Model and Peter Stockwell's Concept of *Texture*

The experience of reading a novel involves a complex mental operation of storing and reconfiguring the ruptured meanings due to viewpoint switches accumulated along the course of the plot's progression. Looking at this process from a cognitive perspective, a conceptual parallel can be drawn between the two types of communicative exchanges: (a) between the speaker and the hearer (as in cognitive linguistics; cf. Fauconnier; Johnson; Lakoff; Lakoff and Johnson; Langacker, *Foundations of Cognitive Grammar* Vol. I; Langacker, *Foundations of Cognitive Grammar* Vol. 2; Talmy) and (b) between the focalizer and the reader (as in cognitive poetics; cf. Boyd; Brône and Vandaele; Gavins and Steen; Stockwell, *Cognitive Poetics*; Tsur. The overlapping concept in both spoken and written communication is the idea of Current Discourse Space (CDS). The term was first used by Ronald W Langacker in his article "Discourse in Cognitive Grammar" (2001) and later developed in several books, including his 2013 book *Essentials of Cognitive Grammar,* where the CDS is defined as a "mental space comprising everything presumed to be shared by the speaker and hearer as the basis for discourse at a given moment" (*Essentials of Cognitive Grammar by Ronald W. Langacker* 59). The CDS develops gradually, mirroring the basic learning process, where the new knowledge is built upon the existing basis and "at each step the current expression is constructed and interpreted against the background of those that have gone before" (59). As the communication unfolds, with each single development, called by Langacker a usage event, the the CDS gets successively "updated" (59).

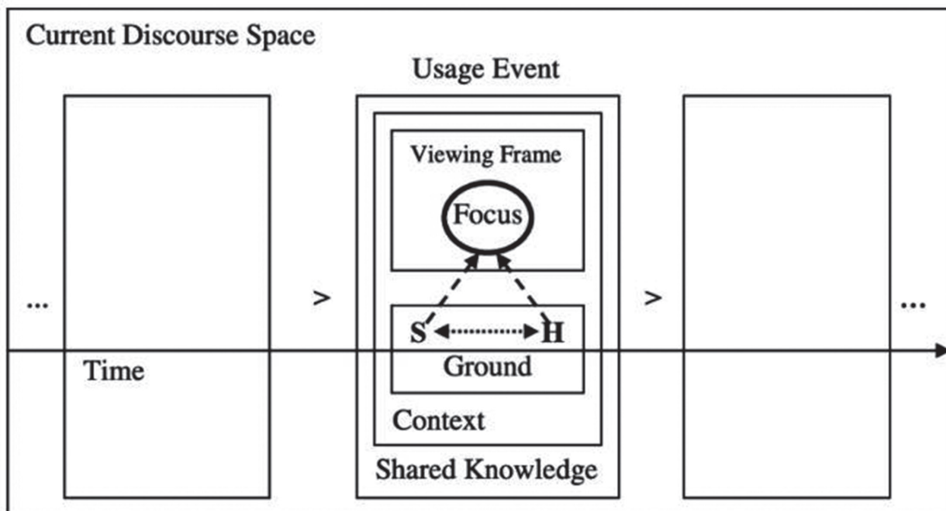


Figure 1: Current Discourse Space model by Langacker (2001, 2013)

To transfer the concept of the Current Discourse Space into the reader's engagement (or communication) with a novel, we need to broaden the scope of a usage event beyond a spoken interaction between a speaker and a hearer. Indeed, what is absent in the reading process is the aspect of *attentional framing* (Langacker "Discourse in Cognitive Grammar" 154) through the vocalization channels including intonation or gesture shared by the participants in concurrent physical time and space. The absence of the physical presence of the communication participants does not, however, disqualify the process of reading a novel from its capacity to be analyzed as a communicative usage event. Taking into consideration the parts that make up such an event outlined by Langacker, its mechanics can be adapted to the reading process with an accommodation regarding the participants using a different channel.[1] Firstly, the participants who in Langacker's model are called the speaker (S) and the hearer (H) shall be termed the focalizer (F) and the reader (R) respectively. The concept of the focalizer (Genette; Bal) is broad enough to include various perspectives through which the narrative is presented, depending on the focus of the analysis (who sees vs. who speaks). Secondly, despite the altered channel of communication (written instead of spoken word), the functions of the participants remain the same as in Langacker's original model: the focalizer holds the initiative while the reader is responsive.

How can we account for such a heteronymous experience as literary reading with the use of Langacker's concept of the Current Discourse Space? The framework for blending textual description with psychological modeling is materialized in the notion of *texture* proposed by Peter Stockwell.[2] The reason for the choice of this particular model is Stockwell's explicit reference to rhetoric, my life-long interest, which serves here as the bridge between the classical tradition, which would always elevate the role of the audience in the speech act, and the most recent developments in cognitive science, applied to the process of literary reading in the field of cognitive poetics.

In the opening chapter of *Texture - A Cognitive Aesthetics of Reading*, Stockwell makes a definitional distinction between *text, textuality* and *texture*:

> Humans are comprised of minds, bodies and shared experiences.
> *Texts* are the objects produced by people drawing on these resources.

1 The scope of the present analysis does not include the notion of instant responsiveness inherent in oral communication

2 This is one of the proposals for merging narrativity with experientiality across the fields of cognitive linguistics and cognitive poetics. Another example where Langacker's Current Discourse Space model is juxtaposed with (Martínez)' model of Storyworld Possible Self is proposed by Anna Kędra-Kardela and Henryk Kardela in their article "The *Speaking Subject* in Jerzy Bartmiński's *Linguistic Worldview Program:* A Cognitive Grammar Perspective" (2019). For reasons of space and clarity their argument will not be developed here, but it must be emphasized that the authors present a comprehensive survey of literature on the author-reader relation, referring, among others, to Barthes' "The Death of the Author," (1986), Bakhtin (1986), Burzyńska (2006), Claassen (2012), Kalaga and Prower (1990). Moreover, Anna Kędra-Kardela (2010) and Andrzej Kowalczyk (2017) have applied another concept of Ronald W. Langacker's Cognitive Grammar to their literary analyses, namely the Cognitive Narrative Frames (CNFs) which serve to close the "interpretational gaps" in the text.

> *Textuality* is the outcome of the workings of shared cognitive mechanics, evident in texts and readings.
> *Texture* is the experienced quality of *textuality* (1).

While it is not plausible to transpose Langacker's Current Discourse Space model onto Stockwell's concept of *texture* on a one-to-one basis, there is one particular characteristic which brings them close together. This is the notion of prototypicality, which is a key concept in cognitive linguistics (Lakoff; Evans and Green). While human categorization forms a backbone of our human activity, both Langacker and Stockwell agree that categorization is "very much more fluid, provisional, adaptable and contingent than this" (7). Indeed, the more distant from the prototypical laws and conventions is the narrative's plot or characters, the greater the cognitive engagement on the part of the reader in order to maintain the connection with the story world and make sense of it within the reader's accessible ontological domain. This fluidity of conceptual engagement with the novel reflects Fludernik's definition of *mimesis* which "must *not* be identified as imitation but needs to be treated as the artificial and illusionary projection of a semiotic structure which the reader recuperates in terms of a fictional reality" (35). Moreover, what CDS and *texture* share in common is the avowal of the process of recuperation referred to by Fludernik. Recuperation, based on "cognitive parameters gleaned from real-world experience, inevitably results in an implicit though incomplete homologization of the fictional and the real worlds" (35). Before the homologization can occur, the reader must cross back and forth several world levels to assemble an ample sum of ideas to come to terms with ontological shifts involved in a "self-reflexive activity consisting of a real integrated personality mediating a partial avatar of themselves" (Stockwell 107). The most affectively demanding movement happens at the moments of crossing various ontological borders between the text worlds, which Stockwell refers to as *transitional moments* or *edges.*

The concept of *edges* is of great significance for this study, which is based on measuring the effects of edge processing while maneuvering between the three distinct accounts of one life story. Stockwell assigns to the edges a mathematical *vector* value, which is a sum of its magnitude (size or length) and its directionality or orientation. After Peterson and Enns, Stockwell refers to the set of qualities of edges (object-boundaries) as *edge complex* which usually requires a noticeable processing effort. Another consequence of imagining edges as vectors guiding a reading process is endowing the whole process with the quality of movement, and, consequently, of SPACE as a basic source domain of metaphors relating to the point of view. When, for instance, Palmer in *Fictional Minds* talks of intermentality of narratives, we imagine one mentality *crossing over* [=movement] towards another. As Stockwell explains: "[t]he crucial relationship between reader and fictional entities is at base a spatial one, which is then extrapolated and projected into higher-level and more complex social, emotional and ethical relationships" (*Texture - A Cognitive Aesthetics of Reading* 109). Altogether, Stockwell enumerates four dimensions of the spatial scheme to take into consideration when elaborating on the reader's orientation to the characters' worlds. They are: *distance, direction, pace,* and *quality* of movement. Stockwell schematizes the relationship of

the reader to the character in the following graphic model (*Texture - A Cognitive Aesthetics of Reading* 110):

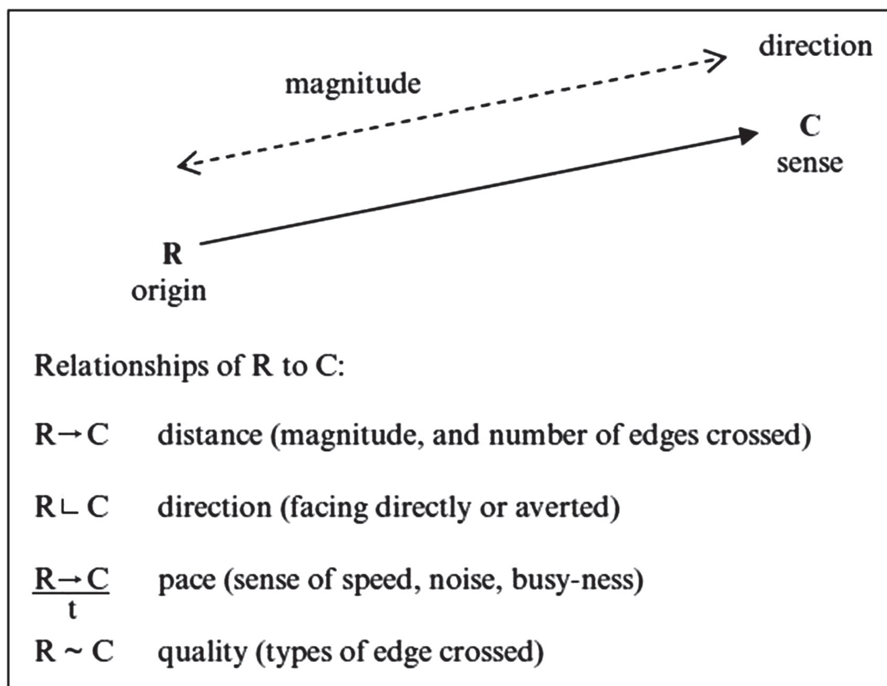


Figure 2 : Viewpoint as vector by Stockwell (2009)

The transitioning occurs along a specific vector line, each "composed of [six] braids of deictic dimensions" (128):

- Perceptual deixis (pronouns, demonstratives, definite articles and definite reference, and verbs of mental states)
- Spatial deixis (locatives, spatial adverbs, distal demonstratives, verbs of motion)
- Temporal deixis (locatives, temporal adverbs, tense and aspect)
- Relational deixis (encoding of social position)
- Textual deixis (self-referential *textuality*, iconicity, sense of *texture*)
- Compositional deixis (interpersonal extratextual features).

The difference between the "braided" model and the traditional categories of deixis lies in moving away from the "viewpoint of the deictic centre being encoded in the text (the character terminal), rather than in combination with the interlocutor of the discourse" since "[d]eixis is always relative to an interlocutor's location, and this in general is captured in the vector line" (128). The consequence of this claim is that the virtual movement between text worlds is viewed as dynamic and *reader-*

originated. What does it mean, for instance, to lose yourself in the story if we assume that you can actively shift in and out of it? Stockwell explains this sensation as a "focusing of attention on the shifted deictic centre so that the reader's sense of their own deictic positioning suffers from *decay*" (129). In the case of multivocality of narrators in *A Little Life*, the multiple viewpoints may be explained as a "diverted angle of the vector" between the reader and the main character through the three intervening narratives. The reader's processing of the *edgework* gets additionally complicated due to the fact that in the novel the three narratives are never explicitly attributed to a particular narrator, so it is often well into a few pages of the chapter that the focalizers' respective identities may be identified through a complex process of associations on the reader's level of *texture*. The reader is being taken to one of the character-narrator's minds, vectored through a third-person narration and thus it takes a while before a perceptual or relational deictic shift enables crossing the text world borders to allow for a proper *edgework* to be done before moving on to the next discourse space.

Sentiment Analysis for Traversing Boundaries between *Textuality* and *Texture*

In order to examine the vector shifts among the three characters whose intermittent narrative sequences constitute the complementary structure of the main character's text world within Yanagihara's fiction, the study applies the computational method of text mining with the use of R environment software for programming the reproductive coding sequences of sentiment analysis for the three selected samples from *A Little Life* novel. The decision of applying a computational method for text analysis was inspired by Stockwell's assertion that "[e]dgework is work at the edge, which can only be discussed by describing the actual nature of the edge-boundary in textural terms" (*Texture - A Cognitive Aesthetics of Reading* 131). This in turn entails that the "transitioning work that the reader engages in is worked upon actual textual material." The process of the analysis will be divided into two stages. The first stage corresponds to the work on the level of *text* and *textuality* of the novel with the use of computational text mining methods for extracting affective and emotional construal of the three analyzed characters-focalizers: Jude as the main protagonist, Willem as his partner and Harold as his father. The second stage places the text-based results of the quantitative analysis of sentiments alongside the qualitative analysis of the reader's perception of the three characters which had been conducted prior to the computational stage of the study. The aim of the study is to determine to what extent the levels of *textuality* and *texture* are compatible in the affective dimension of multiperspectivity.

This present study began with the qualitative analysis of intradiegetic space within the realm of *text* and *textuality*. Hanya Yanagihara's novel *A Little Life* tells the story of four young men: Willem, Jude, JB and Malcolm, all graduates of the same prestigious New England university, who set about establishing adult lives in New York City. They represent an array of diverse characters, tightly bound to each other, but the present study will focus on two of them: Willem Ragnarsson,

the handsome son of a Wyoming ranch farmer of Scandinavian origin, who starts off as a waiter but aspires to be an actor and eventually becomes a world-known star and an Academy Award winner; and Jude St. Francis, a successful lawyer and mathematician, whose provenance and ethnic origins are unknown for the most part of the story, even by his trio of friends. Jude, we later learn, was a foundling, deposited in a bag by a dumpster and raised in a monastery where he was sexually abused. He was then kidnapped by Brother Luke, a pedophile who made money on Jude's prostitution. As a teenager he was captured by a psychopath, doctor Traylor, who drove over him with his car, causing irreversible neurological damage to Jude's spine and legs, which finally result in amputation when he is in his 50s. Another character who comes to the fore is Harold, a law professor who develops a strong paternal affection for Jude, an exceptionally talented student of his, and eventually, together with his wife Julia, becomes his adoptive parent. What Willem and Harold share in common is the fact that both experienced an emotionally devastating loss of a disabled member of their families: Willem's older brother Hemming, who was born with cerebral palsy, died while Willem was in college, and Harold's only biological son Jacob, who suffered a neurological disease, passed away at a young age, making Harold and his first wife Liesl split as they were unable to carry on their relationship marked with the trauma of losing a child. Yet the clearest sign that *A Little Life* will not be what we expect is the gradual focus of the text on Jude's mysterious and traumatic past. As the pages turn, the company of friends recedes and Jude comes to the fore with his unsettling meditation on sexual abuse, suffering, and the difficulties of recovery.

What inspired and shaped the present study was a question I encountered in Matthew L. Jocker and Rosamond Thalken's book on a literary text analysis in R environment (2020). One of the study questions following the analysis of a sentence polarity in *Moby Dick* asked: "Do you, as a human reader, identify these sentences as positive? How about the negative sentences?" (Jockers and Thalken 174). This question made me realize that there is an ongoing negotiation of meanings encoded in the text and extracted by a human reader, which goes beyond the level of the novel's intradiegetic *textuality*, but is carried on to the higher level of *texture*, where human cognition is blended with thought and experience. Therefore, I designed the study with the aim to answer this seemingly simple but puzzling question if what I read into the text is actually there. Admittedly, some doubts may be raised whether the sentiments measured by sentiment analysis are "in" the text, given that the values attached to certain words were at some point in the programming process assigned by human readers. This methodological concern, however, refers more broadly to the tenets of the NRC Word-Emotion and Word-Sentiment Association Lexicon applied in *syuzhet* software package (http://saifmohammad.com/WebPages/NRC-Emotion-Lexicon.htm), but since the lexicon has been approved by the software creators, its application does not undermine the results and the discussion in this case study.

The first step along the way was to confront my impressions of the three characters with the actual textual key word frequencies to see if my intuitive reading corresponded to the respective character construction in the novel. To begin

with, the text of the novel was divided into three sections, each containing the narratives of Jude, Willem and Harold as focalizers. At this stage it was already visible that the narratives' lengths represented an interesting ratio, with Harold's shortest part constituting one third of Jude's part and Willem's part coming in as second with a two-third ratio. This came as no surprise because even though their accounts come in alternating order, yet the dominance of Jude's voice can only be fully discerned by the end of the book.

In order to compare if my "human reader" intuition was in close correspondence to what was encoded in the text, upon the close reading of *A Little Life* novel, the text was first manually and thus intuitively annotated for key words/ phrases/concepts which in my "human" opinion would best describe the three characters. Using a close reading technique, I searched the text for the words of higher relevance for each character and the choice was based solely on my personal judgment. My individual impressions inscribed in the hand-drawn mind maps were the following: while Jude was invariably *negative* and *unsettling* in his subjectivity as he was unable to get away from thinking of his *"ill" body*, Willem represented a middle way with his *love, trust* and *devotion* towards Jude, yet in their romantic relationship he would mostly expect *reciprocity* (what it gives *ME* [=Willem]) and he was the one of all the three of them who constantly evolved emotionally. Harold, on the other hand, invested his whole individuality into *selfless love, care* and *protection* for Jude (what it gives *HIM* [=Jude]) and so he passed on as a stable and fixed character on the outside, yet in his narratives he would constantly analyze if he was doing things right. This was understandable since Jude's horrific past was only revealed to him after Jude's suicide and their relationship was based on Harold's selfless devotion as a parent who would never question his child, but rather himself.

Having analyzed the three characters' narratives as a "human reader" using the close reading method, I then proceeded with the computational analysis of the same fragments, starting with the wordclouds (*wordcloud* package ver. 2.6 https://www.rdocumentation.org/packages/wordcloud/versions/2.6/topics/wordcloud, stop words removed, words plotted in decreasing frequency, color coded). The three wordclouds which were subsequently generated on the basis of the word frequency in the three narratives were indeed in close correspondence to my individual assessment of characters based on close reading. The results they returned highlighted Harold's internal insecurity of a parent (as Jude's "father he will "never know"), Willem's desire to have a meaningful relation with Jude (the "relationship" he "always wanted" and was "trying" to build) and Jude's internalized "pain" reflected in his preoccupation with his "body" and "feeling harm" ("arm", "legs", "pain", "cutting" in the "bathroom", "wounds"). It is also visible that the density of the plotting increased proportionately to the length of the analyzed text.

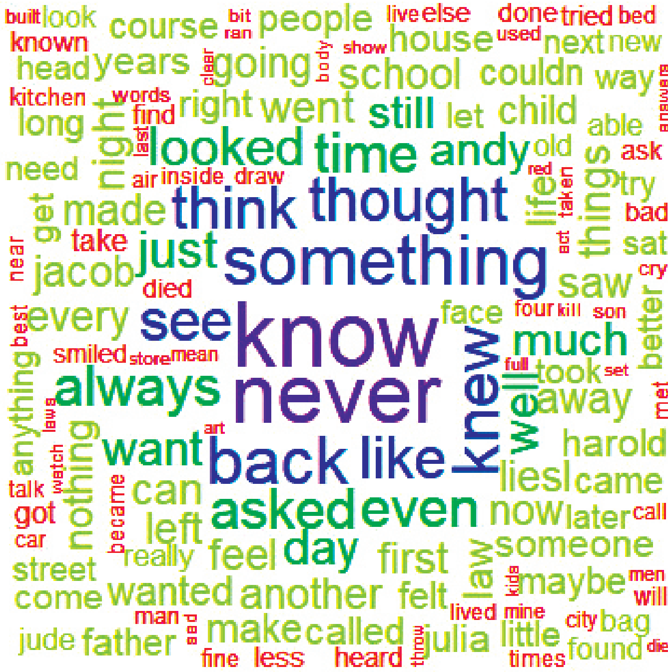


Figure 3: Wordcloud for Harold

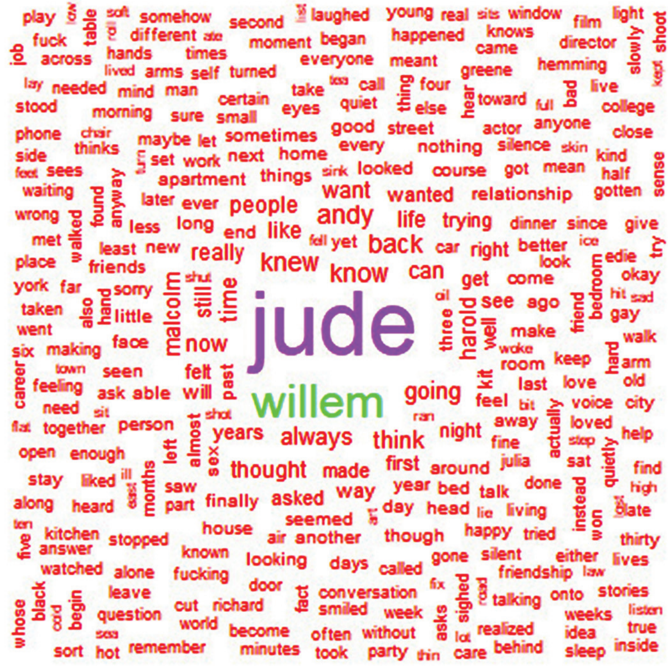


Figure4: Wordcloud for Willem

Figure 5: Wordcloud for Jude

Next, the three narratives were analyzed with regard to emotionally charged language. The sentiment analysis was carried out using the *syuzhet* package which determines the positive or negative emotional valence of a sentence.[3] The *syuzhet* package was designed by Matthew Jockers who took a cue from Kurt Vonnegut's observation that "the highs and lows of the conflict and conflict resolution can be understood as deriving from the emotional highs and lows of the characters in the story" (Jockers and Thalken 159). As the author explains, "Instead of finding instances of a specific token, such as *whale*, sentiment analysis maps specific word tokens to specific sentiment values. These values, which are looked up in a sentiment dictionary (or 'lexicon') range from positive to negative according to the specific design of the dictionary" (159). In this study the NRC sentiment dictionary was used for calculating the presence of eight emotions and their corresponding valence (positive/negative) in the text file.

Syuzhet package is not perfect because unlike *sentimentr* package, it does not handle negation (as shown in sentence 3 in Fig. xx where "didn't care" was

3 Details regarding the *syuzhet* package can be found in Jockers and Thalken's *Text Analysis with R: For Students of Literature,* Chapter 14.

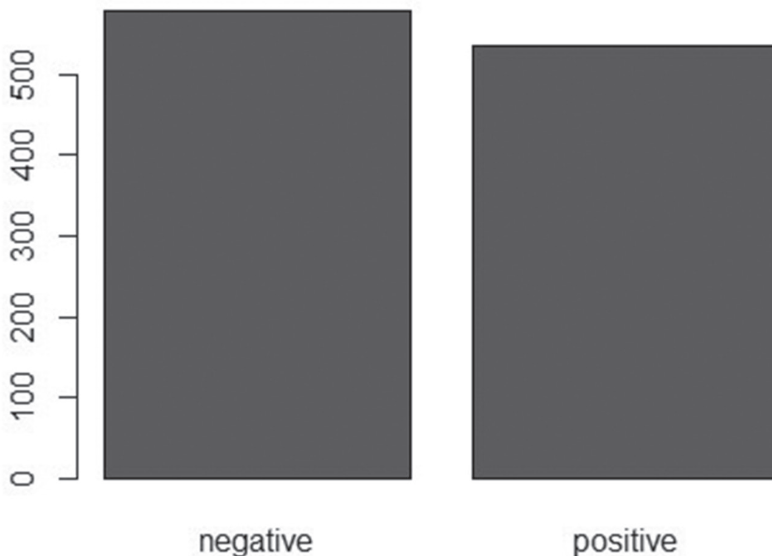
	jude_sentences	sentiment_vector
1	JUDE He knew French and German.	0.00
2	He knew the periodic table.	0.00
3	He knew—as much as he didn't care to—large part...	1.00
4	He knew how to help birth a calf and rewire a lamp ...	2.25
5	(And then he knew things he wished he didn't, thing...	-1.25
6	The languages and the math, fine.	0.25
7	But daily he was reminded of how much he didn't k...	0.00
8	He had never heard of the sitcoms whose episodes ...	0.00
9	He had never been to a movie.	0.00
10	He had never gone on vacation.	0.80
11	He had never been to summer camp.	0.00
12	He had never had pizza or popsicles or macaroni an...	-0.40
13	He had never owned a computer or a phone, he had...	0.00
14	He had never owned anything, he realized, not reall...	-0.50
15	The classroom was the safest place, and the only pl...	-0.65

Figure 6: Sentiment vectors for Jude

assigned a +1,00 positive vector).[4] However, according to Jockers and Thalken, "*syuzhet*'s style of sentiment analysis is suited for studying novels because it

4 The *syuzhet* package has generally been criticized for the low level of precision of word-by-word lexicons it contains ("Bing," "AFINN," and "NRC") and the inaccurate representations of the stories' plot and emotional valence trajectories (https://annieswafford.wordpress.com/2015/03/02/syuzhet/). Matthew L. Jockers addressed these concerns at http://www.matthew-jockers.net/2015/03/04/some-thoughts-on-annies-thoughts-about-syuzhet/. He commented on the complexity of handling negators and modifiers in a following way: "Take, for example, the sentence "I studied at Leland Stanford Junior University." The state-of-the-art Stanford sentiment parser scores this sentence as "negative." I think that is incorrect (you are welcome to disagree;-). The "bing" method, that I have implemented as the default in syuzhet, scores this sentence as neutral, as does the "afinn" method (also in the package). The NRC method scores it as slightly positive. So, which one is correct? We could go all Derrida on this sentence and deconstruct each word, unpack what "junior" really means. We could probably even "problematize" it! . . . But let's not." Therefore, in this study, the presence of negators and modifiers which shift the valence between positive and negative was not accounted for in the final results. Moreover, Tyler Rinker, the creator of a competitive *sentimentr* package, in his comparative analysis of the four most popular sentiment detection packages and algorithms: *syuzhet, sentimentr, meanr and Stanford* run on data sets of reviews from services such as amazon.com and imbd.com, concluded that "Jockers' **syuzhet** was designed to be applied across book chunks and it is, to some extent, unfair to test it out of this context" (https://github.com/trinker/sentimentr#comparing-sentimentr-syuzhet-meanr-and-stanford).

helps us consider the progression of sentiment from the beginning to the end of a text. This means that the focus is turned away from the actual *events* in the novel, and more toward the author's *presentation* or *organization* of the plot" (160, emphasis original). The barplots visualize first the polarity of a particular focalizer's narrative (positive/negative sentiment) and then the distribution of the eight emotions encoded in NRC dictionary (anger, anticipation, disgust, fear, joy, sadness, surprise, trust).



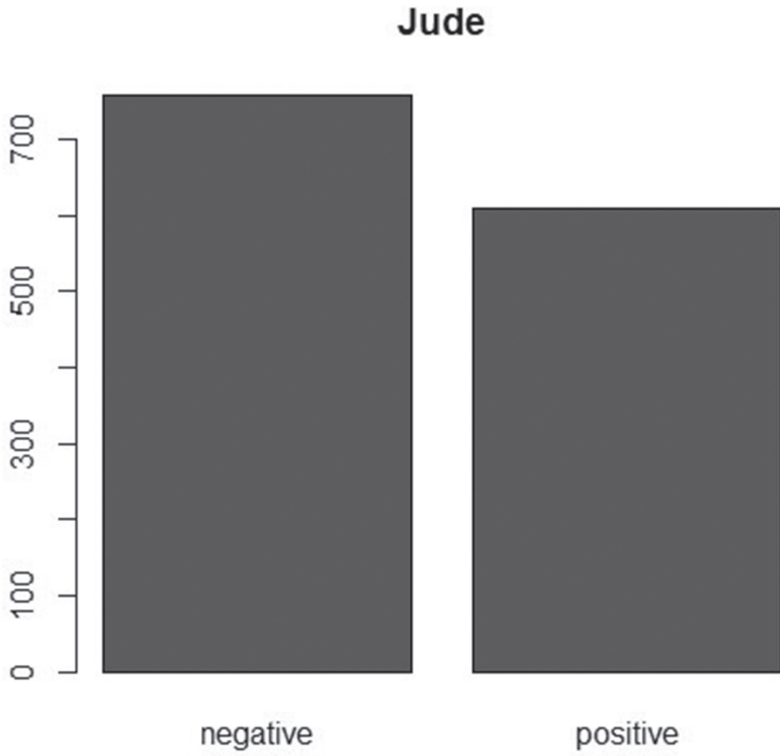
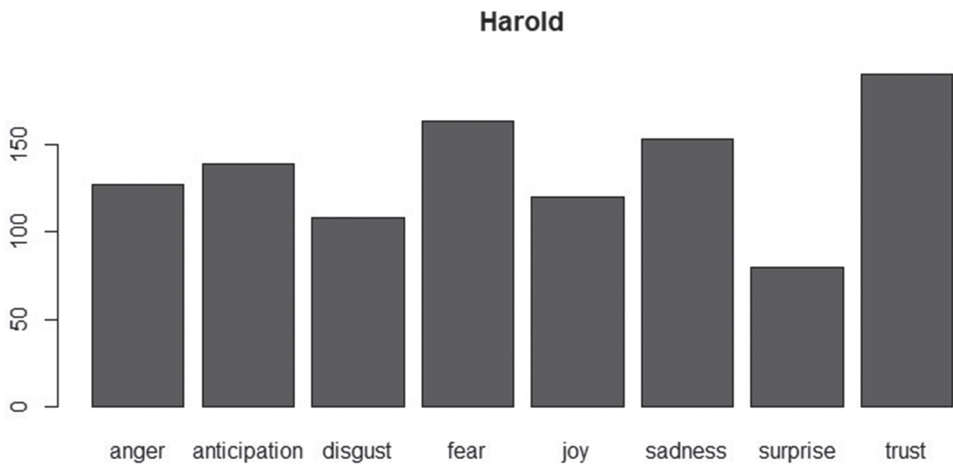


Figure 7: Sentiment polarity for Harold, Willem and Jude



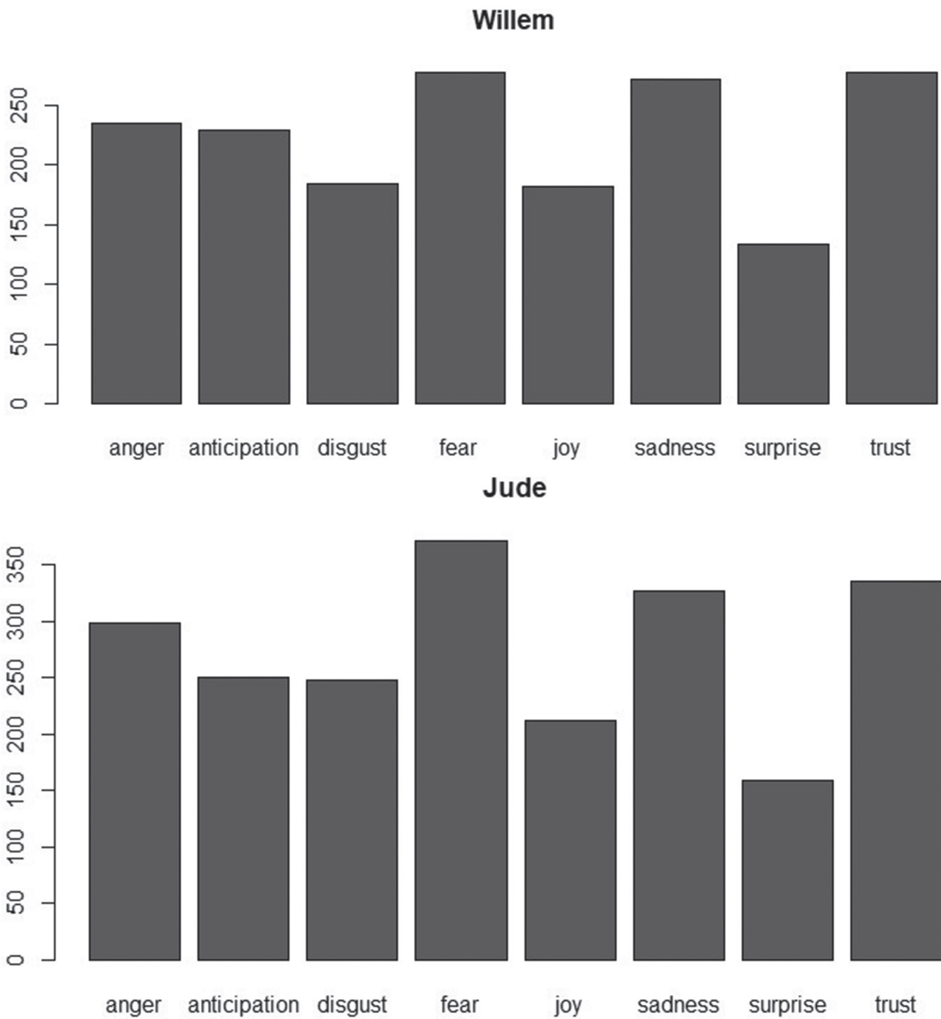


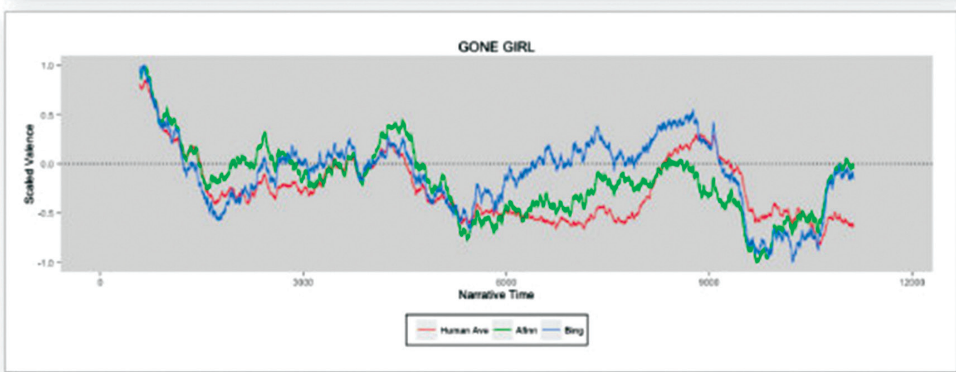
Figure 8: Sentiment distribution for Harold, Willem and Jude

The interplay of positive and negative sentiments is what delineates the analyzed narratives. As the results of the analysis indicate, it is Harold who leads the rank in positivity and Jude whose negativity significantly surpasses the other two. As for the distribution of emotional charge, Harold's reliance on trust and Jude's propensity for fear mark the two opposing traits of their outlooks and personalities. Willem represents the middle ground with relatively equal yet dominant vector values for fear and trust, interestingly followed by sadness.

```
> harold_scores
  anger   anticipation     disgust    fear    joy  sadness  surprise  trust
1 27      139              108        163     120  153      80        190
  negative          positive
1 330               340
```

```
> willem_scores
  anger  anticipation  disgust  fear  joy  sadness  surprise  trust
1 235    229           184      277   182  271      133       277
  negative        positive
1 578             535
> jude_scores
  anger  anticipation  disgust  fear  joy  sadness  surprise  trust
1 298    250           248      371   212  327      159       336
  negative        positive
1 758             610
```

The computer model was concurrent in detecting the degree of general positive and negative sentiment in the three narratives in accordance with the conclusions drawn from close reading. Or, should I reverse the order and say instead that my close reading was careful enough to detect the sentiments encoded in the texts. Either way, the emotions encoded on the intradiegetic levels of *text* and *textuality* traverse the edges of the three distinct narratives to eventually meet on the higher level of *texture* and project a common vector towards the main character, Jude St. Francis. This observation may be criticized for hinging upon tautology, but here it must be emphasized that it is not the end result which matters, but the process going on in human mind to direct the vectors of the meaning construction pointedly at the character while doing the *edgework* across the competing textualities of concurrent narratives. The determination of human mind to stay on track despite the shifts of focus generated on the level of *text* and *textuality* was demonstrated by Jockers in his 2015 study of moving averages of sentiments in several novels in which sentiments were both human and machine coded (Fig. 9). Jockers himself admitted that "The similarity of the shapes derived from the the human and machine data is quite striking."



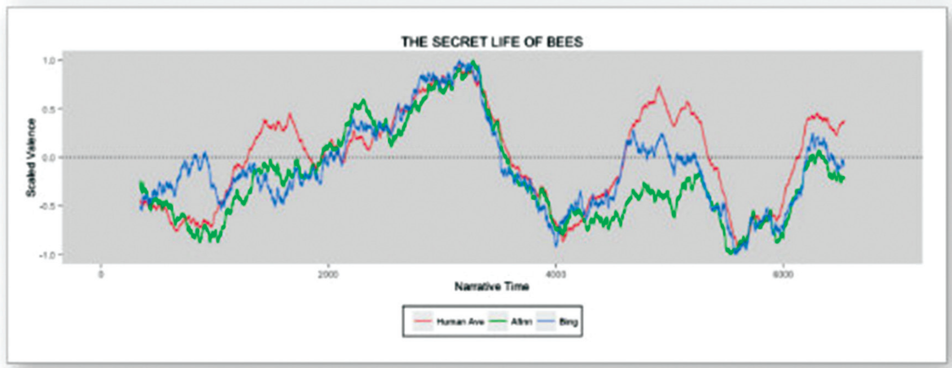


Figure 9: Human and machine coded sentiments combined (Jockers 2015)

Yet the function which in my view offers the greatest potential for further analysis in the computational study of sentiments is the function of marking the outliers, which indicate the most positive and the most negative sentence in the analyzed text. As the three boxplots indicate, the highest proportion of the box above the median of 0.00 belongs to Harold, which again proves Harold's comparatively positive attitude in contrast to Jude's most prominent negativity. This negative polarization of Jude's narrative is demonstrated in his boxplot. The proportion of Jude's box below the 0,00 median is visibly larger compared to the boxes of the other two characters. On the basis of these results we might further wonder what the character terminal of the vector for Jude would be like on the *texture* level if it was not for Harold's and Willem's positive tones interceding Jude's highly pessimistic narrative.

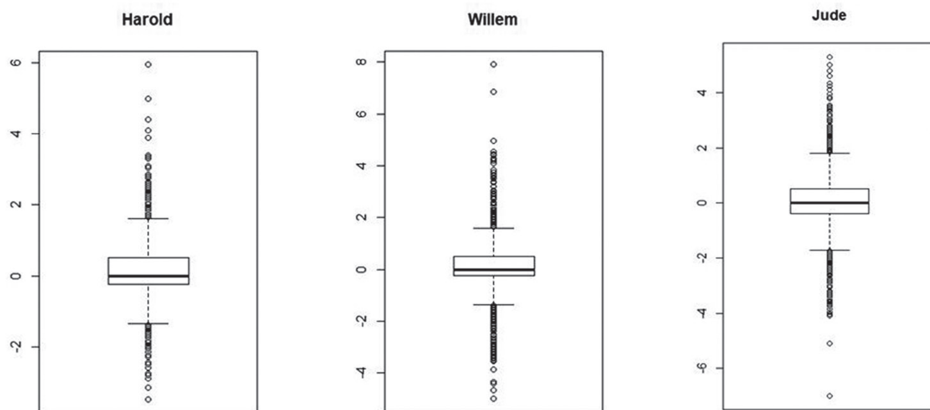


Figure 10 : Boxplots of sentiment distribution (min/max) for Harold, Willem and Jude

Now, the focus shifts to the dots at the highest and lowest end of the boxplot. These are the outliers and their content analysis through the close reading perspective of traditional literary studies would generate a truly insightful perspective on the three characters. The machine analysis renders the following results, first locating

the position of the most positive and the most negative sentence in the text, and then extracting its content:

```
> most.positive
  harold_sentences
379 I admired how she knew, well before I did, that the point of a child is not what you hope he will accomplish in your name but the pleasure that he will bring you, whatever form it comes in, even if it is a form that is barely recognizable as pleasure at all—and, more important, the pleasure you will be privileged to bring him.
  sentiment_vector
379       5.95

> most.negative
  harold_sentences
1140 I'm so stupid, I'm so clumsy," and although we told him it wasn't a problem, that it was fine, he only grew more and more upset, so upset that his hands started to shake, that his nose started to bleed.
  sentiment_vector
1140      -3.5

> most.positive
  willem_sentences
1605 "Ragnarsson is on vacation and was unavailable for comment, but his representative confirmed the actor's relationship with Jude St. Francis, a highly regarded and prominent litigator with the powerhouse firm of Rosen Pritchard and Klein and a close friend since they were roommates their freshman year of college," he read, and "Ragnarsson is the highest-profile actor by far to ever willingly declare himself in a gay relationship," followed, obituary-like, with a recapping of his films and various quotes from various agents and publicists congratulating him on his bravery while simultaneously predicting the almost-certain diminishment of his career, and nice quotes from actors and directors he knew promising his revelation wouldn't change a thing, and a concluding quote from an unnamed studio executive who said that his strength had never been as a romantic lead anyway, and so he'd probably be fine.
  sentiment_vector
1605      7.9

> most.negative
  willem_sentences
2537 Two years ago, he had spent this very weekend—Labor Day weekend —in a hospital on the Upper East Side, staring out the window with a hatred so intense it nauseated him at the orderlies and nurses and doctors in their jade-green pajamas congregating outside the building, eating and smoking and talking on their phones as if nothing were wrong, as if above them weren't people in various stages of
```

```
dying, including his own person, who was at that moment in a medically induced coma, his skin prickling with fever, who had last opened his eyes four days ago, the day after he had gotten out of surgery.
  sentiment_vector
2537      -5

> most.positive
  jude_sentences
1138 He did, however, invite Andy in one of their midnight conversations, which he grew to enjoy: in those talks, they discussed everyday things, calming things, normal things—the new Supreme Court justice nominee; the most recent health-care bill (he approved of it; Andy didn't); a biography of Rosalind Franklin they'd both read (he liked it; Andy didn't); the apartment that Andy and Jane were renovating.
  sentiment_vector
1138      5.3

> most.negative
  jude_sentences
3244 The clients called him names: he was a slut, a whore, filthy, disgusting, a nympho (he had to look that one up), a slave, garbage, trash, dirty, worthless, a nothing.
  sentiment_vector
3244      -7
```

The analysis of these results would be long enough to occupy the space of the full-length academic article. Suffice to say that the outliers serve as lenses towards the highest emotional valence of a given focalizer and as such define the unsettling extremes of their individual subjectivity. It is through this type of insight that we would be able to make a conjunction with Tomkins' typology of affects and develop an argument that a truly revealing study of Jude's character would entail transitioning along the affect vectors of fear–shame–self-contempt complex.[5]

Vectors of the Reader's Processing Path: from *Textuality* to *Texture*

Reading *A Little Life* was like Harold's reading the letter Jude had written to him and Julia, his adoptive parents, before he committed suicide: "It took us several days to read, because although it was brief, it was also endless, and we had to keep putting the pages down and walking away from them . . . – Ready? – and sitting down and reading some more" (Yanagihara, *A Little Life* 813). The pauses while

5 As Tomkins observes: "While terror and distress hurt, they are wounds inflicted from outside which penetrate the smooth surface of the ego; but shame is felt as an inner torment, a sickness of the soul. It does not matter whether the humiliated one has been shamed by derisive laughter or whether he mocks himself. In either event he feels himself naked, defeated, alienated, lacking in dignity or worth" (351).

reading were frequent, for Jude's life was anything but little and so much more than tragic. It resembled this letter – brief yet endless – and in the end the only way it could be internalized was through the metaphor/oxymoron of a soundless cry. Despite his unique talent for mathematics and his exceptional mastering of legal argumentation, it was his skill of crying without producing any sound that Jude was really proud of. What is particularly striking about this and other similar examples of Jude's belittling confessions is that the reader gradually internalizes the conviction that "[i]t isn't only that [Jude] died, or how he died; it is what he died believing" (814).

Unfortunately, as the story progresses and the three threads of alternating narratives enter a higher level of semantic relationship beyond the discrepant figural standpoints, there is no escape from the feeling that Jude's suicide was his soundless attempt to provide a non-existent proof for the mathematical axiom of equality. No matter how straightforward was the message of love and acceptance conveyed by Willem and Harold, Jude's destructive and self-loathing belief in his inherent worthlessness, inscribed in his mind the irreversible conviction that "x will always equal x" (386). On the outside he may be a different man, practically the opposite of his previous life of a sexually-abused orphan: "The context may have changed: he may be in this apartment, and he may have a job that he enjoys and that pays him well, and he may have parents and friends he loves. He may be respected: in court, he may even be feared. But fundamentally, he is the same person, a person who inspires disgust, a person meant to be hated" (386). At this point a "diverted angle of the vector" between the reader and the main character that Stockwell has in mind when talking about the reader's investment in the *edgework* across the intertwining narratives, persistently pushes towards Jude as a deictic center. The growing sense of inevitability of Jude's suicide prompts the reader to subconsciously push the narratives of Willem and Harold off the processing path to straighten the vector and make it follow a straight line (reader → character [Jude]) without sidetracking (reader → Willem's perspective → Harold's perspective → character [Jude]) to minimize the *edgework* while navigating the story worlds. Jude's vulnerability causes that a mere microsecond of doubt in his worthiness is enough to drag him down from the "ecstasy of being aloft" to the "anticipation of his landing, which he knows will be terrible" (386).

The growing awareness of a repeated pattern of Jude's failures, including those which felt purposefully incited (as in the case of his relationship with the abusive and violent lover, Caleb), marks the transition point from the intradiegetic level of *textuality* towards the higher level of *texture*. The sense making process initiated across the three varying points of view eventually navigates the reader towards the most emotionally-charged, or most affect-generating character and his narration, which in Stockwell's terms means that "the reader is profiling the character terminal of the vector while experiencing the construal effect of being lost in the fiction" (129). The reader gradually comes to the realization that years of Willem's and Harold's genuine and hard labour of love will nevertheless transpire in this very microsecond when the "hyenas" (436) of unspeakable terrors seize Jude's mind and activate the recurrent script of his stimulus-affect-response scenario:

> . . . he knows that *x* will always equal *x*, no matter what he does, or how many years he moves away from the monastery, from Brother Luke, no matter how much he earns or how hard he tries to forget. It is the last thing he thinks as his shoulder cracks down upon the concrete, and the world, for an instant, jerks blessedly away from beneath him: *x* = *x*, he thinks. *x* = *x*, *x* = *x* (386).

Conclusion

Close reading of *A Little Life* novel, in conjunction with a computational analysis of sentiments, provided evidence that behind a philosophical determinism of Jude's "axiom of equality" rule, there lies a physiological conditioning of pain reactions (e.g. self-harm), and a psychological framing of the internalization of a long-term trauma. Even though at some point we may treat Willem's and Harold's voices as disturbances, diverting our vector away from Jude's primary narrative frame, in the end we realize that they cannot be totally eradicated. Thanks to Willem's and Harold's idiosyncratic styles of empathy and attachment towards Jude, the reader gets to realize that alternative scenarios for Jude might have been possible, yet the intensity of scenes and scripts from his traumatic childhood transcribed a certain irreversible and domineering pattern of a repeated activation of punishing affects, manifested in his urge for cutting his flesh. Moreover, thanks to a broader perspective on the Jude's support networks, the reader's awareness that his friends' efforts are in most cases doomed to fail, conclusively contributes to a more stable and definite configuration of Jude's depressive inclination on the level of *texture*. For instance, seeing Jude happy is most likely to evoke an ambivalent feeling that the protagonist is 'out of character'. In sum, the combination of three intradiegetic narrative levels, despite heightening the complexity of the reader's *edgework* across the story worlds, eventually contributed to creating a sense of cognitive consistency in the character construal. This conclusion supports Stockwell's observation that "(t)he key to the literary experience of texture . . . lies in the moments of transition or shift across different cognitive stylistic patterns. The cognitive poetic account of texture relies on capturing and describing as precisely as possible these transitional moments ("Texture" 459–60). Willem's and Harold's narrative voices helped to fill out what Roman Ingarden called "undefined places" in a literary work. These characters, endowed with a carefully constructed emotional profiles, complemented Jude's deficit of self-esteem and definitely had an impact on the reader's intermental relationship with the main character and his eventual impersonation.

Works Cited

Bakhtin, Mikhail. "The Problem of Speech Genres." *Speech Genres and Other Late Essays*, edited by Caryl Emerson and Michael Holquist, translated by Vern W. McGee, 2nd edition, University of Texas Press, 1986, pp. 60–102.

Bal, Mieke. *Narratology: Introduction to the Theory of Narrative*. 2nd edition, University of Toronto Press, Scholarly Publishing Division, 1997.

Barthes, Roland. "The Death of the Author." *The Rustle of Language*, translated by

Richard Howard. Reprint edition, Hill and Wang, 1986, pp. 49–55.

Berlant, Lauren. *Cruel Optimism*. Duke University Press Books, 2011.

Boyd, Brian. *On the Origin of Stories: Evolution, Cognition, and Fiction*. Reprint edition, Belknap Press, 2010.

Brône, Geert, and Jeroen Vandaele, editors. *Cognitive Poetics: Goals, Gains and Gaps*. De Gruyter Mouton, 2009.

Burn, Stephen J. *Jonathan Franzen at the End of Postmodernism*. Continuum, 2008.

Burzyńska, Anna. *Anty-Teoria Literatury*. Universitas, 2006.

Claassen, Eefje. *Author Representations in Literary Reading*. John Benjamins Publishing Company, 2012.

Clare, Ralph. "Metaffective Fiction: Structuring Feeling in Post-Postmodern American Literature." *Textual Practice*, vol. 33, no. 2, Feb. 2019, pp. 263–79. doi:10.1080/0950236X.2018.1509269.

Evans, Vyvyan, and Melanie Green. *Cognitive Linguistics: An Introduction*. Routledge, 2006.

Fauconnier, Gilles. *Mental Spaces: Aspects of Meaning Construction in Natural Language*. 2nd edition, Cambridge University Press, 1994.

Fludernik, Monika. *Towards a "Natural" Narratology*. Routledge, 1996.

Gavins, Joanna, and Gerard Steen. *Cognitive Poetics in Practice*. Routledge, 2003.

Genette, Gerard. *Narrative Discourse: An Essay in Method*. Cornell University Press, 1983.

Hartner, Marcus. "Multiperspectivity." *Handbook of Narratology*, edited by Peter Huhn et al., 2nd edition, De Gruyter, 2014, pp. 353–63.

Holland, Mary K. *Succeeding Postmodernism: Language and Humanism in Contemporary American Literature*. Bloomsbury Academic, 2013.

Ingarden, Roman. *O dziele literackim: Badania z pogranicza ontologii, teorii języka i filozofii literatury*. Państwowe Wydawnictwo Naukowe, 1960.

Jockers, Matthew. *That Sentimental Feeling*. http://www.matthewjockers.net/2015/12/20/that-sentimental-feeling/. Accessed 14 May 2020.

Jockers, Matthew L., and Rosamond Thalken. *Text Analysis with R: For Students of Literature*. 2nd edition, Springer, 2020.

Johnson, Mark. *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. University of Chicago Press, 1987.

Kalaga, Wojciech, and Emanuel Prower. "The Reader as Character." *Discourse and Character*, edited by Wojciech Kalaga and Tadeusz Sławek, Uniwersytet Śląski, 1990, pp. 31–39.

Kardela, Henryk, and Anna Kędra-Kardela. "The Speaking Subject in Jerzy Bartmiński's Linguistic Worldview Program: A Cognitive Grammar Perspective." *Etnolingwistyka*, vol. 31, 2019, pp. 73–86, doi:http://dx.doi.org/10.17951/et.2019.31.73.

Kędra-Kardela, Anna. *Reading as Interpretation: Towards a Narrative Theory of Fictional World Construction*. Maria Curie-Skłodowska University Press, 2010.

Kowalczyk, Andrzej. *Forms and Shadows: A Cognitive-Poetic Reading of Charles*

Williams's Fiction. Peter Lang, 2017.

Lakoff, George. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. University of Chicago Press, 1987.

Lakoff, George, and Mark Johnson. *Metaphors We Live By*. University of Chicago Press, 1980.

Langacker, Ronald W. "Discourse in Cognitive Grammar." *Cognitive Linguistics*, vol. 12, no. 2, Jan. 2001, pp. 143–88. doi:10.1515/cogl.12.2.143.

Langacker, Ronald W. *Essentials of Cognitive Grammar by Ronald W. Langacker*, Oxford University Press, 2013.

___ . *Foundations of Cognitive Grammar: Volume I: Theoretical Prerequisites*. Stanford University Press, 1987.

___ . *Foundations of Cognitive Grammar: Volume II: Descriptive Application*. Stanford University Press, 1991.

Martínez, María-Ángeles. "Storyworld Possible Selves." *Storyworld Possible Selves*, De Gruyter Mouton, 2018. https://www.degruyter.com/view/title/524815.

Massumi, Brian. *Parables for the Virtual: Movement, Affect, Sensation*. Duke University Press Books, 2002.

McLaughlin, Robert L. "Post-Postmodernism." *The Routledge Companion to Experimental Literature*, edited by Joe Bray et al. Routledge, 2014, pp. 212–23.

Palmer, Alan. *Fictional Minds*. University of Nebraska Press, 2004.

Peterson, Mary, and James Enns. "The Edge Complex: Implicit Memory for Figure Assignment in Shape Perception." *Perception & Psychophysics*, vol. 67, June 2005, pp. 727–40.

Smith, Rachel Greenwald. *Affect and American Literature in the Age of Neoliberalism*. Cambridge University Press, 2015.

Stockwell, Peter. *Cognitive Poetics: A New Introduction*. Routledge, 2002.

___ . "Texture." *The Bloomsbury Companion to Stylistics*, edited by Violeta Sotirova, Bloomsbury Academic, 2015, pp. 458–73.

___ . *Texture - A Cognitive Aesthetics of Reading*. Edinburgh University Press, 2009.

Talmy, Leonard. *Toward a Cognitive Semantics (2 Vols.)*. MIT Press, 2001.

Tomkins, Silvan S. *Affect Imagery Consciousness: Volume I and II*. Springer Publishing Company, 2008.

Tsur, Reuven. *Toward a Theory of Cognitive Poetics: Second, Expanded and Updated Edition*. Sussex Academic Press, 2008.

Vermeule, Blakey. *Why Do We Care about Literary Characters?* Johns Hopkins University Press, 2010.

Whiteley, Sara. "Emotion." *The Bloomsbury Companion to Stylistics*, edited by Violeta Sotirova, Bloomsbury Academic, 2015, pp. 507–22.

Yanagihara, Hanya. *A Little Life*. Anchor, 2015.

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