

A GOSPEL OF HEALTH AND SALVATION: MODELING THE RELIGIOUS
CULTURE OF SEVENTH-DAY ADVENTISM, 1843-1920

by

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A Dissertation
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of
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DEDICATION

To my mum, Paulina Meninga, who was the first to teach me to ask why, to get to the point, and to not stop until my arguments held water. This is for you.

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A dissertation is a work of endurance that, although attributed to a single scholar, is only possible because of the intellectual community around it. This is particularly true in the case of digital scholarship, where the intellectual work includes programming, design, narrative, and critical analysis.

I have had the privilege of working with an exceptional dissertation committee who have been deeply supportive of my historical and digital work. My final dissertation chair, Michael O'Malley, and initial chair, Sharon Leon, provided invaluable assistance and encouragement, helping me find a workable balance between the computational, theoretical, and narrative aspects of the dissertation. An always reliable source of encouragement and technical guidance, Fred Gibbs provided much needed feedback on the theoretical and technical aspects of the project. Finally, John Turner and Randolph Scully offered valuable feedback on the historical scholarship, keeping this work grounded in American religious history.

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While this dissertation primarily relies on digitized records, I visited a number of Seventh-day Adventist archives over the years of the project, including the Ellen White Estate Offices <<https://whiteestate.org/about/estate/>> in Tacoma, Maryland, Loma Linda University Archives <<https://library.llu.edu/heritage-research-center/archives-special-collections>> in Loma Linda, California, and the Center for Adventist Research at Andrews University <<https://www.centerforadventistresearch.org/>> in Berrien Springs, Michigan. As I worked to orient myself to the scope and variety of the denomination's historical materials, the archivists and staff members at these institutions provided invaluable advice and encouragement. There are numerous potential research projects in these archives, on topics including health and diet, education and religion, just waiting to be written.

Finally, all writing requires a network of support and I am not sure I would have finished this endeavor without the constant (and persistent) encouragement of friends and family.

Erin and Celeste, thank you for tackling all the unanswered questions with me and for helping me to not take any of it too seriously. The next round of cheese is on me!

Thank you to my parents for always encouraging my persistent need to ask why, for instilling in me the value of education, and for providing so much support — emotional, material, and personal — along the way. Thank you also to my siblings and in-laws for the constant support, encouragement, and childcare. And to Garrett and William. Your arrival was the icing on the cake of this long journey (and provided excellent motivation for wrapping everything up.)

A dissertation is an all-consuming endeavor, and to have someone make that journey with me has been an incredible gift. Jason, you have been my constant companion and cheerleader through these past ten years of graduate work. Thank you for not letting me

give up and for believing in me even when I didn't. I promise, no more degrees. At least not for a while.

This project would not be nearly as sturdy as it is without the input of all of these readers. All remaining mistakes and miscalculations are my own.

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LIST OF ABBREVIATIONS

| | |
|---|------|
| Ellen Gould Harmon White | EGW |
| Office of Archives, Statistics, and Research..... | ASTR |
| Seventh-day Adventist Church | SDA |

ABSTRACT

A GOSPEL OF HEALTH AND SALVATION: MODELING THE RELIGIOUS CULTURE OF SEVENTH-DAY ADVENTISM, 1843-1920

Jeri E. Wieringa, Ph.D.

George Mason University, 2019

Dissertation Director: Dr. Michael O'Malley

A Gospel of Health and Salvation is a work of digital history — defined as the critical application of computational technologies to the study of the past — focused on the relationship between time and gender in Seventh-day Adventism. In it I explore the puzzle of the denomination's prophet and religious leader, Ellen White, and her varied and seemingly contradictory writings on the role of women in the denomination. One of a few women religious leaders in nineteenth-century America, White is difficult to place within the history of American religion. Rising to prominence at the end of the Second Great Awakening, White promoted a vision of gender and women's participation in the work of salvation that fails to fit neatly into either histories of American feminism or histories of domesticity. Discussing White and her place in American religious history requires a different approach.

Using computational text analysis to find broad patterns in the denomination's periodical record, I highlight three cycles of end-times expectation that shaped the complex vision of gender articulated by White and other denomination leaders during the first seventy years of the denomination. These cycles enable me to bring together two theoretical frameworks often used to analyze the development of religious movements. Rather than a linear trajectory from religious sect to denomination, and concurrently from expansive understandings of gender to restrictive ones, the waves of end-times expectation opened space for alternative and expansive visions of gender at a number of points in the denomination's early history.

Additionally, I argue for the scholarliness of the computational work that grounds my historical analysis. Rather than neutral, the work of selecting the corpus, preparing the text for analysis, selecting modeling algorithms, visualizing the resulting model, and interpreting the results represents the first phase of interpretation and shapes the possibilities of the overall project. To make this multilayered argument, I created the dissertation as a website, rather than a traditional document. Hosted at <http://dissertation.jeriwieringa.com>, the web interface interweaves the technical, visual, and narrative aspects of the dissertation arguments. The site brings together a topic model of the denomination's periodical literature, the code used to create and analyze the model, and four interpretive essays. Together these constitute the body of work that is *A Gospel of Health and Salvation*.

INTRODUCTION

“The coming of Christ is nearer than when we first believed. The great controversy is nearing its end. The judgments of God are in the land. They speak in solemn warning, saying,” Be ye also ready; for in such an hour as ye think not the Son of man cometh." Matt. 24:44."

Ellen White, 1904¹

A Gospel of Health and Salvation is a work of digital history, defined as the self-reflective application of computational and web technologies to the study of the past. In it, I examine the role of Ellen White in the development of Seventh-day Adventism using computational text analysis of the periodicals produced by the denomination between 1849 and 1920. This introduction establishes the two foci of the dissertation:

- the gendered labor of salvation within Seventh-day Adventism, primarily as articulated by Ellen White;
- and the limits and possibilities of existing computational methods for historical inquiry.

The foci of the dissertation are connected by the question of time: how beliefs about the end of time shaped the vision of gender articulated within Seventh-day

¹ Ellen Gould Harmon White, *Testimonies for the Church*, vol. 8 (No. 36) (Kansas City, MO; Oakland, CA; Portland, OR: Pacific Press Publishing Company, 1904), p. 252

Adventism; and how exploring the denomination's embrace of alternative structures of time illuminates the need for critical engagement with the application of modern computational methods to historical research.

Together, the dissertation makes two primary interventions in the existing scholarship. First, in conversation with scholars Laura Vance, Carroll Smith-Rosenberg, and Catherine Brekus, I argue that beliefs about time were central in shaping the vision of gender articulated by Ellen White and embraced within Seventh-day Adventism. This framework provides a means of unraveling the puzzle of Ellen White's seemingly inconsistent writings on women and gender and reinforces the importance of the content of beliefs in examining the upheavals of revival periods. Using a topic model of the denomination's periodical literature, I identify a cyclical structure to the denomination's end-times expectation, and use that structure to bring together two major theoretical frameworks for discussing the development of religious movements: Mary Douglas' "religious anti-ritualism" and Stark and Bainbridge's "church-sect-cult."

Second, I argue for the scholarliness of the computational work that grounds my historical analysis, claiming that critical engagement with data and algorithms is vital for the successful application of computational methods to historical analysis. Rather than neutral, the work of preparing the text for modeling, selecting the modeling algorithms, visualizing the resulting model, and interpreting the results represents the first phase of interpretation and shapes the possibilities of the overall project. Consequently, the evaluation of the computational methods is integral to understanding and assessing the interpretive arguments. The interdependence of the code and interpretation necessitates

the publication of code and data along with narrative, accomplished here through the creation of a digital, web-based interface for the dissertation.

Seventh-day Adventism's reliance on print and their embrace of digital technology to continue their evangelistic work in the twenty-first century has created the conditions of possibility for this bi-directional study of religious culture and historical methods. Starting in 1849 with the *Present Truth*, Seventh-day Adventist leaders have used print as one of their primary evangelistic tools to share their message of sabbath-keeping with a dispersed community. As a result, the periodical literature documents the development of the denomination's beliefs and practices. Building on that commitment, their investment in the digitization and online distribution of their historical materials makes it possible to use computational text analysis to see patterns in the cultural development of the denomination over time. With a source base suited to both the historical question and the research methodology, the digital records of Seventh-day Adventism present the opportunity to examine the role of beliefs about time in the development of the denomination's religious culture and the use of computational text analysis for the study of the past.

The Puzzle of Ellen White

Ellen White is a curious figure in the history of American religion. One of a handful of women to lead a religious movement, she, unlike her contemporary Mary Baker Eddy, founder of Christian Science, and her predecessor Mother Ann Lee, founder of the Shakers, has received little attention in standard histories of American religion. This is in part because her role in Seventh-day Adventism does not fit neatly into the

typical narratives told about women in American religion. There is not a clear line from her prophetic leadership within Seventh-day Adventism to a commitment to women's rights, and her writings have even been used in the twentieth century to justify the denomination's patriarchal structure. Her life and work fall outside of the timeframe of events usually studied as part of the Second Great Awakening, as her visions began after the failure of William Miller's 1843/1844 predictions of the second coming.

Additionally, the denomination she brought into being has remained a minor figure in the landscape of American religion, although it has grown to over 20,700,000 members worldwide.² As a result, the development of her role within Seventh-day Adventism and the legacy of her writings have been largely ignored, except by denominational historians for whom she is both a historical figure and a religious authority.³

And yet despite the scholarly neglect, White and Seventh-day Adventism reveal important trends in American religious history. Seventh-day Adventism sits between established Protestant denominations and radical religious movements, in tension with their religious neighbors on both sides because of their beliefs about the Sabbath and health as well as because of their constrained understanding of prophecy and healing. Ellen White as prophet and religious leader sits similarly, occupying a rare position of religious authority while also advocating for religious restraint and respectability. In this position, the study of White and Seventh-day Adventism enables us to see the multiple and often conflicting pressures and beliefs that shaped religious belief and practice during

² Office of Archives Statistics and Research, 'Seventh-Day Adventist World Church Statistics', 2018.

³ That duality has caused tensions for some historians, particularly when their historical interpretation is seen as threatening to church orthodoxy. For example, see Jonathan Butler and Ronald Numbers, 'The Historian as Heretic', in *Prophetess of Health: A Study of Ellen White*, 2008.

the nineteenth-century, reaching beyond periods of upheaval such as the Second Great Awakening.

Ellen White: Religious Founder and Prophet

Ellen and her twin sister, Elizabeth, were born in November of 1827 to Robert and Eunice Harmon in Gorham, Maine. Members of the local Methodist church, the Harmon family was religiously active before William Miller arrived preaching his message of the second advent. White was a religiously sensitive child, “converted” at age eleven and baptized (by immersion on her request) into the Methodist Church at the age of twelve.⁴ Still, she felt that her salvation was incomplete. Upon hearing William Miller speak in 1840, she was full of concern that she was not ready for the second coming, not ready to “meet Jesus.”⁵ Her religious breakthrough came two years later in the form of being called to “pray in the public prayer-meeting,” a calling that she embraced with the support of her mother and Brother Stockman, the local Adventist preacher.⁶ At the moment of responding to that calling and praying aloud, White felt the “burden and agony of soul that I had so long felt left me, and the blessing of God came upon me like the gentle dew...”⁷ The experience solidified her commitment to the Adventist cause, at the expense of her status within the Methodist church: in 1843, when Ellen was fifteen

⁴ Ellen Gould Harmon White, *A Sketch of the Christian Experience and Views of Ellen G. White* (Saratoga Springs, NY: James White, 1851), p. 3; Ellen Gould Harmon White, *My Christian Experience, Views, and Labors*. (Battle Creek, MI: James White, 1860), p. 13

⁵ White, *A Sketch of the Christian Experience and Views of Ellen G. White*, p. 3.

⁶ Ellen Gould Harmon White, *A Sketch of the Christian Experience and Views of Ellen G. White*, p. 3-4.

⁷ Ellen Gould Harmon White, *A Sketch of the Christian Experience and Views of Ellen G. White*, p. 4. Stories of an irresistible call to public witness is common among female religious preachers during the nineteenth century, as documented by Elizabeth Grammer in Elizabeth Elkin Grammer, *Some Wild Visions: Autobiographies by Female Itinerant Evangelists in 19th-Century America* (Oxford University Press, 2003). The framing placed the onus of women’s religious activity on divine command, rather than individual volition, softening the social disruption implied in their embrace of that calling.

years old, she and her family were dismissed from the Methodist church on account of their Millerite beliefs.

White and her family spent 1843 and 1844 awaiting the second coming and were among those who experienced the Great Disappointment when the second coming did not occur on October 22, 1844. As the community attempted to understand what appeared to be the failure of prophecy, White experienced the first of many visions that would come to define her prophetic role for the nascent Seventh-day Adventist denomination. During prayer at a home gathering with five other Adventist women in December 1844, White had a vision of the temporal journey of the Adventist people. She saw

a straight and narrow path, cast up high above the world. On this path the Advent people were traveling to the city ... They had a bright light set up behind them at the first end of the path, which an angel told me was the Midnight Cry [Miller's teaching regarding the Second Advent] ... if they kept their eyes on Jesus, who was just before them, leading them to the city, they were safe.⁸

She and others interpreted this vision as a call to hold on to their belief in the Second Coming, as presented by Miller. With their embrace of Miller's teaching, the Advent community had begun the journey to heaven, of salvation, and that only by remaining faithful would they be saved.

White was again called to share this and subsequent visions with the Adventist community. She began traveling to the surrounding Adventist meetings, and eventually sent a written account of her vision to one of the remaining Adventist periodicals, the *Day-Star*.⁹ Her message was often met with skepticism and White found herself having to

⁸ White, *My Christian Experience, Views, and Labors*, p. 31.

⁹ Ellen G. Harmon, 'Letter from Sister Harmon', *The Day-Star* 9, nos. 7, 8 (1846): 31–32.

defend her calling against accusations of mesmerism and spiritualism.¹⁰ Further attesting to their legitimacy, her visions began to be marked by supernatural exhibitions of strength. While meeting with the Adventist community in Randolph, Massachusetts, White went into vision and, as a test, a large “quarto family Bible” was placed upon her and immediately she “arose to her feet, and walked into the middle of the room, with the Bible open in one hand, and lifted up as high as she could reach.” She began to turn to various passages, reciting without seeing their content, and continued this way until sunset.¹¹ Slowly, a growing number of the remaining Adventist community began to embrace White and her visions as of divine origin.

One of her early converts and fellow traveler was Millerite lecturer, James White. The two were married in 1847, in part for the sake of propriety, and continued to travel together to fulfill Ellen’s calling to share her visions. In 1849, they began a publication, *The Present Truth*, to better reach the scattered Adventist community. As I discuss in Chapters 1 and 2, this was the beginning of an expansive publication network that was foundational to the formation of the Seventh-day Adventist denomination. James and Ellen continued to travel, publishing from Middletown, Connecticut; Paris, Maine; Oswego, New York; Saratoga Springs, New York; and Rochester, New York, before settling in Battle Creek, Michigan in 1855-6.¹² During this time of travel and preaching, Ellen gave birth to three of the couple’s four sons, and offered guidance to the growing community through her visions and testimonies.

¹⁰ White, *My Christian Experience, Views, and Labors*, pp. 57; 72.

¹¹ Ellen Gould Harmon White, *My Christian Experience, Views, and Labors*, pp. 77-79. This story has become deeply embedded within the Adventist story, with examples of the bible included at the Ellen White Estate offices for view to religious “pilgrims.”

¹² *Ibid.*, 115, 116, 122, 143, 152, 160, 203.

In 1863, White embarked on a second phase of her prophetic role for the growing denomination as an advocate for health reform. Her approach to health incorporated a number of different threads of nineteenth-century society. Church members, including fellow leader Joseph Bates, had long advocated for abstaining from stimulants, such as tobacco, tea, and coffee, as well as for the adoption of the vegetarian diet and whole wheat flour of Grahamism.¹³ After having had success with water cure for treating her sons from diphtheria and a positive experience at James Caleb Jackson's water cure retreat in Danville, N.Y., "Our Home on the Hillside," White received visions directing the establishment of a Seventh-day Adventist water cure institution, which was founded in 1866.¹⁴ White wrote pieces on various aspects of health, including dress, sexuality, and diet, during the 1860s and 70s. Through her embrace of health reform, she worked to guide the Seventh-day Adventist community to follow the fullness of God's law, and to prepare themselves for salvation by attending to their physical health in this life.

After the death of James White in 1881, Ellen White entered a third phase of her role within the denomination, that of missionary, author, and "matriarch."¹⁵ She continued to travel on behalf of the cause, spending 1885-1887 in Europe and 1891-1900 in Australia, establishing the Seventh-day Adventist community there.¹⁶ She was increasingly an advocate for educational reform, writing about the benefits of practical

¹³ Ronald L. Numbers and Rennie B. Schoepflin, 'Science and Medicine', in *Ellen Harmon White: American Prophet*, ed. Terrie Dopp Aamodt, Gary Land, and Ronald L. Numbers, 2014, p. 198-9; Stephen Nissenbaum, *Sex, Diet, and Debility in Jacksonian America: Sylvester Graham and Health Reform* (Westport, Conn.: Greenwood Press, 1980), pp. 20-21.

¹⁴ Numbers and Schoepflin, 'Science and Medicine', p. 204; Ronald L. Numbers, *Prophetess of Health: A Study of Ellen G. White* (Wm. B. Eerdmans Publishing Co., 2008), pp. 124, 126-132.

¹⁵ Jonathan Butler, 'Ellen White: A Portrait', in *Ellen Harmon White: American Prophet*, ed. Terrie Dopp Aamodt, Gary Land, and Ronald L. Numbers, 2014, p. 17.

¹⁶ Jonathan Butler, 'Ellen White', pp. 17; 21.

education that combined religious instruction, physical labor, and skills training, as well as for the expansion of the health reform work of the denomination. She also gathered a literary staff around her to aid in the work of recording and distributing her visions in print. Throughout this period of activity, White grew into her role as the matriarch of the denomination, weighing in on theological controversies, dictating the educational model for the growing network of Seventh-day Adventist schools, and recommending locations for the establishment of new sanitariums.

The final years of her life were spent overseeing a final reorganization and consolidation of the denomination as well as attending to her literary legacy. Upon her return from Australia, she pushed for the reorganization of the denomination and its institutions, including moving the denominational headquarters out of Battle Creek, Michigan to the Washington, D.C., region. She challenged John Harvey Kellogg's functional monopoly over the denomination's medical missions, encouraged the development of sanitariums outside of Battle Creek, and personally oversaw the site selection for the Loma Linda sanitarium, as well as other Southern California institutions.¹⁷ From her final home in St. Helena, California, White focused on the management and publication of her writings. She established an estate to ensure that her works continued to be published and appointed trustees that included both family and church leaders to administer it after her death.¹⁸ When she died in 1915, she was held by

¹⁷ Jonathan Butler, 'Ellen White', pp. 22-23.

¹⁸ Paul McGraw and Gilbert Valentine, 'Legacy', in *Ellen Harmon White: American Prophet*, 2014, p. 306-7.

most church members as their divinely inspired leader and her writings second only to the Bible in providing access to the divine.

Through all the changes that structured her life, White maintained her prophetic role, publishing “Testimonies” for the church that covered topics from theology and health to commentary on the behavior of individual ministers (and their wives) and serving as a conduit for divine guidance when the way forward for the denomination was unclear. She also served, through her example and her writings, as an advocate for the importance of women’s labor as part of the missionary activity of the church. Whether in the form of offering testimony to the truth of the “third angels’ message,” training children in self-control through diet, working in the church’s medical institutions, supporting the organization of the denomination, or participating in global missions, all aspects of religious work were presented as open to women, even if their work was constrained. While she assumed her most radical role — that of prophet — in the opening years of the movement, she continued to widen the sphere of influence for both herself and the women of the denomination over the course of her long life.

Interpreting Ellen White’s Role in Shaping the Culture of Seventh-day Adventism

Ellen White rose to prominence during the period of the Second Great Awakening, a period of particularly intense renegotiation of the religious norms in the United States. As a result, her role in Seventh-day Adventism is often explained with reference to the patterns and shifts that defined that period. As I discuss in the first chapter, the early nineteenth-century was a period in American history marked by religious innovation. The separation of religion from state control, a process known as

disestablishment, created an environment particularly ripe for a “democratization” of religious expression.¹⁹ People were increasingly able to worship according to their preferences and outside of the established denominations. The loosening of social controls on religious expression resulted in increasing diversity, as new churches, denominations, and movements formed in response to differences in religious thought and practice. Out of this period of religious innovation came some of the most distinctive American religious and social movements, including the Church of Jesus Christ of Latter-day Saints, the Oneida Utopian Community, and the Seventh-day Adventists.²⁰

The decentralization of control, however, is not sufficient to explain the rapid proliferation of new religious movements, each claiming to present the truth that others were failing to uphold. Looking more closely at religious revival and reform movements, it becomes clear that these religious actors were guided by particular visions of sacred history, by particular understandings of the arc of history and the role of American Protestant Christians in that narrative. While each group understood itself as standing at the crux of the story of salvation, all shared a framework that “began in Eden, developed in the world, and would culminate in a world without end.” The narrative was radically expansive, encompassing “humankind — saints and sinners, men and women, common and chosen ...” along with “the suprahuman character of God Himself, His son the

¹⁹ The seminal work on the changing character of American religion in the years after the American Revolution remains Nathan O Hatch, *The Democratization of American Christianity* (New Haven: Yale University Press, 1989).

²⁰ For a study of the parallels between Mormonism and Oneida, see Lawrence Foster, *Women, Family, and Utopia: Communal Experiments of the Shakers, the Oneida Community, and the Mormons* (Syracuse, NY: Syracuse University Press, 1991). For a comparison of Seventh-day Adventism and the Shakers, see Lawrence Foster, ‘Has Prophecy Failed? Contrasting Perspectives of the Millerites and Shakers’, in *The Disappointed*, ed. Ronald L. Numbers and Jonathan M. Butler (Indiana University Press, 1987).

Christ, and the sworn enemy — the Antichrist.”²¹ In the march toward the last judgment, each group identified itself as the chosen one whose members successfully understood and obeyed the requirements for salvation, whether those requirements were correct behavior or the proper religious experience to ensure a connection with and the favor of the Divine. For many, that position also required bringing about change in the world, either by converting souls through revivals or by advocating for virtuous living. These various groups saw themselves as having a divine mission to prepare the world for the coming end and to do their part to ensure that events unfolded according to the Divine plan.

Protestant women as well as men embraced these various efforts to redeem the world ahead of the imminent return of Christ. As has been noted by historian Ann Braude and others, religion in the American context has always been a site of significant female activity.²² Although leadership positions have been restricted to male adherents across most American religious traditions, women have consistently contributed both time and money to religious initiatives, worked to train children within religious traditions, and constituted the majority of those who attend religious services.²³ Building on the existing predominance of religious women, the Protestant reform movements of the early nineteenth-century called upon women to help bring about revival and reform. As Carroll Smith-Rosenberg has noted, although these movements were generally led by “male

²¹ Robert H. Abzug, *Cosmos Crumbling: American Reform and the Religious Imagination* (Oxford University Press, 1994), p. 30. Abzug focuses primarily on the religious imagination of New England Puritans, but this general framework can be expanded to nearly all Protestant or Protestant based religious movements of the period.

²² Ann Braude, ‘Women’s History Is Religious History’, in *Retelling U.s. Religious History*, ed. Thomas A. Tweed (University of California Press, 1997).

²³ Ann Braude, ‘Women’s History Is Religious History’, p. 89.

clerics and reformers ... women were their most zealous adherents.”²⁴ In addition to joining radical religious movements, women worked for reform in a variety of ways, including fundraising for various causes, creating female benevolent societies, and taking to the pulpit, preaching to convince others to repent for the kingdom of heaven was at hand. Through all these efforts, women created “a public and powerful role for themselves as a female conscience and moral voice crying in a wilderness of male corruption” during the same period that domesticity and “the Cult of True Womanhood” grew in cultural prominence.²⁵

Radical religious movements attracted the involvement of women and presented opportunities for them to claim leadership roles that had previously been denied. Sociologists and historians have linked periods of revival and radical religion, or periods of “religious anti-ritualism,” to social and economic change and distress, when social “boundaries are no longer clearly defined.”²⁶ Revivals, as “liminal” periods, provided space for the reconfiguration of social norms and structures, enabling women and others traditionally excluded from leadership roles to experiment with different constructions

²⁴ Carroll Smith-Rosenberg, ‘The Cross and the Pedestal: Women, Anti-Ritualism, and the Emergence of the American Bourgeoisie’, in *Disorderly Conduct: Visions of Gender in Victorian America* (Oxford University Press, 1986), p. 129.

²⁵ Carroll Smith-Rosenberg, ‘The Cross and the Pedestal’, p. 130. Phrase from Barbara Welter’s classic article of the same title. Barbara Welter. “The Cult of True Womanhood: 1820-1860.” *American Quarterly* 18, no. 2 (1966): 151--74.

²⁶ Carroll Smith-Rosenberg, ‘The Cross and the Pedestal’, p. 140. Smith-Rosenberg applies this framework from anthropologist Mary Douglas to the religious revivals of the early nineteenth-century. Additional scholars who have relied on a similar parsing of religious revival include William McLoughlin and Paul Johnson. William G. McLoughlin, *Revivals, Awakening and Reform: An Essay on Religious and Social Change in America, 1607-1977* (University of Chicago Press, 2013); Paul E. Johnson, *A Shopkeeper’s Millennium: Society and Revivals in Rochester, New York, 1815-1837* (New York: Hill and Wang, 2004).

and in so doing, shift the shape of the social spheres.²⁷ For the revivals of the Second Great Awakening, the social reorganization launched with the American Revolution and the instability of society brought about with increased mobility and the loosening of government control on the expression of religion created the environment in which groups traditionally excluded - those without formal religious training, women, and ethnic minorities - could experiment with alternative forms of religious belief and practice.

The main studies that have focused on gender in Seventh-day Adventism or Ellen White and the formation of the denomination have relied on the framework of opportunities for innovation caused by social or economic disruption and have framed the church's development in terms of the movement from sect to denomination. In her study of gender in Seventh-day Adventism, Laura Vance turns to "sectarian development" as the theoretical framework for interpreting the changing attitudes regarding gender. She traces the progression of the denomination from "sect" — where members "despised secular involvement and found a collective identity in repudiating the world — to "denomination," focusing on the embrace of institution building and, after the second world war, efforts to de-emphasize their differences with other Protestant denominations.²⁸ Similarly, in his account of the development of the denomination, Jonathan Butler uses anthropologist Kenneth Burridge's formulation of "'old rules' to 'no rules' to 'new rules'" to explain the changes in Seventh-day Adventist culture and the

²⁷ Victor Turner, 'Betwixt and Between: The Liminal Period in *Rites de Passage*', in *The Forest of Symbols: Aspects of Ndembu Ritual* (Ithaca: Cornell University Press, 1967), 93–111.

²⁸ Laura Lee Vance, *Seventh-Day Adventism in Crisis: Gender and Sectarian Change in an Emerging Religion* (University of Illinois Press, 1999), pp. 222-3.

progression from a Millerite sect to a flourishing denomination.²⁹ These frameworks help illuminate the changes in Seventh-day Adventism from the Millerite days of 1844 to the present. “Sectarian development” provides a means to interpret the overall development of the movement, while Burridge’s formulation, similar to Douglas’ “anti-ritualism,” provides a window on particular moments of change.

While focusing on the movement from disruption to reification provides a useful framework for interpreting individual periods of revival or reform, the changing attitudes toward gender within Seventh-day Adventism, and as articulated by Ellen White, calls for bringing together these two frameworks to explore changes across multiple periods of disruption. Despite the move toward institutionalization and the concurrent restriction of roles for women, Ellen White maintained her prophetic leadership within the denomination and also articulated a vision of salvation that required the labor of women, both at home and in the world. Using computational text analysis, I argue that the cycles of end-times expectation during the first seventy years of the denomination’s history reinforced the denomination’s alternative sense of time as well as their alternative gender norms, as articulated by White and others. These cycles of increasing and decreasing expectation created recurring periods of “anti-ritualism” over the formative years of the denomination, which in turn influenced the culture that was institutionalized. Rather than a puzzle, these cycles enabled Ellen White to articulate a vision of gender and salvation that called both men and women to the work of salvation, whether that work be within the family or in bringing the Seventh-day Adventist message to the world.

²⁹ Jonathan Butler, ‘From Millerism to Seventh-Day Adventism: “Boundlessness to Consolidation”’, *Church History* 55, no. 1 (1986): 50–64, p. 50.

From Religious History to Digital History

Reaching beyond the religious culture at the beginning of Seventh-day Adventism to studying the unfolding of White's legacy over the course of her life presents the opportunity to investigate the use of computational text analysis in historical research. Due to the unique role of print in the formation of the denomination, the expansive published record of the denomination, which includes weekly and monthly periodicals, tracts, books, hymnals, and cookbooks, raises a challenge of scale. Tracking patterns across the published record over the 70 years of White's leadership poses a significant "problem of abundance."³⁰ Previous studies have addressed this challenge through sampling or by limiting focus to the main denominational periodical, *The Advent Review and Sabbath Herald*.³¹ Computational text analysis opens new avenues, enabling the identification of patterns in word usage at scale and tracking them over time.

Additionally, the question of time in the formation of the culture of Seventh-day Adventism raises important questions about the assumptions underlying modern text analysis algorithms and the process of leveraging those algorithms in historical research. How might researchers use tools that assume time is regular and linear to explore cultures that operate based on different concepts of time, different temporal imaginaries? How might those algorithms be adjusted for different models of time?

³⁰ To borrow a phrase from Roy Rosenzweig. Roy Rosenzweig, 'Scarcity or Abundance? Preserving the Past in a Digital Era', *The American Historical Review* 108, no. 3 (2003): 735–62

³¹ Vance, for example, primarily relies on the *Review and Herald*, which according to one reviewer limits the nuance of her analysis of denominational attitudes toward gender. Rennie B. Schoepflin, 'Review: "Seventh-Day Adventism in Crisis: Gender and Sectarian Change in an Emerging Religion by Laura L. Vance', *Church History* 72, no. 4 (2003): 908–9.

The study of time in Seventh-day Adventism presents a unique opportunity to use computational methods to further explore religious culture and to use religious culture to further explore the possibilities and limitations of computational research in the humanities. This bi-directional approach is at the heart of work in the digital humanities and enables interventions in both our understanding of the past and in our understanding of the meaning-making methods of the present.

A Culture Of and Through Print

Of the many changes that transformed American life in the nineteenth-century, the expansion of the means and networks of communication looms large. As the expanding nation was increasingly connected through railroads and telegraph, the decrease in transportation time and the increasing ease of producing and distributing information aided the growth of religious and political communities despite growing spatial distances. Using print to develop an “imagined community” that spanned both time and space, politicians, reformers, and religious leaders leveraged newspapers and other regular publications to share ideas, unite followers, and support dispersed communities. For religious publishers, the flourishing of religious print enabled preachers and others to “impart a sense of coherence and direction to widely scattered congregations” and in so doing provided the mechanism for the formation of new national religious movements.³² For the readers of religious periodicals of all stripes, the

³² Hatch, *The Democratization of American Christianity*, p. 146; Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London; New York: Verso, 2006), p. 6.

ritual of reading, sharing, and writing helped to create a “sense of interconnection,” of belonging and shared understanding, as fellow travelers along the road.³³

The history of the Seventh-day Adventist denomination provides a particularly potent example of the use of print to create and sustain a religious movement. For the early adherents, circulation of periodical literature was the primary mechanism by which the denomination developed its self-understanding and formed community. While these processes were aided by camp meetings and weekly services, the centrality of print in the missionary work of the denomination and importance of correspondence to the community through the periodicals point to the integral role of print as the “tie that binds” the community together.³⁴

From the beginning of the religious movement, the leaders of Seventh-day Adventism embraced publishing as the foundation of the religious activities of the denomination, as James and Ellen White turned to print to unite the “scattered flock.” In this, Seventh-day Adventists were similar to their religious and reform-minded peers, using the growing infrastructure of transportation and communication to spread their ideas and create a community through print. What is notable about Seventh-day Adventist publishing is how central it was, and remains, to their religious practice. Unlike other Protestant traditions, such as the Baptists, which center on the local congregation, the Seventh-day Adventists created a dispersed but centrally guided religious movement.

³³ Candy Gunther Brown, *Word in the World : Evangelical Writing, Publishing, and Reading in America, 1789-1880*, 2004, p. 271.

³⁴ John Fawcett, ‘Blest Be the Tie That Binds’, 1782. The hymn was published in Adventist hymnals starting with *The Advent Harp* in 1849. http://hymnary.org/text/blest_be_the_tie_that_binds.

Using regular publications to bridge gaps of space and time, Seventh-day Adventism developed their religious culture around print as a primary medium of communication.

Through that reliance on the printed materials for the denomination, the distribution of SDA literature took on additional significance as a way for lay community members to contribute to the mission of the denomination. From the earliest days of James' publishing of the *Present Truth* and asking for help with its distribution, sharing the Adventist understanding of the "third angel's message" has been central to the mission of the religious movement. Distributing Adventist literature, or serving as a "colporteur," was a key way for lay members of the denomination to become involved in the work of the church. Church members were (and still are) encouraged to hand out literature to friends, neighbors, and acquaintances as a way of engaging in evangelism.

Computational Analysis of Religious History

The question of Ellen White's role in the development of Seventh-day Adventism is particularly suited to computational methods due to the denomination's embrace of digital technologies. Their long-standing connection between faith, mission, and publishing has extended into the digital age, as the SDA has, with an expansiveness undertaken by few other denominations, devoted resources to creating and releasing digital copies and editions of their history. Recently these efforts have been consolidated in the Adventist Digital Library <<https://www.adventistdigitallibrary.org/>>, a central website with content contributed from a range of Seventh-day Adventist schools and archives, along with the General Conference of the denomination and the Ellen White Estate. This site, together with the denomination's Office of Archives, Statistics, and

Research <<http://documents.adventistarchives.org/default.aspx>> and Ellen White's Writings Online <<https://egwwritings.org/>>, provides access to the published and archival history of the denomination. With a mission of helping to “spread the gospel of Jesus Christ to the world through direct and unlimited access to Adventist historical materials, as well as current resources available within copyright boundaries,” the digital library and the digitization efforts of members of the denomination translate the denomination’s emphasis on print for the twenty-first century.³⁵

As a result of these efforts, large swaths of the denominations published record are available in digital formats. This creates both challenges and opportunities. With the weekly publication of the central denominational periodical, *The Advent Review and Sabbath Herald*, and separate titles for the different associations and regional conferences of the denomination, the scope of content produced by the denomination is too large for a single researcher to develop a comprehensive understanding of the different themes over time. This abundance, however, opens the need and opportunity for turning to computational methods, as the problem of abundance requires quickly sorting large quantities of textual data, the very problem that algorithms such as topic modeling were created to solve.³⁶ With the large scope and scale of digital content from the Seventh-day Adventist denomination, computational methods become necessary for exploring questions of the changing discourse of the denomination over time.

The abundance of the digital record for Seventh-day Adventism also creates the opportunity to examine some of the unstated assumptions within digital humanities. One

³⁵ ‘About’, *Adventist Digital Library*, 2017.

³⁶ David M. Blei, ‘Probabilistic Topic Models’, *Communications of the ACM* 55, no. 4 (2012): 77–84.

of these is that the biggest limiting factor for computational analysis is the availability of digital content. When digitized content is highly available, it can be productively subjected to different computational algorithms. I argue in Chapter 2 that this is not necessarily the case. Rather the quality of the textual data has a significant, and under-examined, effect on the results of different forms of computational analysis and that the textual data generated from historical documents is frequently unreliable. While computational strategies, such as Optical Character Recognition (OCR), are necessary to create textual data at scale from historical documents, significant work is needed to evaluate and prepare that data prior to analysis, work that is rarely rewarded as the scholarly output it is.

Studying the history of the SDA also brings to focus the challenge of using computational methods trained on modern data and structured according to modern assumptions on historical texts. The varying quality of the textual data creates challenges in applying some of the more advanced, and informative, natural language processing algorithms to historical content. For example, processes such as part of speech tagging require that the sentence structure remain intact, which often is not the case with the OCR of historical newspapers due to older patterns in layout and typography. Additionally, named entity recognition, which would be a powerful tool for parsing people and places, works best when the algorithm has been trained on similar content. Attempting to apply these strategies to the periodical literature of the denomination indicates that more work is needed in evaluating and training existing algorithms to work with historical content.

Additionally, the question of time in the construction of gender draws attention to the assumptions underlying computational algorithms, assumptions that humanities research is well positioned to interrogate. Time in our modern imaginary is understood to be constant, regular, progressive, and linear, but time has not been perceived the same way across history and cultures. Rather, the organization of time reflects and shapes social and cultural systems; time is “a plastic changeable notion, a social creation.”³⁷ When modeled within standard computational algorithms, time is generally assumed to be progressive, regular, and linear, or assumed to be a non-factor in the analysis.³⁸ This can have drastic effects on the patterns that the algorithm suggests, and obscure historical and cultural variations in the organization of time, as well as the effects of those alternative constructions on the topic of study. The question of Seventh-day Adventism’s beliefs about and alternative organizations of time creates space to explore if and how time can be examined using existing computational algorithms and opens space for exploring the construction of alternative algorithms that model time differently.

As with many Christian traditions, the printed word held a central place in the religious life and thought of early Seventh-day Adventism. While the printed record is generally of value to historians as a source for understanding the past, in the case of Seventh-day Adventism, it is a particularly potent source, a distributed and periodic

³⁷ Michael O’Malley, *Keeping Watch: A History of American Time* (New York: Penguin Books, 1990), p. 312. David Harvey pursues a similar argument in his work on historical geography, arguing for economic disruption as the root of shifts in the organization of space and time. David Harvey, ‘Between Space and Time: Reflections on the Geographical Imagination’, *Annals of the Association of American Geographers* 80, no. 3 (1990): 418–34. While certainly tied to economic realities, I argue here for the importance of beliefs in the construction of time, and the role of time in the possibilities for gender within a culture.

³⁸ For a detailed discussion of time in topic modeling algorithms, see Benjamin M. Schmidt, ‘Words Alone: Dismantling Topic Models in the Humanities’, *Journal of Digital Humanities*, 2013.

“scripture” deployed with good effect to share their distinctive message with the world and as a means of creating and sustaining their community. It is because of that centrality of text to the denomination, and their ongoing commitment to making their textual history accessible across multiple media, that the periodicals of the denomination can serve as the basis for a computational analysis of the development of Seventh-day Adventist beliefs and culture.

View the Introduction online at <http://dissertation.jeriwieringa.com/introduction/>.

THE STRUCTURE OF *A GOSPEL OF HEALTH AND SALVATION*

Making the bi-directional argument of the dissertation required that I use a different medium than print. Books, and historical monographs in particular, operate according to genre conventions that encourage linear narrative development. Web documents, by contrast, operate according to different conventions — such as hyperlinking, interactivity, and layering — that create space for different kinds of argumentation. Because I am pursuing two inter-related arguments in this dissertation, and relying on data, code, and interactive visualizations to make those arguments, the conventions of web documents are a better fit for this work.

For readability, the dissertation website does mirror some of the conventions of print dissertations. The main content of the dissertation is structured into four chapters, an introduction, conclusion, and the traditional supporting text of a bibliography and acknowledgments. However, although the chapters of this dissertation build sequentially, unlike a traditional narrative history, they are not structured to move forward through time or to unfold as a story. Rather, each chapter provides a different aspect of the overall analysis.

Additionally, the dissertation leverages the conventions of web documents to expose and connect the layers that make up the analysis of the dissertation. The site contains a collection of code notebooks that document the computational work behind the

interpretive analysis as well as an interactive “browser” that provides access to the topic model at the heart of the dissertation. These components are linked to within the essays to expose the underlying computational analysis or can be explored independently for readers interested primarily in the methodological argument of the dissertation.

As this dissertation relies on different conventions than traditional narrative texts, the interfaces require some explanation. The dissertation can be read in a number of ways. First, it can be read according to either of the two tracks identified on the website home page: “Ellen White and Gender in Seventh-day Adventism” for readers interested in the historical interpretation or “Computational Methods in History” for readers interested in the methodological arguments of the dissertation. Additionally, the project can be read according to the links in the top navigation, which guide the reader from the topic model browser, to the essays, code, and conclusion. Each of these elements is introduced below to explain how the pieces fit within the overall argument of the dissertation.

Topic Model Browser

At the core of the project is the topic model browser of the SDA literature, accessible at <http://browser.dissertation.jeriwieringa.com>. This model, built using MALLET and visualized using Andrew Goldstone’s [DfR Browser](https://agoldst.github.io/dfr-browser/) <<https://agoldst.github.io/dfr-browser/>>, provides a window on the language used across the corpus of Seventh-day Adventist texts that I assembled. The interface is organized according to my interpretation of those topics, as reflected in the topic labels. I discuss my interpretive process for creating the labels in Chapter 3.

Essays

The four chapters that make up the primary text of the dissertation establish the context for and interpret the data from the topic model. These chapters build on one another and together offer the argument of the dissertation in a more traditional narrative form.

The first chapter, “The Emergence of Seventh-day Adventism,” [<http://dissertation.jeriwieringa.com/essays/chapter-1/>](http://dissertation.jeriwieringa.com/essays/chapter-1/) provides an overview of Seventh-day Adventism in light of standard accounts of nineteenth-century religion and culture. This chapter situates the denomination historically, tracing their roots in the Second Great Awakening and William Miller’s predictions of the second coming as well as providing an overview of their distinctive theological and cultural features in relation to their development from a “sect” to a “denomination.”

The second chapter, “Constructing Computational Models from Historical Texts,” [<http://dissertation.jeriwieringa.com/essays/chapter-2/>](http://dissertation.jeriwieringa.com/essays/chapter-2/) provides methodological arguments for the sourcing, processing, modeling, and visualization aspects of the project. This chapter is the most technical in content, tying the computational work to the historical interpretation.

The third chapter, “Anticipating the End of Time,” [<http://dissertation.jeriwieringa.com/essays/chapter-3/>](http://dissertation.jeriwieringa.com/essays/chapter-3/) establishes the problem of time within early Seventh-day Adventism. A case study on using topic models to identify and reveal overarching trends in a corpus for historical analysis, I trace the prevalence of

“end-times” topics over time. The study reveals three main cycles of end-times expectation that shaped the cultural development of the denomination.

The fourth and final chapter, “The Gendered Work of Salvation at the End of Time,” <<http://dissertation.jeriwieringa.com/essays/chapter-4/>> builds on the structure of time identified in chapter three to argue that the belief in the impending end of time created space for the development of a culture that was in tension with surrounding norms. The nearness of the second coming necessitated that men and women cooperate in the work of salvation, both within the home and in the missionary activities of the church, resulting in an expansive understanding of gender within the denomination.

Notebooks

As a project based on the computational analysis of text, a large portion of the intellectual and scholarly work that makes up the dissertation exists in code. In considering the methodological processes around the use of computational analysis in history, this dissertation makes the claim, both explicitly and implicitly, that this technical work is of central importance to the scholarly object of the dissertation. It does this through the inclusion of code and data files in a collection of notebooks <<http://dissertation.jeriwieringa.com/notebooks/notebooks-overview/>>, which document the computational work that went into creating and interpreting the topic model.

Where traditional methods of review rely on the use of clear and well formatted footnotes so that the trail of evidence can be retraced and evaluated, the review of computational work requires the use of documented and accessible code, so that both the execution of the techniques and the assumptions embedded within the technical choices

can be seen and evaluated. The code elements can be viewed through the dissertation's web interface or can be downloaded and run for verification or for adaptation to other projects. The work of making the technical elements of the dissertation visible and extensible is key to establishing processes for validating computationally-based scholarship in the humanities.

About: Process Statement and Bibliography

The final elements of the dissertation are the process statement [<http://dissertation.jeriwieringa.com/about/>](http://dissertation.jeriwieringa.com/about/) and bibliography [<http://dissertation.jeriwieringa.com/bibliography/biblio-main/>](http://dissertation.jeriwieringa.com/bibliography/biblio-main/). Following the requirements of the Department of History and Art History at George Mason University [<http://historyarthistory.gmu.edu/graduate/phd-history/digital-dissertation-guidelines/>](http://historyarthistory.gmu.edu/graduate/phd-history/digital-dissertation-guidelines/), I provide an account of the methods and technologies used in the creation of the dissertation in the process statement, including the final websites, the modeling algorithms, and the dissertation sources. The bibliography lists the primary and secondary sources, as well as the computational tools used in the dissertation. This includes a full listing of the periodical issues used to create the topic model. Together, all of these aspects of the project constitute the body of work that is *A Gospel of Health and Salvation*.

View the Structural Overview online at <http://dissertation.jeriwieringa.com/structure/>.

TOPIC MODEL BROWSER

At the core of the dissertation is a 250-topic model of the periodical literature of the Seventh-day Adventist denomination. As I discuss throughout the dissertation, topic modeling is a form of unsupervised machine learning that enables the exploration of a corpus of literature based on the co-occurrence of words, clustered into units called “topics.” While for the computer, the topics represent the likelihood of word occurrences in different contexts, for the human reader topics can be used to track different themes or discourses within a corpus. The model provides a useful abstraction of a corpus of literature, highlighting different features within a collection of texts.

For this project, I used the DfR Browser, created by Andrew Goldstone [<http://agoldst.github.io/dfr-browser/>](http://agoldst.github.io/dfr-browser/). While not the only topic model interface available, the DfR Browser has a number of advantages. First, structurally the browser is a static, single-page website, which reduces the complexity of hosting and archiving the work. Second, the browser provides a number of useful interfaces into the topic model data, enabling the reader to explore from the level of the overall model and corpus to the level of individual words. Third, the methods used by Goldstone to calculate topic weights over time are similar to those I use throughout the rest of the dissertation, computing the percentage of total tokens, or words, assigned to each topic in a given

year. This provides a consistent representation of the topics between the visualizations within the dissertation and the browser.

To aid use of the browser, I provide here an overview of the different “views” to help orient the reader and clarify the ways I anticipate the model being used.³⁹ These views are the model view, the topic view, the document view, and the word view. Each provides a different perspective on the tokens within the corpus of Seventh-day Adventist periodicals and can be used to explore different aspects of the model and of the periodicals over time.

Model View

The landing page of the model browser <http://browser.dissertation.jeriwieringa.com/#!/model> enables the user to view the overall structure of the topic model and provides four different views of all of the topics. The “Grid” view shows all the topics as circles, with the boundary widths indicating overall prominence, while the “Scaled” view (currently not functional) varies the size of the circles according to the prominence of the topic across the whole corpus. The “List” view shows the topics alphabetically with a chart of prevalence over time as well as overall proportion in the corpus and can be sorted along any of these columns. And finally, the “Stacked” view provides a steamgraph visualization of all of the topics, with the width corresponding to percentage, or total word counts, depending on the user selection.

³⁹ I provide details on the construction and computational use of the topic model within the dissertation and the dissertation notebooks.

The model view provides the user insight into the overall structure of the topic model. In these views, we can see that there is a large number of topics for the corpus, with both more generalized and focused topics. Because of the amount of data generated with this many topics, documents, and words, the model view provides suggestions of places for further inquiry but offers few clear suggestions of patterns in the overall corpus.

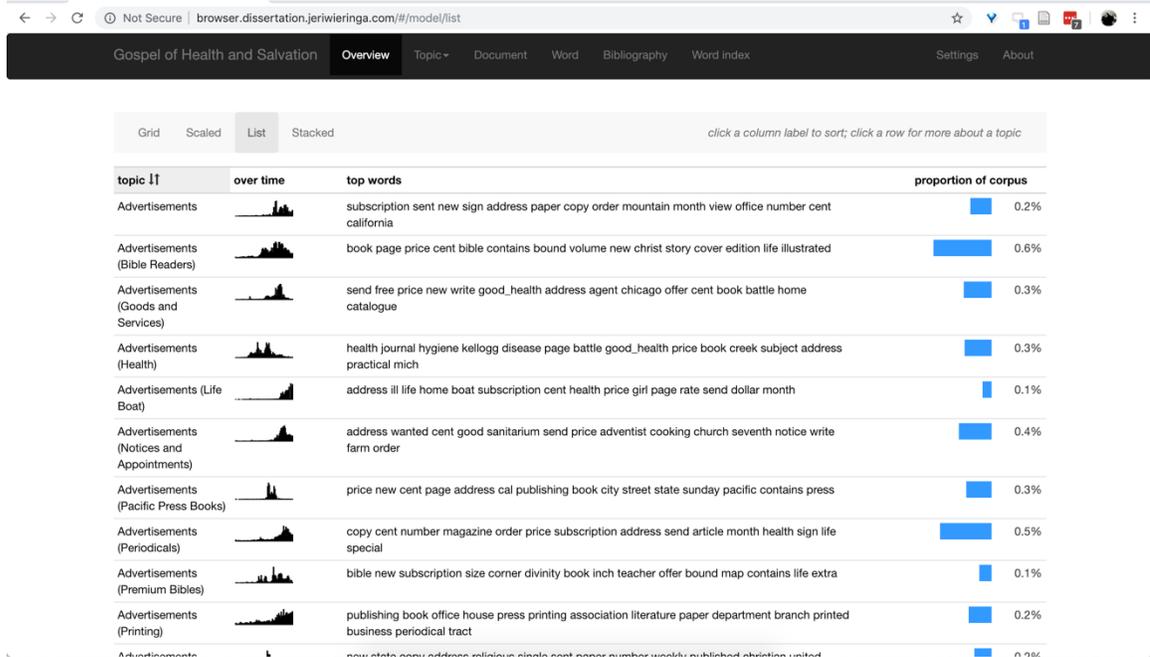


Figure 1 List view of all topics on browser landing page

Topic View

The topic view <http://browser.dissertation.jeriwieringa.com/#/topic/1> allows the user to explore each topic individually, showing the words that are most prominently associated with the topic, as well as the documents where the topic is most prevalent.

Additionally, when a user selects a year in the graph showing the “Conditional Probability of Words in Topic,” the top documents list updates to reveal the documents with the greatest prevalence of the topic in that year. These features enable the user to explore which areas of the corpus are most strongly associated with a particular topic. This information, combined with the graph of topics over time, helps illuminate the language patterns identified by the model. I used this information in assigning interpretive labels to the topic, reading the context from the top documents as well as exploring particular years, both with low and high overall prevalence, in order to further refine my understanding of the topics.

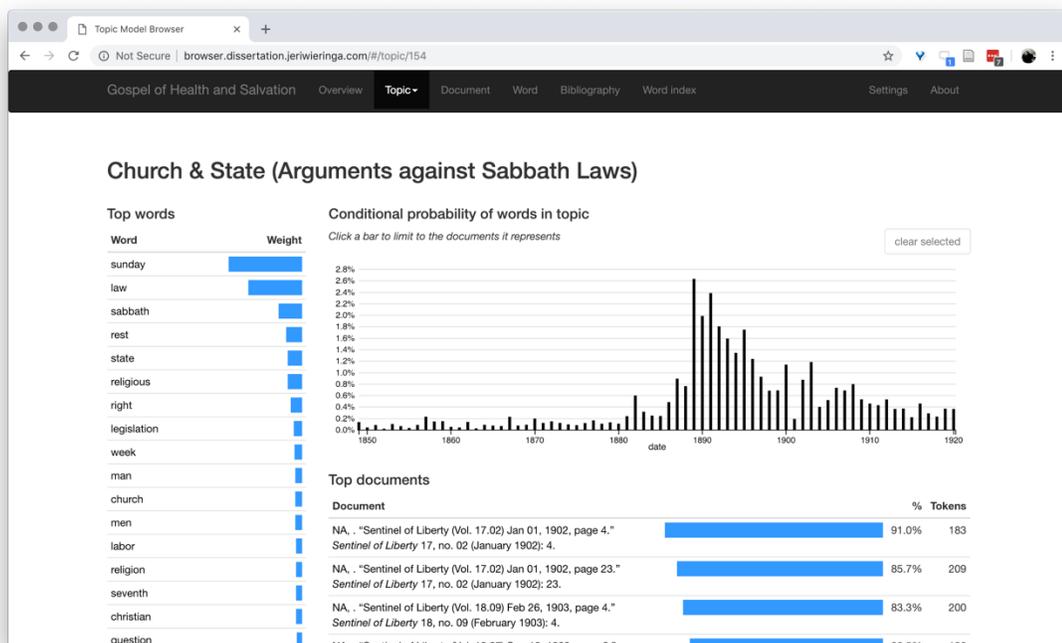


Figure 2 Topic view for topic number 153, identified as related to arguments regarding Sabbath Laws. View includes top words in the topic, distribution of the topic over time, and top 20 documents with tokens assigned to the topic.

Document View

The document view <<http://browser.dissertation.jeriwieringa.com/#/doc/1>> provides insight into how the topic modeling algorithm labeled the words within each document, showing each identified topic and the number and percentage of words associated with it. This breakdown of topic assignments provides a summary of the content of the document, indicating which general themes or discourses the document is likely engaged with. The view also provides some initial indication as to which topics might be linked to one another.

The document level view can also be used to begin to evaluate the performance of the topic modeling algorithm. In the case of the first document, linked above, the long list of identified topics, many with only one word associated with it, suggests that the topic model could be further refined by encouraging fewer topic assignments within documents.⁴⁰ Despite this weakness, the top three topics assigned to the document provide a good indication of the content, which features the personal testimony of the conversion experience of one of the students at Battle Creek College.

⁴⁰ For a technical introduction to the various parameters involved in creating and optimizing a topic model, see Hanna M. Wallach, David M. Mimno, and Andrew McCallum, *Rethinking Lda: Why Priors Matter*, vol. 22 (Curran Associates, Inc., 2009). See also the Appendix of Andrew Goldstone and Ted Underwood's essay in the *Journal of Digital Humanities*. Andrew Goldstone and Ted Underwood, 'What Can Topic Models of Pmla Teach Us About the History of Literary Scholarship?', *Journal of Digital Humanities* 2, no. 1 (2013).

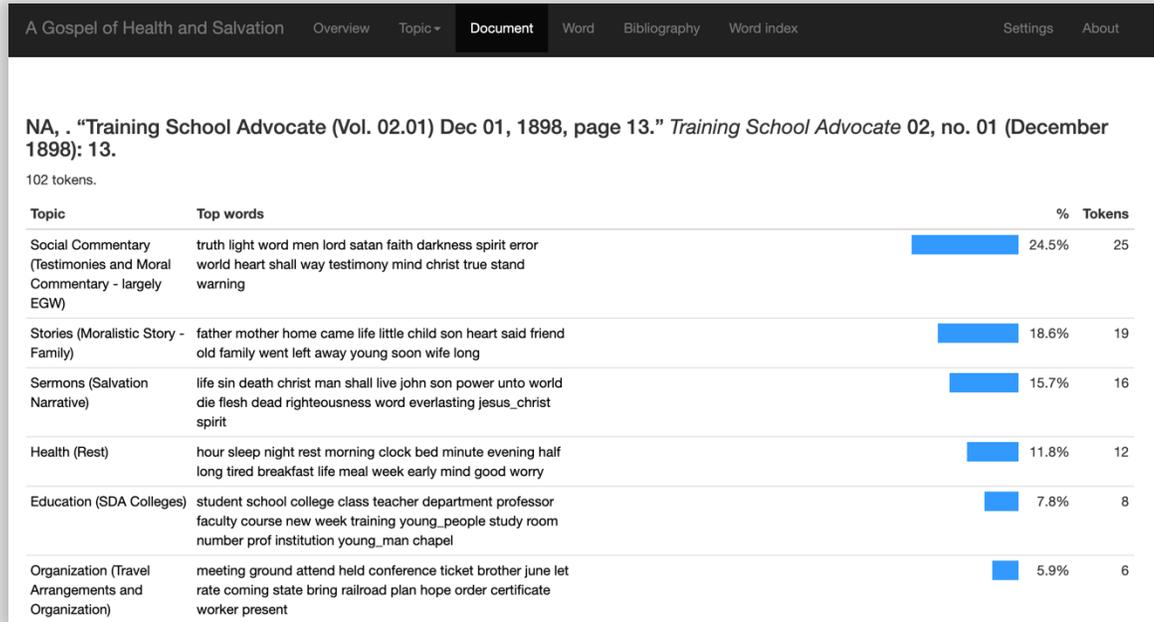


Figure 3 Document view showing the distribution of topics assigned to the words in the document.

Word View

The word view has two associated interfaces: the first shows all of the words that appear in the topic model browser <http://browser.dissertation.jeriwieringa.com/#!/words> and the second shows the topics in which individual words appear <http://browser.dissertation.jeriwieringa.com/#!/word/ability>. These two interfaces provide insight into the overall language use within the full set of documents, as well as the ways the topic model treated the individual words from the texts. The full list shows the most prominent words that appear in the corpus, providing a summary of the language of the denomination. The topic view for individual words reveals how words have been grouped by the algorithm, together with the interpretive label I assigned to that

cluster of language. This interface provides another way to engage the corpus, working from key words of interest through the associated topics to the documents.

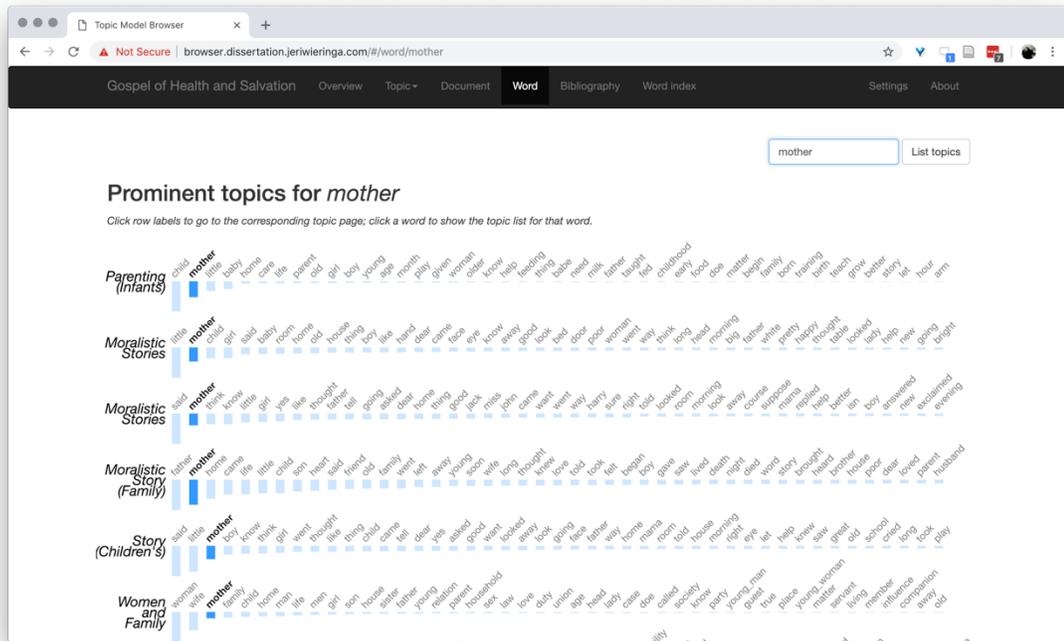


Figure 4 Document view showing the topic assignments for particular words.

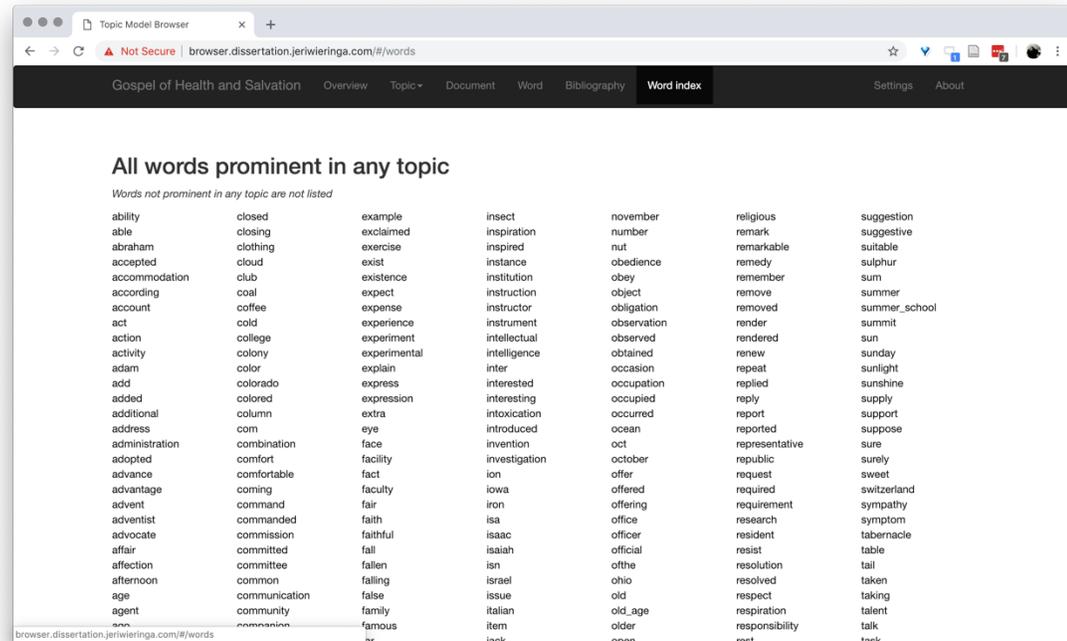


Figure 5 List of the most prominent words in the topic model.

Conclusion

The DfR Browser is well-designed to provide users with a high-level view of a topic model as well as the more detailed information needed for evaluating the strengths of the model and using the model to identify documents related to a subject of inquiry. The four views of the browser let users move back and forth between these different views of the corpus and its language, a key feature for putting the model to use in interpretive work. While not the only topic model browser under development, this approach has significant advantages for research work in humanities contexts, as it grounds the interface in the documents, rather than the model itself. Additionally, the

technical load of the browser is light, simplifying the processes involved in presenting and archiving the model interface.

My dissertation project has also brought to light some additional features that would enhance the browser for model exploration and interpretation. The default set up for the browser enables exploration of the topic model, but only limited manipulation of the model data. While the algorithm currently clusters topics based on time, enabling further grouping of documents and topics based on other metadata variables at the level of the user interface would enable additional exploration into the ways particular topics, or discourses are distributed by publication type or geographic region.⁴¹ Additionally, the inclusion of the document text within the document view, with the topic assignment of the words indicated, would provide further useful information on how the model has characterized the language of the document. Finally, a reporting mechanism that would enable returning a collection of documents that fit a particular set of parameters would expand the usefulness of the browser from the exploration of a model to leveraging the clustering work of the algorithm to identify related documents on a given topic.

A number of these changes push the interface beyond what can be achieved within a static site, as the memory load on the browser would become difficult to support. As such, it is also worth considering an adaptation of the browser that relies on a database for serving the corpus and model data. This modification would remove some of the advantages of the static-site approach but would make the browser a more robust tool for research.

⁴¹ The current version of the browser does enable some customization on this front during setup, but not such fluid manipulation on the user end.

Leveraging a topic model for historical research is a multifaceted problem, extending from the work of selection and preparation of a set of documents to the interfaces for interpreting and utilizing the resulting data. While experimental work in the digital humanities has focused largely on the process of running topic modeling algorithms on a set of documents, there is significant research to be done on the pre-processing and post-processing steps that make the running of the algorithm possible and legible. As both of these greatly shape the results of the computational analysis and its usefulness in historical research, they are vital areas for further scholarly attention from those working at the intersection of computation and the humanities.

View the Topic Model Browser at <http://browser.dissertation.jeriwieringa.com/>.

PROCESS STATEMENT: CREATING A DIGITAL DISSERTATION

The process for creating a narrative dissertation in history is, on the whole, well-established. A researcher chooses a topic of study, a theoretical framework (or two), identifies the relevant archives, spends years in those archives reading and analyzing the materials, and then uses that evidence to construct an account of a particular time, place, person, or event that had some influence on the development of culture, politics, and the like. Because the genre is well-defined, there is generally little attention paid to the process beyond the traditional acknowledgment in introductions and footnotes of the relevant theoretical frameworks and the consulted archival sources.

With the rise of digital technologies, many of the assumptions regarding the standard processes for archival research, analysis, and even publication are open to challenge and revision. Where the standard methodology for interpretation was reading and the application of theory and logic, computational algorithms enable new forms of analysis of data to ground interpretive claims.⁴² Additionally, the use of computers to process more traditional forms of historical evidence create new challenges for how that research is evaluated and extended. Where scholarly arguments based on interpretation could be evaluated through a rereading of the historical objects and a consideration of the

⁴² Tanya A. Clement, 'Where Is Methodology in Digital Humanities?', in *Debates in the Digital Humanities*, 2016 argues that for digital humanities to be situated "within a humanist epistemological framework" it "must also entail an explicit articulation of ... how our techniques are tied to theory." She notes that "the hermeneutical methods associated with reading," the default methodology in humanities studies, "remain largely unarticulated," which further complicates the work of introducing new methods.

logic of the initial interpretation, evaluating work that relies on computation requires engagement with the source code. A reader cannot adequately assess arguments where the author notes a source base and a general computational approach, since part of the logic of the analysis is embedded in the implementation and is only visible through the code.⁴³

Additionally, the very process of using computational tools in the analysis of historical data and the crafting of an interpretive narrative expands what has traditionally been considered the work of an individual scholar into a work that is more obviously a composite of the intellectual work of multiple authors.⁴⁴ Whereas the written dissertation weaves together evidence and theory with well-constructed prose in order to convince readers of a particular interpretation, digital work weaves together evidence, theory, software libraries, and display frameworks in creating the final result, where the software and display contribute intellectual work of their own in shaping the final product.

As a result of these concerns, the Department of History and Art History at George Mason University has included the requirement for a self-reflective process statement as part of digital dissertation projects submitted to the department. This statement, which follows, is required to give a “full accounting of the technical and analogue work that went into building the digital dissertation” as well as the “code and

⁴³ This problem of source code is one of the core elements of Da’s recent critiques of recent work in computational literary analysis. Nan Z. Da, ‘The Computational Case Against Computational Literary Studies’, *Critical Inquiry* 45, no. 3 (2019): 601–39. These concerns are not unique to history or the humanities. As computation and data science gain ground in the sciences as a mechanism for knowledge production, similar questions around reproducibility and code are increasingly of central concern.

⁴⁴ Whether that myth of the individual author has ever been true is another question, as all intellectual work relies on a robust intellectual community.

software employed to produce the final dissertation.”⁴⁵ This process of documenting the technical structure of the project aids in its evaluation as a complex and multi-layered work of scholarship. Much of the information found here is also documented throughout the dissertation itself, as part of my argument is that the technical elements are as much a part of the intellectual work of the dissertation as the more traditional narrative prose.⁴⁶ By providing an overview of the technical whole of the project in this space, readers can quickly orient themselves to the project.

The process statement provides a summary and accounting of the three primary layers of the dissertation: the data, the analysis, and the presentation interfaces. In it, I document the software used for developing each layer and provide the information necessary for running the different aspects of the project on a local machine. This provides a mechanism for future viewers to reconstruct the project should it cease to live online, to test elements as part of an evaluation of the work, or to extend parts of the project for other applications.

Data for Historical Analysis

As with any digital project, *A Gospel of Health and Salvation* is dependent on the availability of digital sources upon which to operate. Due to the SDA’s commitment to making their historical materials as widely available as possible, a large percentage of the denomination’s periodical literature has been digitized and is available through the church’s websites. At the time of writing, the periodical scans were hosted at [the Online](#)

⁴⁵ Department of History and Art History, ‘Digital Dissertation Guidelines’, 2019. <http://historyarthistory.gmu.edu/graduate/phd-history/digital-dissertation-guidelines>

⁴⁶ Additionally, traditional dissertations may also benefit from such statements, particularly as software makes complex computational processes easier for non-technical users and such work is incorporated into traditional narrative prose.

Archive <<http://documents.adventistarchives.org/Periodicals/Forms/AllFolders.aspx>> of the SDA's Office of Archives, Statistics, and Research. The files are also increasingly available through the Adventist Digital Library <<https://www.adventistdigitallibrary.org/>>, a compilation archive for a range of historic SDA materials. A full listing of the included periodicals, with links to the original PDF files, is included in the online bibliography.

In Chapter Two of the dissertation I describe the processes by which I selected, evaluated, and cleaned the textual data from the digital files. That work is also documented in the Gather <<http://dissertation.jeriwieringa.com/notebooks/1-Gather/readme-1/>>, Clean <<http://dissertation.jeriwieringa.com/notebooks/2-Clean/readme-2/>>, and Preprocess <<http://dissertation.jeriwieringa.com/notebooks/4-Preprocess/readme-4/>> Notebooks. I do not offer my own interface for accessing the digital files as part of this project, recommending instead that they be accessed and viewed through the infrastructure of the SDA. I can make the processed text that was used for the topic modeling phase available on request. However, that text should also be re-creatable using the original scans and the associated notebook files.

I used additional data sources to support the analysis of the periodicals. This included place and people names from the SDA's Yearbooks, place names from USGS, and third-party spelling lists. The data that I compiled or generated are available for download <<http://dissertation.jeriwieringa.com/notebooks/data/data>> through the site, while external data sources are documented in the online bibliography.

Computational Analysis

From automating the download of the denominational periodicals to visualizing the topic model, this project has relied on computational methods at each stage. The primary coding language for the project is Python, as documented in the included notebooks <<http://dissertation.jeriwieringa.com/notebooks/notebooks-overview/>> section of the dissertation. Additionally, I used AntConc <<https://www.laurenceanthony.net/software/antconc/>> for computing keyness values as part of my evaluation of the strength of the topic model, as I discuss in Chapter 3 <<http://dissertation.jeriwieringa.com/essays/chapter-3/>>. Other than the work in AntConc and my initial pass at downloading the PDF documents and extracting the text, all the computational pieces of the dissertation were done using Python libraries rather than desktop or online software so that the work could be easily documented and reproduced.

The topic model was created using Mallet <<http://mallet.cs.umass.edu/>> through the command-line interface, as documented in the Model <<http://dissertation.jeriwieringa.com/notebooks/5-Model/readme-5/>> notebook. Some preprocessing steps, such as connecting noun phrases and the creation of the stopword list were completed using Gensim <<https://radimrehurek.com/gensim/>>. I analyzed the model with Python, using the Pandas <<https://pandas.pydata.org/>>, Plotly <<https://plot.ly/python/>>, and pyLDAviz <<https://github.com/bmabey/pyLDAviz>> libraries for data analysis and visualization.

A list of the major software libraries utilized in this project is available in the bibliography.

Digital Interfaces

Selecting and developing the interfaces for the dissertation proved to be a challenge. While a single integrated application is the goal for future iterations of the project, the constraints of the dissertation resulted in my more modular approach to the different components of the project. There are four main interfaces for interacting with the dissertation. The first is the main project website, located at dissertation.jeriwieringa.com. The second is the topic model browser, located at browser.dissertation.jeriwieringa.com. The third is Jupyter Notebooks [<https://jupyter.org/>](https://jupyter.org/), which serves the dual functions of documenting the code used throughout the project and being an executable document, meaning that the provided notebook files can be used to execute the code locally. The final interface for the project is GitHub [<https://github.com/search?q=user%3Ajerielizabeth+dissertation>](https://github.com/search?q=user%3Ajerielizabeth+dissertation), with repositories for the main sites, the code notebooks, and a Python library I created for frequently used functions.

I created the main dissertation website using Nikola [<https://getnikola.com/>](https://getnikola.com/), a Python static site generator. This site generator enabled me to include a variety of different formats as part of the single project, including the notebook, html, markdown, and reStructuredText files. The default styling for the site uses the Bootstrap framework [<http://getbootstrap.com/>](http://getbootstrap.com/), which I have adapted. The notebook pages are included within the body of the dissertation in a static format — they can be viewed as last run but not executed. The notebook files rely on a Jupyter server to execute.

The main topic model browser is an application of Andrew Goldstone's Topic Model Browser <<https://github.com/agoldst/dfr-browser>>, which relies on D3.js <<https://d3js.org/>>. Using the output from MALLET and the scripts provided as part of the browser, I transformed the data so that it could be interacted with in this format. I manually created the labels for the topics, as I describe in Chapter 3 <<http://dissertation.jeriwieringa.com/essays/chapter-3/>>.

Finally, I captured a number of the more repeatedly used functions into a Python library for ease and stability of use. This library is necessary for testing the code included in the project notebooks and offers examples for adoption and extension in other contexts. It can be downloaded from GitHub <<https://github.com/jerielizabeth/text2topics>> and installed locally using pip, as described in the library README file.

Archiving and Reconstructing *A Gospel of Health and Salvation*

Submitting a project such as this as a dissertation raised a whole myriad of questions regarding how to use existing processes and platforms for complex digital objects. The current system for archiving dissertations at George Mason relies on the use of a DSpace repository, which is optimized for the collection and preservation of singular, preferably PDF, files. Additionally, the formatting requirements for dissertations assume a textual final product, one that can be created with Microsoft Word. For the submission and archiving of this dissertation, I chose to pursue a hybrid strategy. This essay, along with the introduction, website overviews, and bibliography, make up

the “dissertation object” for this project — the primary object that is properly formatted, cataloged, and archived in the repository.

For archiving and preserving the digital aspects of the project, I pursued a two-tiered strategy. First, to preserve the appearance of the project at the point of submission, I captured the web interfaces using Web Recorder <<https://webrecorder.io/>>, as well as submitted the sites to the Internet Archive <https://web.archive.org/web/*/dissertation.jeriwieringa.com>. This includes dissertation.jeriwieringa.com and browser.dissertation.jeriwieringa.com. These interfaces are preserved within .warc (WebARChive) files and are viewable through a web archive player. For capturing the code and data of the project, I archived the code and data files for the different dissertation components and documented the required software and versions for running the code. These files can be downloaded and run on a local machine to test different aspects of the project or to modify them for other uses. This approach captures both the reading experience of the digital dissertation, as well as its technical underpinnings. These collections are preserved in the George Mason University Archival Repository, MARS <<http://hdl.handle.net/1920/11562>>.

Reproducing the Research

The computational aspects of the dissertation are split into four components, two for computational processing, and two for presentation:

- Python Library - <https://github.com/jerielizabeth/text2topics>
- Jupyter Notebooks - <https://github.com/jerielizabeth/Gospel-of-Health-Notebooks>
- Website - <https://github.com/jerielizabeth/Gospel-of-Health-Website>

- Model Browser - <https://github.com/jerielizabeth/dfr-browser>

Because of this structure, there is some duplication of files between the repositories. I managed the moving of files using the DoIt Automation tool [<https://pydoit.org/>](https://pydoit.org/).

To recreate the computational work that underlies the dissertation, one will need three primary components:

- The periodical files from the Adventist Archives [<http://documents.adventistarchives.org/Periodicals/Forms/AllFolders.aspx>](http://documents.adventistarchives.org/Periodicals/Forms/AllFolders.aspx),⁴⁷
- The Python library [<https://github.com/jerielizabeth/text2topics>](https://github.com/jerielizabeth/text2topics) that contains my custom functions, and
- The Jupyter notebooks [<https://github.com/jerielizabeth/Gospel-of-Health-Notebooks>](https://github.com/jerielizabeth/Gospel-of-Health-Notebooks) that document my processes for processing the text files and the resulting data.

To run on a personal laptop, you will need Jupyter running locally and the supporting python libraries installed. Those libraries are documented in the environment.yml file in the Notebooks directory. The notebook files can also be uploaded to a third party Jupyter server, such as Microsoft Azure Notebooks [<https://notebooks.azure.com/>](https://notebooks.azure.com/) or Google Colaboratory [<https://colab.research.google.com/>](https://colab.research.google.com/), for users who do not wish to set up a local Jupyter server.

⁴⁷ A list of the titles I used for the dissertation is included in the bibliography of the project.

Together these components make it possible for the intellectual work of preparing and analyzing the text to be examined and duplicated.

Rebuilding the Websites

To recreate the website portions of the dissertation, one will need the files for both the main website and the model browser. The main website uses Nikola [<https://getnikola.com/>](https://getnikola.com/) to create html pages from a collection of markdown, restructured text, and notebook files. To run locally, use the `nikola serve` command from the root of the site directory.

The model browser is a single-page JavaScript application, built using D3.js. To run locally, run `/bin/server` from the root of the browser directory to launch a basic Python3 webserver.

Both sites require Python3. I recommend using a package and environment management system for running these elements locally. I used Miniconda [<https://docs.conda.io/projects/conda/en/latest/>](https://docs.conda.io/projects/conda/en/latest/) for the dissertation.

Technical Support

When I started working on the main part of the dissertation, my programming experience to date had been the two required digital history courses at George Mason University, an additional introduction to programming course, some hands-on experience in web development through my research assistantship at the Roy Rosenzweig Center for History and New Media [<https://rrchnm.org/>](https://rrchnm.org/), and a Rails Girls workshop [<http://railsgirls.com/>](http://railsgirls.com/). In retrospect, embarking on a technical project from that starting point was a bit over-ambitious. My initial design of the project included network analysis

from the denominational Yearbooks and geospatial analysis of people, publications, and ideas, along with text analysis. While I still think that these additional modes of analysis would help illuminate the development of this particular group of people, these ideas have been bracketed for future iterations of the project.

I have been overly committed in this project to doing my own computational work, both because I am committed to the idea that one needs to grapple with the assumptions and implementation of computational and historical analysis when bringing the two modes of inquiry together and because of the gender politics of the field. I am, however, deeply indebted to many people who have given their time and energy to help me understand and troubleshoot the technical aspects of this project. Chief among these are Fred Gibbs, the Experimental Humanities Group at the Iliff School of Theology, Lincoln Mullen, who consulted on the network analysis piece of the project that was unfortunately tabled due to time constraints, Amanda Regan, Taylor Arnold, and Lauren Tilton. The computational work in this project is primarily my own, aside from a myriad of snippets gleaned from StackOverflow <<https://stackoverflow.com/>> and the libraries and resources noted above. The one major external contribution was the workflow I used for moving model files from DigitalOcean <<https://www.digitalocean.com/>>, where I ran Mallet due to the size of the corpus, to AmazonS3 <<https://aws.amazon.com/s3/>> for storage and locally for use, which was set up by Jason Wieringa.

Read the Process Statement online at <http://dissertation.jeriwieringa.com/about/>.

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<http://dissertation.jeriwieringa.com/bibliography/biblio-main/>.

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BIOGRAPHY

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