ABSTRACT:
CR/10 is a digital oral history platform that aims to collect and preserve cultural memories of China’s Cultural Revolution (1966–76). With a rhetorical analysis of the design features and curation processes of the CR/10 website, this article discusses the functions of CR/10 as a Warburgian memory atlas that shape the nonlinear, multifaceted narratives of a historical incident. Alongside this rhetorical analysis, I also conducted three sets of user experience studies with over thirty participants both within and outside the academy, including an ethnographic conference observation, a virtual ethnography of an online book group, and several semi-structured interviews, to examine CR/10’s usability and propose new design opportunities to empower the interface. This article offers a strong case for the datafication of cultural memories and contributes to digital archives and humanities interface design with an innovative theoretical lens.

KEYWORDS:
CR/10, digital archive curation, Chinese Cultural Revolution, Aby Warburg, interface design

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Curating China’s Cultural Revolution (1966–1976): CR/10 as a Warburgian Memory Atlas and Digital Humanities Interface

RONGQIAN MA

LASTING FROM 1966 TO 1976, CHINA’S CULTURAL Revolution, also named the Great Proletarian Cultural Revolution by Mao Zedong and the Chinese Communist Party (CCP), was a political movement aimed at preventing the return of capitalism and creating a path for the further development of socialism in China. This Great Revolution was called a “cultural” revolution because it started from criticism of the cultural arena and was aimed at “touching people to their very soul.” Following Mao’s death and the eradication of the Gang of Four in 1976, the CCP’s Central Committee officially declared the end of the Cultural Revolution at the party’s Eleventh National General Congress. In June 1981 the Sixth Plenum of the Eleventh Central Committee issued the “Resolution on Certain Questions in the History of Our Party Since the Founding of the People’s Republic of China,” stating that the Cultural Revolution has “caused the Party, the state, and the people to suffer the most serious setbacks and losses since the founding of the nation”; it was “an event initiated by a leader’s mistake and exploited by counter-revolutionary groups, bringing disaster and civil unrest to the party, the state, and the people.” Following this statement, elite politicians and intellectuals who had been suppressed during the Cultural Revolution regained discursive power and began reassessing the historical incident. Despite limited access to archival materials of the Cultural Revolution, over the last few decades, scholars, artists, and information professionals have made tremendous efforts to rethink and reconstruct the image(s) of this historical incident.

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Forty years after the end of the Cultural Revolution, to promote public remembrance and discussion of this significant period of Chinese history, the East Asian Library at the University of Pittsburgh launched CR/10 in 2016, a digital oral history project that aims to collect and preserve distinct individual experiences and memories of China’s Cultural Revolution through ten-minute, semi-structured interviews. Using a snowball sampling technique for interviewee selection, the CR/10 project has thus far collected more than three hundred interviews with people from different generations, geographies, occupations, and social backgrounds who have either experienced the incident themselves or only learned about it from family, school, digital media, or other circumstances. Each interviewee of the project was given about ten minutes to speak freely of their impressions, memories, and thoughts of the Cultural Revolution, although, in actual practice, some interviews went longer than ten minutes. All the interviews were video-recorded and made openly accessible with complete transcriptions through the interactive CR/10 website.

CR/10 functions as both a digital archival collection and a digital humanities interface that leverages user-centered interactive design to (1) facilitate a flexible, multifaceted representation of cultural memories in a digital space and (2) engage the general public in the remembrance of this historical incident in contemporary time. As demonstrated by the creator of the CR/10 project, histories of China’s Cultural Revolution are deemed “complex and complicated” because “a person’s memory varies according to his or her geographic location, age, profession, family background, and many other factors.” The CR/10 website, therefore, illustrates the complexity of cultural memories through a design approach that enables space for imagination and intervention among the users.

In this article, I first apply rhetorical analysis to illustrate how the CR/10 website functions as a “Warburgian” memory atlas that facilitates multifaceted accounts of China’s Cultural Revolution. This vision of a Warburgian atlas follows the theories and experiments of Aby Warburg (1866–1929) and his Mnemosyne Atlas project, which demonstrated the rhetorical power of images and their spatial arrangements in soliciting viewers’ appreciation and reevaluation of antiquity. Alongside the rhetorical analysis, I also conducted two sets of user experience studies to examine the usability of the CR/10 interface. Users were recruited from both within and outside of academia and include five scholars from an academic conference roundtable and twenty-five nonacademic users attending an online book discussion group. With both the rhetorical analysis and user experience research, this article addresses two central questions: (1) How do the current design features of CR/10 function in constructing multifaceted narratives of China’s Cultural Revolution? (2) How is CR/10 received among different groups of users?

In this article, I address the two research questions from the dual perspectives of researcher and curator for CR/10. First, I assisted in the curation of the CR/10 digital collection as a graduate student worker and actively participated in interviewing and data curation procedures. Therefore, some of the analyses here benefit from my personal experiences and observations during the CR/10 curation process. Second, as a researcher, I analyze how design features of digital humanities interfaces shape understandings and interpretations of cultural narratives and collective memories of historical events. By addressing these two proposed research questions, this article offers recommendations that can further shape CR/10 as a digital humanities interface sustaining memories of China’s Cultural Revolution. With rapid paradigm shifts in the area of digital archives, characterized by trends such as computational archival science and design thinking, this article contributes to this special issue by (1) offering a specific case of cultural memory datafication.
within a cultural heritage institution and (2) demonstrating how Aby Warburg’s intellectual experiment empowers this datafication process for cultural information.

LITERATURE REVIEW
Datafication of Cultural Revolution Memories

Memories of China’s Cultural Revolution have been represented in various forms of media, ranging from memoirs, oral history testimonies, movies, and TV shows to social media platforms. These media channels function as what Michael Lynch and Steve Woolgar identified as representational devices, which reveal cultural memories and narratives across different social groups that are otherwise untraceable. With the rise of digitization technologies, cultural heritage institutions across the globe have collected the massive memory works available on the Cultural Revolution and begun to preserve and “open up” the data in widely accessible digital formats, providing a new means for representing the Chinese Cultural Revolution. Some prominent categories of digitized memory data include thematic databases and digital archive collections on China’s Cultural Revolution. These digital humanities infrastructural development efforts echo the larger context of digital curation in digital humanities and cultural data.

To ensure long-term sustainability and accessibility of cultural data, the digital curation of digital humanities projects has become an “urgent” and important objective, as data themselves, especially cultural data, are not objective, context-independent givens. According to Julia Flanders and Trevor Muñoz, digital curation in the digital humanities covers three major components: data capture and preparation, interpretive layering, and capturing scholarly agency. In the case of data capture and preparation, complications often arise when humanities data curators “have their own research agenda related to description, discovery, retrieval, contextualization, and preservation.” For example, how does one clean data while maintaining the uniqueness and originality of cultural datasets that humanists value? And how does one properly preserve and sustain cultural data while making them accessible? These are the important questions to take into account in curation practices.

Datafication of cultural data also involves another important aspect: how to leverage material forms of datafication to facilitate interpretation—namely, the “interpretive layering” step. As demonstrated in the massive literature on media studies, information design, and human-computer interaction (HCI), material forms of digital artifacts, such as those of databases, websites, and interfaces, are important in shaping and delivering interpretations. An early approach to interface design focused on functional machines’ engineering details to achieve optimized effects and efficiency. Beginning in the 1960s, an emphasis on human-computer interaction led to design interfaces that were adjustable for individual user needs and created an empty space between machine and user. The interface was regarded as a form of intervention power that could influence user behaviors during user-machine interactions and thus mediate intellectual and cognitive activities.

Lev Manovich raised the notion of “cultural interface” as a particular form of new media that extends from “old metaphors and action grammars” in general HCI design principles to include elements already familiar in cultural products. In Manovich’s words, this is an attempt to “find a middle ground between the conventions of general-purpose HCI and the conventions of traditional cultural forms.” For example, HCI values the “consistency principle,” while, comparatively, “cultural interfaces try to accommodate both the demand
for consistency and the demand for originality . . . [and] try to create their own language rather than simply using general-purpose HCI.” Johanna Drucker calls for a humanistic approach to interface design and argues that interfaces oriented for digital humanities should be a dynamic zone in which reading takes place. Digital humanities interface design following this principle not only aims to increase usability and efficiency but also considers how interfaces engage users’ interpretations and critical abilities. Research has demonstrated that visual data displays incorporated in an interface, in particular, are a critical component in achieving humanistic interface design. Analyzing several historical digital humanities interfaces (e.g., the Valley of the Shadow project), Claire Warwick also illustrates the rhetorical power of interface design in shaping historical accounts, memories, and scholarship.

Finally, important to digital humanities is the scholarly agency that datafication fosters, underscoring how the curation of digital humanities artifacts is a scholarly activity saturated with subjective arguments and standpoints. According to Flanders and Muñoz, “capturing scholarly agency is vital to the hermeneutic aspect of humanities work, as the debates, editorial voice, and other metanarratives provide context for the original works.” Like other scholarly works, a curated digital humanities artifact represents the voices of curators. Recognizing this aspect is essential in understanding that datafication of digital humanities projects is not only a shift of representational forms but also a curation and transformation of narratives. In the specific case of CR/10, its nonlinear, multifaceted narratives are shaped by the interviewees whose memories and thoughts were recorded and preserved in the collection and by the curators who leveraged curation power and design methods to frame arguments via the interface. Besides serving as a case that illustrates the three aspects discussed above, CR/10 also contributes to the scholarship on the datafication of cultural data by building upon the theories in the Warburgian memory atlas and applying it as a specific model, which is reviewed in more depth in the following section.

**Aby Warburg and the “Mnemosyne Atlas”**

Aby Warburg was a German art historian and cultural theorist. As an art historian, Warburg focused on the legacy of the classical world and the Renaissance. But more broadly speaking, Warburg’s scholarship also attempted to address the relationships between visual objects, techniques, and strategies and those relationships’ impacts on shaping the delivery of knowledge. Warburg proposed the metaphor of the “image vehicle” (Bilderfahrzeuge), or images that have the power to transmit and mobilize ideas and cultural memories across time and space.

The *Mnemosyne Atlas* was one of his experimental attempts to illustrate how images and their spatial arrangements have rhetorical power to (re)shape memories and interpretations of antiquity. Warburg began the *Mnemosyne Atlas* project in December 1927, but he died in 1929 before it was completed. He pieced together forty wooden panels with approximately a thousand visual materials of all kinds, including pictures, maps, calendars, and diagrams collected from books, magazines, and newspapers. The panels comprised a pictorial atlas, the purpose of which was to demonstrate how ideas and memories of the past are sustained into the present. Themes in the *Mnemosyne Atlas* include “coordinates of memory,” “vehicles of tradition,” “the classical tradition today,” and “archaeological models.” No captions or text elaborating on their meanings, purposes,
or implications accompany the panels. Panels A–C serve as the preliminary guide to the project, where Warburg showcased certain pathways to navigate the other panels and laid out the project’s essential grammars (or syntax).29

The programmatic design of the Mnemosyne Atlas follows the central principle of distance. According to Warburg’s own introductions to the Mnemosyne Atlas, the “conscious creation of distance between the self and the external world may be called the fundamental act of civilization. Where this in-between space gives rise to artistic creativity, this awareness of distance can achieve a lasting social function—on whose success or failure as an instrument of mental orientation the fate of culture depends.”30 In Warburg’s own account, the creation and disruption of distance are the essential mechanisms of meaning production for the Mnemosyne Atlas, which can be further specified from three aspects. First is a sense of distance in physical space, or the distance between the photographic images and the narrative gap that distance produces. An image or pictorial reproduction is placed with another because they are related in some ways, but the specific relation(s) among them have never been articulated. As David Marshall illustrates, “Each image table can be understood as a series of potential exercises in which we move between stances.”31 From a viewer’s perspective, the meaning of a panel exists not only in image motifs but also, more importantly, in the spatial arrangements of these visual objects. Such a notion of distance was also echoed in later concepts such as the split-screen visualization display by Michael Lynch and the combination diagram by Scott Montgomery, influencing a broader field of visualization research.32

A second distinct feature of the Mnemosyne Atlas is the duality between the past and contemporary time—a critical, constant reflection on the current situation of both the creator and the viewer.33 Duality acknowledges the gap between the visual objects and the viewer through which the act of interpretation takes place. All the images and motifs used to create the Mnemosyne Atlas were taken out of their original contexts of production and are appreciated in the viewer’s current context. This situation includes both the larger temporal context in which a viewer positions themselves and their individual state, be it mental, social, or cultural.

Last but not least, the Mnemosyne Atlas creates a Warburgian sense of distance characterized by nonlinear discourses, particularly with instrumental assistance from pathways.34 Compared with the book tradition, which emphasizes the creation of fixed, logical narrative flows, the Mnemosyne Atlas strives to make arguments that are neither finalized nor singular. Attempting to do this in physical space, however, proved to be challenging. As Warburg recalled the difficulties in his diary, “The regrouping of the photo-plates is tedious: How to show the struggle for an antiquizing ideal style as (1) an argument between no[rth] and so[uth] and (2) as arguing gesture? . . . mass displacement within the photo plates. . . . Difficulty: the placement of Duccio. . . . Pushing around frames with Freund. . . . The arrangement of plates in the hall causes unforeseen inner difficulties. . . . Begun to cut out all the gods.”35

The rise of information technologies has transposed Warburg’s experiment into digital space and made it easier to deliver research outcomes in ways that Warburg could only imagine in the 1920s. Martin Warnke and Lisa Dieckmann created the project Meta-Image, which implemented Warburg’s methodological approach of Mnemosyne Atlas in the design of an interactive platform.36 From this research platform, scholars working with visual objects can replicate the same procedures and steps for which Warburg had advocated. Meta-Image strongly demonstrates the possibilities of remodeling the Mnemosyne Atlas
in digital space. For my study, Warburg’s intellectual experiment offers a conceptual model and specific approaches that also build on Drucker’s concept of humanistic interface, transforming a digital archival collection into an interactive, narrative-shaping memory atlas of China’s Cultural Revolution.

**CURATION OF CR/10 AS A WARBURGIAN MEMORY ATLAS**

The CR/10 website functions as a digital Warburgian memory atlas from multiple dimensions. Primarily, CR/10 is curated and organized based upon fragmented, independent oral history video units that together create the Warburgian mechanism of distance. Additionally, CR/10 aims to be a moving gallery in digital space that invites audiences to interact with the videos, to rethink the historical incident, and to create interpretations from their own perspectives. Furthermore, this project leverages specific design features (e.g., the ten-minute grammar and three pathways) to facilitate users constructing memory narratives or generating nonlinear and multifaceted narratives of the historical incident.

*Datafication of Fragmented Memories: Procedures*

CR/10 began with the conversion of historical human experiences into digital data. As illustrated in figure 1, the memories collected through oral history interviews were transformed into open-access data through five major steps. The first step was recruiting participants for oral history interviews. The curators of CR/10 utilized a snowball sampling technique to recruit participants, starting from personal networks and gradually expanding the interviewee pool based on referrals. No specific criteria were used to limit the interview pool; instead, anyone interested in talking about China’s Cultural Revolution was welcomed. This strategy led to the recruitment of participants in both mainland China and the United States who spoke either Chinese, English, or both. Each interviewee signed a consent form before they participated in the interview. In the consent form, the participant had the option to have their face covered or voice manipulated in the curated and open-access videos, if they wished.

The second step was video recording all the interviews. To preserve as much information as possible, this recording included not only the interviewees’ verbal accounts but also their body language, facial expressions, interactions with the interviewer, and the surrounding environment. No personal information, such as the names of the interviewees, was recorded in the interviews, however. The interviewees were also instructed not to mention any individuals’ names during the interview; if a name was mentioned during the recording, it was removed by curators in the next step, which focused on video processing. During this stage, curators used the anonymization principle and put the videos through a deidentification process that included removing all participants’ personal, identifiable information (e.g., names), obscuring some of the interviewees’ faces, or manipulating their voices to protect individual identities and privacy. The fourth step for datafication was transcribing interview content, creating textual data that could be used later to highlight essential messages from the original videos. The transcription data were the basis for the metadata creation, which was the final stage. Metadata for this collection followed the rules of Dublin Core and contained the materials’ essential information, such as the title, creator, identifier, date of creation, material type, specific descriptions, and rights.
information. The “description” field contained additional information about the recorded interview that could not be classified into other categories, for example, the period when interviewees were born, geographical areas where they lived during the Cultural Revolution, their family background, their occupation, and their highest level of education. Information of this kind, as I discuss further below, can be useful to empower the CR/10 website design, especially to increase its searchability as a digital humanities interface.

With the memory data in hand, curation of the CR/10 website to display those data went through three major phases. In the first phase, thirty-two processed interviews were demonstrated for open access; these created a prototype and initial blueprint for the website. Proceeding from this stage, in 2017 a team of China studies experts, librarians, archivists, and graduate students outlined the basic framework and crucial features of the website and populated it with materials such as an introductory video to the project and a teaser trailer of the interviews. The final stage was devoted to expanding the interviews, advocating for the project, and refining the website. The first version of the website contained the initial batch of sixty-seven interviews; currently, the number of videos on the website exceeds three hundred. Key design features of the CR/10 website that align with the Warburgian memory atlas include the timeline, the map, and what I would like to call the “ten-minute grammar”; I discuss these below.

**Design Features**

**The ten-minute grammar.** The ten-minute grammar refers to the principle of each interviewee only having ten minutes to speak of their experiences or memories of the Cultural Revolution. With these limits, each interviewee was prompted to focus on the experiences, events, or ramifications that they would most want to reveal. This ten-minute grammar was created based on three considerations. Its primary purpose was to record an interviewee’s most immediate responses, which often revealed an individual’s most unforgettable memories of the historical moment. The ten-minute grammar, then, functions as a filter for an interviewee’s memory bank, selecting the most unique “snippets.” Second, the ten-minute grammar was inspired by a user-centered design principle: ten minutes is the maximum length a viewer typically watches a single video, given people’s decreasing attention span amid increasing information distractions. The ten-minute grammar assists audiences in grasping the central messages of a video and maximizes the potential of CR/10 as an effective teaching and learning platform. The final consideration for the ten-minute grammar was mostly practical. Many individuals who experienced the Cultural Revolution (which affected over 80 percent of the participants for the CR/10 project) had numerous memories of the historical period that had to be organized before they

![FIGURE 1. CR/10 oral histories datafication steps.](image-url)
could be expressed. However, this process is time-consuming. The ten-minute grammar economized the time for each interviewee to collect as many distinct memories as possible to construct the multifaceted atlas of Cultural Revolution memories. It is important to note, however, that the ten-minute grammar was a design preference. When the interview exceeded ten minutes, the response was still included in the collection. The curation team did not dismiss any response based on its length.

**The three pathways.** As part of the design, CR/10 also includes three navigational pathways: the catalog, the timeline, and the map. The catalog is the first and foremost navigation pathway. The catalog of the CR/10 website, like the catalogs of all digital archival collections, performs the basic function of preserving and identifying collected oral historical accounts. Using the randomly assigned identifier for each video, a user can easily search and locate a specific video. In addition to the catalog, a timeline pathway was created to facilitate collection browsing and to model the temporality of memories from the Cultural Revolution.

Based on the time when interviewees were born, the timeline (see fig. 2) traces the chronological flow of memories across generations. Interviewees’ birth date information was used because it reflects the approximate age of interviewees when the Cultural Revolution took place, which could presumably influence their memories of the historical incident.

Along with the timeline, another pathway of CR/10 is the map of interviews (see fig. 3), which addresses whether CR/10 memories vary across geographical locations. All the interview videos were organized according to the major provinces the interviewees lived in during the Cultural Revolution. Younger interviewees who did not experience the Cultural Revolution directly were geolocated using the provinces in which they were born and raised. Under the provincial category, each interview is further classified into either a “countryside” group or a “city area” group, based on the interviewee’s living experiences. A user can click on a specific province and identify a complete list of interviews associated with that geographic area, grouped into the rural and urban categories. The darker red areas on the map showcase geographical regions that have not been represented in the video collection, such as Tibet, Xinjiang, Gansu, Fujian, and Taiwan. This may be attributed to the limitation of the snowball sampling method utilized during the interviewee recruiting process.

**FIGURE 2.** Timeline on the CR/10 interface. University of Pittsburgh Library System, http://culturalrevolution.pitt.edu/.
CR/10 as an Atlas of Paradoxical Histories, Forgetting, and Geographical Impacts

The ten-minute grammar and the three pathways enable users to navigate the collection in various ways and to explore the Cultural Revolution from diverse perspectives, shaping the CR/10 interface as a Warburgian, nonlinear memory atlas of the paradoxical histories and complex accounts of forgetting and remembering and of the geospatial impacts of China’s Cultural Revolution.

Serving as a basic functional unit for the memory atlas, the ten-minute grammar generates tension between “remembering” and “forgetting.” While browsing the video collection, users frequently hear interviewees say that they could only recall snippets rather than specific details of an event. Some remembered only traumatic death scenes they encountered; some can recite the *Quotations from Chairman Mao Zedong* word for word but cannot recall any specific events. Some only talked about the happy moments they experienced during this time, as if the Cultural Revolution didn’t negatively impact them at all. The ten-minute grammar forced the interviewees to focus on certain topics while simultaneously choosing to leave others out. Although none of the ten-minute interviews contain a comprehensive narrative of CR/10, altogether, they facilitate diversified understandings of this historical chapter.

The catalog shapes an atlas of paradoxical histories. The identifier assigned for each video in CR/10’s catalog pathway serves as a randomized index of the fragmented Cultural Revolution memories. The randomization of the videos, in this case, functions not only as a gesture for ethical, neutral treatment of interviewees and their life stories but also, more importantly, as a mechanism to display paradoxical histories of the Cultural Revolution and to trigger emotional responses from users. Interview narratives organized randomly may create contradictions—for example, a painful account of the brutality of Red Guards may be contrasted with a nostalgic recollection of the happy childhood during the same period. This design feature functions as a gentle warning for users interacting with the CR/10 interface to hold back from drawing generalizations solely based on the accounts they have encountered and to consider various versions of the story. From the perspective of Warburg’s *Mnemosyne Atlas*, randomization creates distance between each indexed object. This in-between distance inspires both emotional responses and critical reflections among users and sustains the idea of a multinarrative memory atlas for China’s Cultural Revolution.
The timeline formulates an atlas of forgetting. As Pierre Nora notes in his characterization of memories, “[Memory] remains in permanent evolution, open to the dialectic of remembering and forgetting, unconscious of its successive deformations, vulnerable to manipulation and appropriation, susceptible to being long dormant and periodically revived.” Navigating through the timeline, one can easily observe the gradual yet inevitable process of oblivion, forgetting, and ignorance of the historical period. The first interview displayed on the timeline features a woman born in the 1910s who, at the time of the revolution, was a translation scholar and recalls having all her possessions confiscated by the Red Guards and surviving in her basement for ten years. The majority of the video accounts gather around the 1950s and 1960s and display the widest range of narratives about the historical incident. Moving into the 1970s, 1980s, and 1990s, where the timeline concludes, only a limited number of videos (twenty-one) have been collected; these highlight a younger generation’s impressions of the Cultural Revolution. An atlas of forgetting evolves, this time with young interviewees from both China and the United States discussing how they have learned so little about the historical incident from history textbooks, popular literary or cinematic works, or their families due to various social and cultural reasons. One interviewee clearly states that she has no interest in the Cultural Revolution because it is so far away from her life.

The map creates an atlas of uneven geographical impacts. As a complementary method to the catalog and the timeline, the map offers another way to organize the videos and observe the spatial distributions of Cultural Revolution memories. While it might still be too early to make a solid conclusion, given the number of collected interviews, the map does suggest that historical impacts of the Cultural Revolution are not geographically equal, with Beijing being the most heavily influenced region and the southern, remote, rural regions receiving the least impact. Life experiences, as the data map demonstrates, also differ in central regions (e.g., Beijing) versus southern areas (e.g., Guangzhou Province).

CR/10 RECEPTION: USER EXPERIENCE STUDIES

To further demonstrate how the design of the CR/10 website as a memory atlas is received among users, I conducted a series of user experience studies with individuals both within and outside of the academy who had varying degrees of knowledge about China’s Cultural Revolution. The focus of the user studies was to examine the usability of the CR/10 website, especially the effects of the Warburgian design on shaping multifaceted narratives of the Cultural Revolution among communities of users. The user research raises new design possibilities for CR/10 and similar projects.

Data Sample

I identified two major user groups. One is an academic cohort, including China studies scholars, graduate students, and academic librarians with specialized knowledge of the Chinese Cultural Revolution. The other is a general users group, which, in this case, includes K–12 teachers, school librarians, and other educational professionals with enthusiasm for topics about China. The academic cohort consisted of five China studies experts from literary studies, film and media studies, and Chinese history departments. The general user cohort included twenty-five participants. Despite their diverse demographics, most were educational professionals, including K–12 teachers and librarians. Six were
recruited for more in-depth, semi-structured interviews. Among these, five were high school teachers, and the subjects they taught included world history, political science, social studies, and English. One recruited interviewee was an elementary school librarian. In summary, a total number of thirty participants engaged in the user studies. Table 1 shows an overview of the participants, the three user studies, and the datasets collected for each.

**Procedures and Methods**

The user research was comprised of two short-term ethnographic studies—one in-person and one virtual—and a set of six semi-structured interviews. An overview of the procedural design is illustrated in figure 4. The site of the physical ethnographic study was a roundtable discussion of the academic values of CR/10 that took place in March 2018 in Washington, DC, as part of the annual meeting for the Association for Asian Studies (AAS). The two-hour roundtable consisted of five presentations on CR/10 from the scholars and a Q&A session afterward. While attending the roundtable, I created five data memos based on the presentations and some follow-up personal communications with the scholars, particularly recording their comments on the current design features of the CR/10 website and their expectations for further improvements. The memos later served as the data for the analyses. Findings from this short-term ethnographic study typically reflected how the CR/10 website functions as an effective academic research tool among scholars.

To complement the findings from the roundtable, I conducted another virtual ethnography with users outside of academia. I joined an online book group on Mao and the Chinese Cultural Revolution organized by the National Consortium for Teaching about Asia (NCTA) at the University of Pittsburgh on ProBoards, a free message board service platform that facilitates online discussions. The NCTA book group is a semipublic forum with twenty-five K–12 teachers, librarians, and other educational professionals around the world who are interested in China and the Cultural Revolution period. The book discussion was divided into two sections. The first section centered on a biography of Mao Zedong written by the historian Jonathan Spence and several open-ended discussion questions based on the content of the book; the second section focused on the CR/10 collection. 41 I conducted participatory observations of the online book group as both a researcher and a discussion facilitator from January to April 2018.42 During this time, I observed weekly online interactions among users while participating in the design of discussion prompts.

**TABLE 1.** Overview of participants, user studies, and data

| User type       | Sample       | Source of study               | Data                                                  |
|-----------------|--------------|-------------------------------|-------------------------------------------------------|
| Academic users  | 5 participants| Ethnographic study at AAS roundtable | 5 data memos based on scholars’ presentations and personal communication |
| General users   | 25 participants| Virtual ethnography with online book group | 5 data memos based on the book group’s online discussions, organized around discussion prompts |
|                 | 6 participants| Semi-structured interview    | 6 interview transcriptions                            |
about CR/10. The discussion group had a total of five discussion prompts, including four focused on Spence’s book and one on the CR/10 website. The questions related to Spence’s book assessed the participants’ prior knowledge of Chinese history, culture, and the Cultural Revolution, while the final prompt aimed to gather participants’ general reflections on CR/10 videos and a broad sense of how they would use the website. Particularly for the CR/10 prompt, the participants were asked to (1) reflect on ten interview videos of their choice and discuss how those videos complemented (or did not complement) Spence’s book and (2) write a short discussion essay of one hundred to two hundred words on how they would utilize the source to satisfy their work or personal information needs. Answers to these questions served as an important basis for the recruitment of six participants for more in-depth, semi-structured interviews. While I did not have a fixed set of criteria for the participant selection, given the open-ended nature of the questions and the diverse answers received, I prioritized participants who demonstrated (1) strong interest in the collection, (2) potential intentions to use CR/10 in their work, and (3) critical thoughts on how the materials could be utilized. The selection process also considered participants’ availability and aimed to capture a relatively diverse pool of participants in terms of their demographics, perspectives, and information needs.

The virtual ethnography concluded in April 2018, and I then recruited six individuals from the book group to conduct further semi-structured interviews that looked deeper into the navigation preferences among general users of CR/10. The interviews started in April and lasted until December 2018. All the interviews were conducted virtually through Skype and were audio-recorded for transcription and analytical purposes.

Compared with the CR/10 prompt used in the online book group discussion, the semi-structured interviews used a more comprehensive set of questions to better suit research on usability needs. Each interview lasted for about one hour and consisted of three sections. First, each participant was given fifteen minutes to try the three navigation tools (i.e., pathways) on the CR/10 website, utilizing three scenarios I developed. These scenarios included the following questions: (1) How would you find video 0068? (2) If you wanted to know what happened during the Cultural Revolution in Xinjiang Province, how would you find the answer? (3) If you wanted to know how younger generations (e.g., those born in the 1980s and 1990s) view the Cultural Revolution, how would you find the answer? While navigating the website and working out these scenarios, participants were instructed to think out loud and describe their thoughts and steps. I passively observed this process without providing any hints or comments. However, if any issue or question arose, I would follow up and ask for clarification (e.g., why did you decide to take this step?). After the navigation exercise, I asked the interviewees to further reflect on their experiences navigating through the collection, and I particularly focused on two aspects: (1) Which pathway(s) do users prefer in order to navigate the CR/10 collection? (2) How
would the users evaluate the pros and cons of each pathway? Finally, at the end of each interview, I asked participants to give a general score of the usability of the website. On a scale of 1–5 (1 being the lowest and 5 the highest), how easy was the website to navigate? I also invited participants to suggest potential improvements for the CR/10 interface design and to discuss how CR/10 could better serve their information needs with additional or more refined features.

The three methods were combined to better understand the user design of CR/10 from the perspective of both the academic and general user groups. Admittedly, the environmental conditions for the three studies were different, since they took place on different occasions (i.e., at a conference, in an online discussion group, and in individual interview sessions). Participants in the roundtable and virtual book group interacted within their respective sessions, while participation in the semi-structured interviews relied more on users’ individual thoughts. However, it is unlikely that these different environmental settings jeopardized the findings or the validity of the study design, since the goal of the user research was to gather as many thoughts and opinions as possible for future development of the CR/10 interface, regardless of whether or not they came from collective or individual perspectives.

User Research Findings

The three user studies demonstrated distinct information needs and navigation preferences among the academic cohort and general users. The academic cohort demonstrated more appreciation for the complexity and flexibility of the Cultural Revolution narratives facilitated by the multiple pathways on CR/10, especially the timeline and the map. Scholars evaluated the timeline and map pathways as the features having the most academic value because they offered a wide range of options to shape Cultural Revolution narratives and held the potential to model and test assumptions about the Cultural Revolution. The pathways function, essentially, as a humanistic interface, where the infrastructure itself engages in making arguments.

Scholars at the conference also demonstrated an interest in more complex navigational features to organize and retrieve videos from the CR/10 interface. For instance, one scholar indicated a desire for features that allowed researchers to “only focus on interviews with women, so as to explore gendered expressions of the Cultural Revolution memories” and to “particularly look for children’s accounts in the collection.” Another scholar was interested in “taboo accounts” of the Cultural Revolution and the ability to examine only videos in which the informants had their images covered or voices distorted. These research interests exemplify academic users’ major demands for the increased searchability and analytical power of CR/10.

In comparison, general users with a lower level of familiarity with the Cultural Revolution appeared to have a stronger preference for the conventional catalog method. Two teachers and the librarian I interviewed said they preferred to use the video titles to navigate the collection. The title of a video in CR/10 is usually a quotation from the original video that highlights its most important message. As one participant claimed in the interview, “I browsed the quotations to find interviews that I felt interested in. If I were to use interviews for teaching, I might use them based on the age of the interviewees or where they were from in China. But for my purposes, I just pulled them out by what quote interested me the most, and that’s how I found them.”
Another interviewee also identified the catalog as his most preferred navigation method, saying that the titles “give you an idea of what the main point of the video was.” This contrasting preference between scholars and nonacademics could be simply explained by the fact that general users are not as equipped with the background knowledge to interpret messages from the CR/10’s timeline or the data map of the Cultural Revolution. As one user indicated, “I thought the map was interesting. But because regions do not mean as much to me as they mean to other people—I mean those who know the regions very well, I would like to approach it [i.e., the collection] with other ways.”

Beyond navigation preferences, general users also indicated stronger curiosity for individual life experiences rather than a systematic interpretation of memory narratives. When asked what improvements they could think of for CR/10, one user immediately stated that “it would be interesting to give updates on those interviewees, like where are they now and what are they doing? Kind of like their current status. Some of the video interviewees did talk a little bit about that. But it might help people place them in terms of where they ended up, what all of that has brought them to, and where they are now.”

As can be seen from the discussions above, the user studies suggest different degrees of usability for the three pathways. The randomized catalog proved to be the most effective for general, nonacademic users to browse the collection and develop a basic understanding of the Cultural Revolution by watching fragmented yet compelling individual stories of the Cultural Revolution. The timeline and map, by contrast, hold stronger analytical power to facilitate systematic memory narratives, but they require users to have certain historical knowledge to effectively interact with those features. All three pathways, however, effectively invited users to deeply engage with the collection by attracting them either with paradoxical individual memory accounts or with the analytical potential of design features.

**Implications of the Results**

Findings from the user studies reflect the various ways the Warburgian design of CR/10 facilitates narratives and reception of China’s Cultural Revolution among audiences, which is also strongly echoed in the extensive literature on the materiality of new media and its impacts on digital narratives.44 Most research on the materiality of media and information systems argues that specific material components (e.g., data structures, algorithms) of a digital artifact are leveraged as metaphors to make syntaxes for understanding. Therefore, a “close examination of the materiality of different information systems is crucial to understanding the implications of design choices in said systems.”45 Multiple principles have been raised to illustrate how new digital media forms represent narratives. Manovich, a pioneering media studies scholar who examines the complex dynamics between material forms and narratives, proposes principles such as numerical representation, modularity, automation, variability, and transcoding.46 Building on Manovich’s work, additional research into information systems design has also proposed that factors such as spatiality, mobility, and flexibility be considered.47 In fact, CR/10 stands out from other projects because of its nature as a Warburgian memory atlas. It is composed of nonlinear and multifaceted narratives of the Cultural Revolution that are facilitated by these material features and principles, especially modularity, availability, and flexibility.

Modularity reflects the “fractal structure of new media” in which media elements (e.g., images, sounds, behaviors) are organized and represented as “collections of discrete
samples.” According to Manovich, such media elements can maintain their independence while being assembled into larger-scale objects to create narratives. CR/10, in some respects, consists of these media elements (i.e., modules), including each individual video and the different categories of information within it, such as the participant’s date of birth and geographic locations. These elements are independent representational information units, but at the same time, they can be organized around different frameworks (e.g., space, time).

Closely related to modularity are the variability and flexibility principles. Because media elements are presented as independent modules, they can be easily reorganized into higher-level objects. A database, an interface, or a panel of a Warburgian atlas can be seen as such higher-level representations and can generate claims associated with but also independent of the included modules. In the CR/10 website, the three pathways function as such higher-level representational objects and reflect the fluidity of narrative flows across time and space.

Related to the principles above, results from the three user studies inform new design opportunities for CR/10. The first and most important opportunity, as illustrated by the scholar cohort user results, is increasing searchability of the interface. On the current CR/10 website, the timeline and map features support only browsing rather than searching. The catalog offers the only search method, but its searchable categories are limited to those included in the metadata. Expanding CR/10’s search functions would encourage users to interact with the memory data more directly. Moreover, constantly updating the searchable metadata would help satisfy diverse user needs, such as searching for gendered expressions or for prohibited accounts of the Cultural Revolution. Additional features like these would increase the searchability of the CR/10 interface and the potential dimensions and “modules” that organize the materials as advocated by new media design principles. The scholar cohort also demonstrated interest in performing analytical tasks within the interface and exploring live results. Infrastructural works of this kind in Asian studies scholarship include only a few examples, such as the China Biographical Database Project (CBDB) and the Chinese Text Project, where analytical tools are embedded in the interface to empower real-time data analyses. Such a consideration not only corresponds to the “automation” principle, as discussed by Manovich and other media studies scholars, but also resonates with the increasing computational trends in the field of digital archives, which calls for better leverage of machine power to increase the usability of archival data in the current digital information age. The final design opportunity inspired by the general users’ enthusiasm to share thoughts on individual videos is the creation of an “open feedback” field that allows the public to comment on or showcase videos from the collection and share them publicly on the interface. In the future, this may create a sense of community among users and gradually shape CR/10 into a more participatory, community-oriented application of digital archives, a trend that is also well reflected in scholarship. Despite the need for additional user data that would allow for more generalized findings, these user studies demonstrate the great potential for implementing such design opportunities to CR/10 and other similar digital humanities prototypes.

Challenges and Limitations of the User Studies

The user studies, however, also bear certain limitations. First, the participants in the user groups only consisted of users in the United States, particularly professionals working in education and research enterprises. Although this choice was made based on the initial orientation of CR/10 as a research and educational platform, studies with users from more
diverse knowledge domains and with varying personal interests would be beneficial to further improve the usability and the design of CR/10. In addition to the user groups, the data sample size was also limited. Although the semi-structured interviews and ethnographic research identified important usability issues for CR/10 and informed future design possibilities, a potential survey with a larger user pool would be particularly useful to support design choices and identify the optimal plans for future implementation.

CONCLUSION

As infrastructural systems rapidly advance in digital humanities research, digitalized cultural records undoubtedly serve important roles in shaping humanities knowledge and research practices. However, new paradigms are just beginning to form, and identifying effective infrastructures for humanities research remains a question. This article takes up this broad question with a specific case of CR/10, an interactive digital oral history interface designed to engage the public with memory works on China’s Cultural Revolution. With an in-depth rhetorical analysis of CR/10’s design features and three user studies on both academic and general users, I demonstrated how CR/10 functions as a Warburgian memory atlas and how it facilitates the multifaceted memory narratives among different audiences. By identifying the distinct needs and navigation preferences among various user groups, I further proposed three potential design opportunities: (1) increasing searchability, (2) expanding computational and analytical functions, and (3) enabling open feedback from the general public. Such design efforts may have the potential to further shape CR/10 into a public-oriented, digital humanities interface, in addition to an ever-moving atlas of memories.

NOTES

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