Discover How the Gale-ASECS Fellowships Expanded Research Possibilities

Read How One Fellow Used Digital Humanities Tools to Analyze Number Terms Used During the Eighteenth Century

Sarah Weston
Doctoral Candidate, English,
Yale University, U.S.
Gale-ASECS Non-Residential Fellowship

MEET THE SCHOLAR

As one of five researchers awarded a fellowship from Gale and the American Society for Eighteenth-Century Studies (ASECS) in 2022, Sarah Weston used digital humanities tools to examine eighteenth-century poetry and art through the lens of mathematics. Weston’s project, “The Shape of Numbers, 1701–1800,” analyzes number terms to offer a new way to speak about the movement from the Enlightenment to Romanticism and the change of sensibilities that took place at the end of the eighteenth century.

All Gale-ASECS Non-Residential Fellowship recipients were granted access to Gale’s Eighteenth Century Collections Online (ECCO) and Gale Digital Scholar Lab (the Lab) for a six-month period of research. ECCO is the most comprehensive online historical archive supporting eighteenth-century studies, connecting researchers to every significant English-language and foreign-language title printed in the United Kingdom between the years 1701 and 1800. The expanse of content housed in ECCO meets substantial research potential in the Lab, an industry-leading, text- and data-mining research environment that removes barriers to digital scholarship.

Fellows received training to use the text- and data-mining tools available in the Lab to explore ECCO and advance their work using digital humanities methods. Read on to see how Weston used this powerful cloud-based analysis platform to run meaningful analyses using digital humanities tools and make new discoveries.
ENHANCING RESEARCH WITH DIGITAL HUMANITIES TOOLS

Weston’s concentration during the Gale-ASECS fellowship supports her larger ongoing research examining the concept of number during the eighteenth century. “My current book project studies shifting attitudes to number from 1660 to 1840, perceiving a rift between early and late eighteenth-century thought about quantity across many different fields, from poetry and art to science and mathematics,” noted Weston.

“‘The Shape of Numbers’ is a digital humanities offshoot of this project, using Natural Language Processing (NLP) tools available in the Lab and the open-access tool Voyant to track how approaches to number and quantity shifted across the century. The Lab particularly allowed me to identify and study a larger sample set than I was previously using and also helped me identify sources I had not been aware of that have now found their way into the final book project.”

Weston outlines that implementing digital humanities tools into her project was a natural phase for a number-based analysis of eighteenth-century content. “It seemed like a necessary step to turn to digital humanities (which evaluates and considers literature numerically) and examine how quantitative methods could help me approach my research question,” the scholar said.

HARNESSING THE POWER OF TEXT & DATA MINING

The Gale-ASECS fellowship provided Weston with the digital humanities tools and training she needed to take this next step in her research.

When thinking back on her experience before she had access to the Lab, Weston said, “My arguments had revolved around close readings of keywords, yet because I am studying a large-scale redefinition of what quantity meant over the century, I had been also trying to get a sense for all the ways quantity terms were being used in the period. The Lab really helped me expand my sense of all the types of genres of texts I could include within this project, from not just collections of poetry and philosophical works but treatises on art and mathematical textbooks, to books on garden design, children’s books, and almanacs . . . I was able to find gaps in my current research and catch relevant uses of number terms in places I would not have thought to look in or in familiar areas that I had forgotten about.”

Weston elaborated, “Beyond merely helping me create a better, larger data set, the Lab helped me organize, sift through, and make sense of the material I was working with . . . The ability to have the raw OCR [optical character recognition] text directly side by side with the facsimile image was so helpful to me as I was sifting through all these new texts. I could copy-paste the OCR text and cut down on my time typing as I was taking notes on useful items to circle back to. So the various elements and infrastructures of the Lab and its seamless integration with ECCO and the other databases I was looking at really helped me format and prepare texts for analysis.”

“It was really staggering how quickly everything could be done,” Weston added, outlining how the Lab helped streamline her research, including features like “pulling up the OCR text alongside the image from the database, being able to download files very easily, sort through the search based on OCR reliability, organize files into content sets very quickly, clean the OCR text, and analyze using so many different tools.”

“I was surprised and impressed by the wide variety of tools I could use to [almost instantaneously] analyze OCR text acquired through ECCO. The user interface (UI) was very approachable and navigable, and it was wonderful to see how seamlessly integrated ECCO was with the Lab’s interface.”

“The Lab was an invaluable tool for me as I worked on this project, and my work on this digital humanities project will help shape my work as it transitions from dissertation to book form.”
Impact Report: Discover How the Gale-ASECS Fellowships Expanded Research Possibilities

OVERCOMING CHALLENGES BY CUSTOMIZING CONTENT SETS

The Lab guides users through an intuitive research process in three steps: Build, Clean, and Analyze.

In outlining her approach to building content sets, Weston said, “I had been working with just close-reading texts, discussing number words (‘few,’ ‘many,’ ‘multitude,’ ‘infinite,’ ‘nobody,’ ‘one,’ etc.) in very precise terms. But in transitioning to using the larger scale digital tools available in the Lab, I became truly aware of how vague some of these number words really are when tracked across such a wide collection of texts. Words like ‘myriads,’ ‘hundred,’ and ‘thousands’ might be easy to track, but something like ‘half,’ ‘infinite,’ ‘few,’ ‘nobody,’ and ‘one’ were almost impossible to track.”

To help overcome this challenge, Weston said, “I ended up having to experiment with approaches and adapt the project to exclude certain terms and focus on more-delineated terms to try to get more-accurate results.”

After refining her search criteria, Weston made new discoveries building her content sets. “I thought it was particularly fascinating to look at the content sets and see how the Lab will note a list of authors in the content set, along with a numerical value of how many of their works are in the set. Thus, I could essentially see how interested an author is in a given number word by just looking at how frequently their works found their way into the specific content set,” Weston said.

“I am so grateful for the opportunities this fellowship has afforded me—training me in so many different tools and so many new skill sets, and providing me with so many new experiences problem-solving and troubleshooting issues.”

PREPARING DATA FOR ANALYSIS

After users build their data sets in the Lab, they can customize their own cleaning parameters to prepare the data for analysis.

“The ‘cleaning’ tool was an incredible resource for me,” Weston said. “Being able to remove punctuation, numbers, etc., instantaneously was an absolute game-changer. In one of my previous digital humanities projects, I was unaware of the ability to run cleaning configurations on OCR text and spent a lot of time meticulously sorting through it all and cleaning it up by myself, so I know how much time it takes to manually do all of this. The cleaning tool on the Lab saved me countless hours on this project, and I was really taken aback by all of it.”
FINDING NEW INSIGHTS WITH ANALYSIS TOOLS

When sharing how the Gale-ASECS fellowship benefited her research, Weston noted, “The most valuable aspect of this fellowship was the sheer wide variety of analysis tools I was able to work with. I began the fellowship not entirely knowing which method of analysis or approach would be the most helpful for me . . . I was really grateful to have all of these tools at my disposal as I was narrowing down what the most valuable approach would be.”

Weston elaborated, “Named Entity Recognition ended up being one of the most helpful tools for me. I was not expecting this, as I previously assumed that Named Entity Recognition primarily was used for finding names of people and places. However, I was really pleased to see that I could also sort for ‘Measurement’ and ‘Number,’ which ended up yielding the most-fruitful results for my project.”

DISCOVERING QUANTITATIVE DATA TO SUPPORT THEORIES

Working in the Lab gave Weston the tools she needed to confirm hypotheses she was unable to prove before the fellowship. “The biggest confirmation I had occurred when I was searching for ‘heaps’ and ‘piles’ and ‘masses’ and kept getting a very large number of hits on texts written on slavery and abolition,” said Weston. “I had been previously studying the imagery of heaps as they were depicted by the abolition movement or in texts about slavery, but my sample size had been quite small (Equiano, Clarkson, etc.) and I had not been aware that it was even more pervasive than I had known. I would not have stumbled upon this information without using the Lab.”

The Lab allowed Weston to find more quantitative data supporting her theory. “Now I can assert with confidence that many, many writers were using the same imagery and gravitating toward these specific words in abolitionist literature, at large,” she said.

Giving a specific example, Weston noted, “One particular hit in this search came from a report on The Improvement of the African Trade Farther Demonstrated by Separate Traders [1708]. . .

“After working with the different analysis tools available to me during this fellowship through the Lab, I feel newly invigorated to return to my in-process project, eager to use the new tools I have familiarized myself with in the interim.”
the search had led me to an instance of a text written about slavery from the earlier eighteenth century that was not riddled with imagery of heaps, piles, masses, multitudes, etc., that I had become accustomed to seeing in later eighteenth-century texts."

Following this realization, Weston approached her research in a new way. "I began purposefully expanding my search to target just texts written earlier in the eighteenth century . . . I was able to find many other instances of this: texts that spoke about slavery but avoided those terms about numbers that skewed negative. This helped me ratify my initial assessment/hypothesis—that the imagery of piles and heaps and tortured masses, the anxious feeling about multiplicity and numerosness when discussing the slave trade was a sentiment unique to the late eighteenth century, emerging during the period of abolition, as a new attitude arose toward quantity and numbers: a new reckoning with the sheer magnitude of people affected by the slave trade."

"I overall feel immensely ready to both teach these tools and also use them to tackle new projects and return to old ones with new insights and tools at my disposal."

The Improvement of the African Trade farther Demonstrated by Separate Traders, in Answer to a Scurrilous Paper, called, The Falsities of Private Traders Discovered, 1708, Ecco.
Get an Inside Look at Powerful Research Tools

Want to learn more about the resources Weston used to enhance her research and develop her digital humanities skill set?

Discover the possibilities of Gale Digital Scholar Lab at gale.com/digital-scholar-lab

Find more information about Eighteenth Century Collections Online (ECCO) at gale.com/ECCO

Interested in learning more about ASECS?

Find more details about the American Society for Eighteenth-Century Studies (ASECS), including the society’s initiatives and events, at asecs.org