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This paper describes an exploratory study that was conducted to determine how academic libraries use Google Analytics, and how they balance the implementation of Google Analytics with their patrons' privacy. UNC System Library websites were surveyed to determine whether or not they utilized Google Analytics. The privacy policies of the 13 websites that ran Google Analytics were examined to determine whether their privacy policies contained language disclosing the presence of Google Analytics on the library website. In addition, interviews were conducted with employees from five of the libraries to determine how those libraries employ Google Analytics on their websites and how they balance the employment of Google Analytics with the privacy of their patrons. Four out of the five libraries reported actively using Google Analytics, but only one of those five library websites contained a privacy policy with explicit language pertaining to the website's use of Google Analytics.

Headings:

Web analytics

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BALANCING POWER WITH RESPONSIBILITY: HOW ACADEMIC LIBRARIES BALANCE WEB ANALYTICS WITH PATRON PRIVACY

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Chapter 1: Introduction

The academic library website is an integral and pervasive component of countless libraries' service to their patrons. By harnessing the internet's ability to connect with people regardless of geographic limitations, library websites not only augment the connection libraries have with their local community (by providing a platform for libraries to post opening and closing hours, where they are located, etc.), they also initiate connections with non-local patrons whose first exposure to a library is through their website.

To foster these virtual relationships with patrons, library websites provide a plethora of services to patrons that a physical library simply could not provide. Instead of having to drive to a library and spend time browsing through circuitous shelves of books like the libraries of old, a patron of the library of today can log into their library's website from their home computer, type a query in seconds, and be met instantaneously with pages of books whose full texts are accessible within the click of a button. The website allows students to see the locations and hours of various libraries on campus and "serves as a portal to library-acquired content" (Vechhione et al. 2016) such as electronic records and third-party databases. The website also provides a platform for faculty to present their scholarship and to connect to prominent academic journals and conference proceedings for research purposes. Instead of having to track down a reference librarian

in a crowded library, many library websites allow patrons to chat online with reference librarians in real time from their home desktops as they navigate through a library's collection.

Library websites not only enable patrons, but they enable librarians as well. Physical collections have been supplemented by electronic ones due to the interface of the library website, conserving vital shelf space for physical mediums like books and manuscripts and enabling librarians to disseminate a greater array of materials to their patrons. Library websites also serve as promotional platforms. Whenever a library begins a new program or event, the library website provides a platform upon which a library can market their new event to anyone with an internet connection, not just anyone who happens to walk through their door. In this context, the library website serves a multitude of purposes: as disseminator of library material and as a mechanism of outreach (Yang & Perrin 2014).

While a library website has the potential to serve many purposes, it can only be considered successful if it's used. Heinrichs et al. (2007) utilized the Technology Acceptance Model (TAM) to determine that the usage of a library website depends on factors such as it's perceived usefulness (e.g., how easy it is to search through an online catalog), its functionality as a service (e.g., electronic presentation of full-text materials), and its functionality in completing certain tasks (e.g., connecting confused patrons to reference librarians through virtual chat).

In efforts to optimize their websites to better serve their patrons, academic libraries have begun to employ web analytics tools to observe how online patrons interact with certain website components both old and new (Jones 2004; Fang 2007; Betty 2009;

Loftus 2012; Farney 2013). In particular, Google Analytics has emerged as the web analytics tool of choice for most librarians, primarily due to the fact that its use is free to anyone with a Google account, and also due to the fact that Google Analytics is relatively easy to use for a librarian who may not come from a web analytics background (Loftus 2012; Farney 2013).

As described in Google Analytics' developer's section (Google Analytics n.d.), Google Analytics works by copying and pasting a block of JavaScript code into the HTML of pages on which a user wants to run analytics reports. When a page is loaded by a user, so is the block of JavaScript code, which then references a JavaScript file that executes Google Analytics' tracking operations. These tracking operations pull data from users' HTTP requests, which contain a series of data points such as what site the user is coming from, and the device that the user is using to access the website, among other things. These tracking operations on individual users are used to create Google Analytics reports that track metrics such as the number of clicks a website's homepage yields within a predefined timeframe, how users navigate through web pages, the bounce-rate of certain web pages (referring to users who visit a website but then quickly leave), the geographic regions from which a website is accessed, and a list of other services that are customizable by whoever uses them.

Google Analytics therefore offers a variety of useful insights on how an academic library's patrons (which again, are mostly students) interact with a library's website. Equipped with a set of pre-defined goals for their websites (such as to see whether users will interact with a new librarian chat service, to see what queries users type in to find their website, or to see whether a new workshop on a certain database helped to increase

the click-rate of that database, to name a few) librarians are able to customize Google Analytics reports to gauge whether or not certain modifications to their websites are meeting those pre-defined goals. As opposed to more qualitative measures such as patron interviews and focus groups, which are unlikely to provide the generalizable metrics needed, web analytics reports provide real-time quantitative data on how users are actually interacting with the library website. Since building a website is rarely an inexpensive operation, web analytics tools such as Google Analytics allow librarians to show their stakeholders how valuable users find the library website and how certain sections of the library website are more heavily used than other sections (Loftus 2012).

Despite the attractive litany of advantages that a library website has when they run any sort of web analytics service, the very act of using a third-party service to collect data on patron behavior has the potential to conflict with an ideal that has been promoted in institutional publications like the American Library Association (ALA) Code of Ethics: protecting user privacy. Since its creation in 1939, the ALA Code of Ethics has included a statement on user privacy (Magi 2010). In the latest version of the ALA Code of Ethics, one statement reads: "We protect each library user's right to privacy and confidentiality with respect to information sought or received and resources consulted, borrowed, acquired or transmitted" (ALA Code of Ethics 2008). Back in its inception in 1939, the privacy provision in the ALA Code of Ethics was much easier to follow while observing user behavior, as gauging user behavior was restricted to relatively non-obtrusive observations like counting how many patrons used a certain reading room during a certain time or comparing the circulation numbers of popular publications, both of which can be accomplished while preserving patron anonymity. However, with the

dawn of web analytics tools such as Google Analytics, the line between observing user behavior and being unobtrusive in terms of user privacy has blurred, thus prompting an elevated sensitivity towards users' privacy from librarians whenever they employ automated surveillance tools such as Google Analytics.

Naturally, because of the sensitive nature of the information collected in the tracking mechanisms Google Analytics runs to generate reports, along with the vast array of additional information that Google collects from people who use its other services, Google maintains and updates a privacy policy multiple times a year, and mandates that those who use Google's tools use them in accordance with their terms of service. According to section 7 of Google Analytics' terms of service, "You must post a Privacy Policy and that Privacy Policy must provide notice of your use of cookies that are used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data… by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps" (Google Analytics 2016). Viewed from a library's perspective, this means that if a library utilizes a tool like Google Analytics, they must include a privacy policy that describes how they are using Google Analytics on every web page that employs Google Analytics. Doing so serves a dual purpose: it not only complies with Google Analytics' Terms of Service, but it also provides a tangible, albeit minimal, expression of a library's mission to protect their users' privacy.

So how do academic librarians' implement these privacy policies? What is the process for implementing these privacy policies? How do they coordinate the implementation of these privacy policies with the implementation of Google Analytics?

Put more broadly, how are academic libraries protecting the privacy of their users while simultaneously collecting user behavior data with Google Analytics?

To help answer these questions, this study examines how five libraries in the University of North Carolina (UNC) system utilize Google Analytics, and how they balance the privacy of their users with the employment of Google Analytics.

Chapter 2: Literature Review

To provide a broader context regarding the research questions of this study, the following literature review will outline methods that have been used in the study of library patron behavior, and describe how the traditional commitment of the librarian profession towards protecting their patrons' privacy has evolved over time. First, both qualitative and quantitative methods for measuring patron behavior and the effectiveness of library services will be described, from gate counts to questionnaires, and eventually to Google Analytics. Second, there will be a discussion of the librarian ethic of patron privacy, and how this ethic intersects with library service assessment methods, particularly with the use of Google Analytics on library websites.

Measuring the Value of Library Services

The employment of Google Analytics is the latest in a long history of methodologies aimed at measuring how patrons interact with a library service. Brophy (2014) claimed the question, "How good is this library service?", had a lineage that could be traced back to the Library of Alexandria. But one does not have go back millennia to find examples of librarians taking an interest in studying patron behavior. Orr wrote

about the emerging literature on assessing library services as far back as 1973. In more recent history, Long (2014) outlined quantitative and qualitative methods of library assessment. Within those decades a rich field of both qualitative and quantitative measures has emerged to more accurately convey how patrons interact with library services.

However, when one examines the literature from this proliferation of methodologies concerning library services assessment, a constant thread of concern over how to balance patron observation with patron privacy emerges. In this literature review a walkthrough of the library assessment literature will be presented, outlining both the qualitative and quantitative measures that have been written about over the years.

Questionnaire/Survey

A common method for studying how patrons interact with library services is the survey or questionnaire. Studies involving surveys generally entail distributing a set of questions to a sample of a population in order to estimate the characteristics of that population. Responses to these questions by a significant population sample could lead to insights regarding a population's opinions, beliefs, and behaviors (Dillman 2007). Because of their utility, surveys have been used in a wide variety of contexts throughout history. As Fowler (2009) notes, it is difficult to find an area of public policy that has not utilized surveys, from the US Census that is conducted every ten years, to surveys distributed by the Bureau of Labor Statistics to gauge the country's unemployment rate, to the surveys distributed by the U.S. Department of Agriculture to estimate the rate that

different crops are being planted. With such pervasive use throughout public life, it should be no surprise that the survey/questionnaire has proved to be an attractive methodology for librarians wishing to gauge the characteristics of their patrons.

A cursory look at the library assessment literature will provide numerous examples of surveys being used to gauge the beliefs, behaviors, and actions of patrons or librarians. In 2007, Marshall employed a large-scale critical incident survey of physicians and residents across over 100 hospitals across the USA and Canada. The questions put forth by the authors were meant to gauge how health library services are used to impact patient care. Clark (2014) conducted a survey with the students of Kent University's School of Music's online Master of Music in Education program. The 82 respondents to Clark's survey responded to questions concerning the awareness of library resources, how patrons would prefer to be helped, among other things. Oyinloye, Dangwaran, and Kantiok (2016) distributed a structured questionnaire to undergraduate students of Bingham University. In the questionnaire students from the humanities, social science, and management science fields were asked how they sought out information, revealing the library's resources as an integral component of student's information seeking. Whether it be hospital library services being used by health care professionals, music library services being used by online graduate students, or academic library services being used by undergraduates, surveys are a frequently used methodology that libraries use to estimate how users are interacting with their services.

Focus Groups

Acocella (2012) defines the focus group technique as "a 'non standard' technique of information gathering, based on an apparently informal discussion among a group of people" (p1126). A focus group generally involves a moderator/observer who posits questions to a group of people who represent a sample of a population that is the object of a research question. Then, depending on the study, there is usually an observer that analyzes both the verbal and non-verbal responses participants elicit during the group's discussion of a certain question.

Within the field of library science, focus groups have been conducted with patrons in order to collect their opinions on various library services. Glitz (1997) identified the focus group technique as a useful tool for a librarian wanting to gauge the opinions of their patrons in order to make more intelligent library service decisions in the future. Just in the last couple of years, an entire plethora of library assessment articles have been published that have used the focus group as a methodology to learn more about their patrons. For example, Einasto (2014) utilized a focus group to measure the effectiveness of e-services in a large academic library in Estonia and Höglund (2014) utilized focus group interviews to assess patrons' opinions of potential library services at Åbo Akademi University Library in Finland. Focus groups have been used to help librarians gauge their patrons' need for a public health informatics course (Yu et al. 2015) and to gather opinions of a new search option "Primo" at the libraries of The University of Houston (Kelsey et al. 2016), among a myriad of other examples. Focus groups are not

just constrained to patron discussions. For example, Siddique and Mahmood (2016) conducted three focus groups consisting of LIS experts and educators in order to gauge the efficacy of implementing a standard library software for libraries of higher education institutions in Pakistan.

Library Sweeps

Another popular methodology used by librarians to understand patrons' use of library resources involves *seating sweeps* or *sweeping studies*. Hursh and Avenarius (2013) define the sweeps method as involving "unobtrusive scheduled visual sweeps of predetermined zones within a building complex for the purpose of recording the personal characteristics, behaviors, and activities of individuals in that complex at a specific point in time" (p86). As they later describe, the sweeps method was introduced as early as 1986 by Brown, Sijpkes, and Maclean (1986), as they studied how people interacted with large public spaces (an office complex and a shopping mall) in Quebec. Not too long after, Hopkins (Leckie & Hopkins 2002) published a study inspired by Brown et al.'s work. Hopkins and Leckie's article examined how people used the Toronto Reference Library and the Vancouver Public Library Central Branch (two of Canada's largest central libraries). For their study, "a triangulated methodology, including an extensive written patron survey; face-to-face interviews with a smaller sample of patrons; in-depth interviews with library staff; and nonobtrusive patron observational surveys called seating sweeps were used on-site to investigate library patron profile, patron behavior, and library staff experiences" (p334). The mixing of seating sweeps with other

methodologies is a common feature of observational studies, and is reminiscent of how Google Analytics and other methodologies are used in combination with other methodologies in the context of library assessment. Since the sweeps method often employs a preconceived checklist of activities to monitor, seating sweeps are not considered purely ethnographic on their own and are therefore often used as supplements to other methodologies (Hursh and Avenarius 2013).

Looking at other works within the field of library assessment reveals some interesting combinations of the sweeping method with other methodologies. Leckie later teamed up with Given (2003), using the same combination of methodologies (an extensive patron survey, face-to-face interviews with patrons and staff, and seating sweeps). Silver (2007) examined how users interacted with the public spaces at a New England academic library using a combination of the sweeping method, staff interviews, the Bryant University Fact Book (2004-2005), library supplied activity and facilities metrics, the Bello Center building program document, and the comments from a library-sponsored LibQUAL survey from Spring, 2005. Hursh and Avenarius (2012) utilized the ethnographic sweeps concept in conjunction with observations and patron surveys to study how patrons interact with music library services. As one can see, the library sweeps method is a common way that librarians gauge how patrons interact with library services.

Counting

Counting is one of the simplest of library assessment tools at a librarian's disposal because all it involves is counting the number of patrons that utilize a certain library

service. Sometimes the actual counting is performed by a human observer (whether that be a librarian or student library worker) or something called a *library gate* or *gate counter*, which is an electronic gate that counts off patrons as they enter and exit the library. Despite the objectivity of such a measure in regards to patron population, library gate counts do not reveal much as to what the patrons did after they entered the library and before they left (Dotson & Garris 2008).

Regardless of this fact, library gate counts are still a popular method of measuring patron populations within libraries. As Dotson and Garris (2008) observe, in 2002 the University of South Carolina's main library, Thomas Cooper Library (TCL) employed electronic patron gates to measure patron population and use within its facilities. By counting the number of patrons that use a certain study room during a normal day, for example, TCL librarians were able to discern the amount of group study tables that would be needed to accommodate those patrons on a normal day. Counting can also be performed to measure things other than general patron population. Shepherd, Vardy, and Wilson (2015) used library gate counts in conjunction with time-diaries to estimate the amount of time patrons spent on average in a Canadian public library. In Long's 2014 article, he describes the library at Illinois State University employing the counting method to assess missed check-ins at the library's circulation desk. By the end of this counting study, Long and his co-librarians realized that 3% of materials that were returned to the circulation desk failed to be removed from patron's accounts due to "staff inattention or scanner errors" (p209), causing over 3,000 items to be mistakenly retained on patrons' accounts. Used in this way, it can be seen that counting can be used to uncover many important characteristics about internal library services.

Transaction Log Analysis

As Fang (2007) notes, the library website has become one of the most important services that a library can provide to their patrons. In many ways, the virtual capabilities of the library website correspond to the physical capabilities of the library building. Instead of wandering through the physical stacks of a library, a patron can visit a library's website from their home computer to access and browse the library's online catalog. Instead of having to travel to a library in order to learn about upcoming library events and talk to reference librarians, one can just visit the library's website to learn about upcoming events and enter an online chat session with reference librarians. Since websites have grown into such an essential library service, designing and maintaining these websites involves both technical decisions and administrative decisions (Fang 2007).

In order to better inform these decisions, librarians have begun to use transaction log analysis (TLA) to assess library websites. TLA is generally used in the context of analyzing programmatically how users interact with a system, oftentimes a search engine. Borgman, Hirsh and Hiller (1996) define TLA as a way to find out "information for describing patterns of system usage, analyzing frequency, type, and context of actions and errors, and recording the amount of time spent in various stages of a task" (p569). In an academic library setting, TLA is generally used for studying how library patrons interact with library systems such as online library catalogs. Villen-Rueda, Senso, and Moya-Anegón (2007) used TLA to examine how students at a large university library interacted with that library's online public access catalog (OPAC), concluding that students who used the library's OPAC were more likely to browse and to perform

analytical queries (i.e.,using more specific queries) than to perform more generalized subject searches. In 2015, Ameen and Arshad used TLA to pinpoint what services users of Punjab University Library's website utilized the most, and to determine the percentage of users that access the website from off-campus as opposed to on-campus. But there are limitations to TLA. As Ameen and Arshad write, TLA depends upon the analysis of a web server log file, which contains, "large amounts of data that are time-consuming, tedious and difficult to interpret and analyze" (p69). In fact, the researcher that conducted the study had to expend an entire semester to complete their analysis of the server log data. Because using TLA by itself to study patron-website interactions entails time-consuming analysis, the field of Web Analytics was born to create more streamlined programmatic strategies to analyze website use.

Web Analytics for Library Assessment

According to Loftus (2012), "successful Web design begins with analysis of user needs and behavior" (p45). Loftus posits the assumption that, if a website does not meet a user's needs, then that website will not be used by users. Since the creation of a library website is a costly expense, to ensure that library websites are useful to library patrons, Loftus suggests the use of web analytics to justify a website's value to stakeholders, and provide web designers with empirical data upon which to make future Web design decisions. Prom (2011) writes about how interpretations of web analytics data can help repositories improve access, use, and user satisfaction. According to Prom, most web

analytics tools include two elements: the capability to collect data on a website's user base, and the ability to generate intelligent data analysis reports on that data.

Google Analytics

Google Analytics is the successor of an expensive web log analyzer named Urchin. After acquiring Urchin in 2005, Google released Google Analytics later that same year as a free web analytics tool. As a free web analytics tool, Google Analytics has emerged as an attractive and common web analytics solution for librarians (Farney & McHale 2013). To use Google Analytics, all a librarian needs is a Google account. Once they sign into that account, the librarian can then set up a property, which is where the librarian inputs the URLs of the web pages on which they want to run Google Analytics. From there, Google Analytics gives the user a JavaScript tracking code snippet that the librarian copies and pastes into the HTML of the web page that they want to track. So when a patron visits a certain web page on a library website, the JavaScript snippet activates and collects data on the patron. That data is then sent to a Google Analytics server that runs customizable reports that convey data such as Top Viewed Web Page, the bounce rate of certain webpages (how quickly a user leaves a web page), and even the types of devices that users utilized to access the web page (laptops, mobile devices, etc.) (Google Analytics n.d.). As Farney and McHale (2013) note, despite the free price tag that Google Analytics comes with, libraries still have to invest in customizing their Google Analytics reports to yield data that is relevant to them.

In the library science literature, there are numerous examples of libraries utilizing Google Analytics to assess features on their library websites. Fang (2007) writes about

the Rutgers-Newark Law Library using Google Analytics on their library website to monitor how users browsed through the website. Using Google Analytics' digital dashboard, Fang and other librarians were able to quickly see how many visitors had landed on the website, the number of pages those visitors viewed, whether they were new or returning visitors, and even whether they came to the website from a search engine or some other website. These insights were then used to convince librarians and administrators that certain design changes needed to be made on the website. Vecchione et al. (2016) used Google Analytics' event feature on the website for Albertsons Library, an academic library at Boise State University. For their use case, Vecchione and the rest of the Web design team at Albertsons Library used Google Analytics' *events* feature to study how many users were able to successfully navigate through the website and view library resources, versus how many users "dropped off", or left the website immediately without viewing library resources. Barba and his colleagues (2013) used Google Analytics to measure the effectiveness of a new "Need Help" tool on the Texas Tech University (TTU) library website. Before running Google Analytics on the website, TTU librarians conducted patron surveys in order to predict the percentage of patrons that would actually use the Need Help tool. Although the survey responses seemed to suggest that the Need Help tool would be widely used, Google Analytics helped show that users actually found the Need Help tool (which manifested itself as a popup window if the user was inactive for a certain amount of time) "annoying" (p390). Using Google Analytics, the librarians at TTU were able to show that this Need Help tool was not performing the way their pre-assessment surveys predicted.

Aside from these specific examples, there is also literature in which librarians make recommendations for libraries thinking about using Google Analytics. For example, Yang and Perkins of the TTU Digital Resources department provide a step by step tutorial on how to deploy Google Analytics on a library website. Loftus (2012) and Turner (2010) both have recommendations on how to use Google Analytics to assess the effectiveness of various library website features.

With such a rich corpus of tutorials and case studies of libraries using Google Analytics to assess their websites, coupled with its free price tag, it can be reasonably assumed that Google Analytics is the latest in a long history of tools used to assess library services, in this case the services provided by a library website. Thus, this tool is the focus of the planned study.

The Library Ethic of Patron Privacy

As Magi (2010) observed, "For many decades, librarians have believed that protecting user privacy is a professional responsibility." (p255). Each version of the ALA Code of Ethics, including the original published in 1939, has contained language which defines a patron's right to privacy in a library context. Looking at the current ALA Code of Ethics, which was last amended in January 2008, we see that same commitment to the ethic of protecting user privacy that was first published nearly seven decades earlier. According to the third statement of ALA's *Code of Ethics:* "We protect each library user's right to privacy and confidentiality with respect to information sought or received and resources consulted, borrowed, acquired or transmitted" (ALA 2008). Such a

commitment to user privacy is important, as Magi (2010) suggests, because it ensures patrons that they will have the freedom "to read, view materials, ask questions, and conduct research without having to worry about surveillance, judgement, or ostracism" (p255). This freedom to freely access and explore information is an essential reason why public libraries play such an important role in the mechanisms that are integral to a democratic society (Hafner & Sterling-Folker 1993).

The library profession's commitment to patron privacy has not come without its challenges. In the Washington Post, McAllister (1988) writes about the ire of University of Maryland librarian Herbert N. Foerstel when he discovered that an FBI agent had been asking one of his libraries for information regarding the reading habits of patrons with "Eastern or Russian-Sounding names" (p3). A decade earlier, as described in a Chicago Tribune article entitled "IRS Is Granted Data Access By Librarians" (1970), the ALA found itself in conflict with the alcohol, tobacco, and firearms division of the IRS when the government agency requested records from Atlanta and Milwaukee public libraries regarding "who was reading books on the construction of explosive devices" (Chicago Tribune 10). After the ALA's Executive Board "had told the library officials throughout the country to resist all attempts by agents seeking access to records," they were ultimately mollified into a compromise which allowed IRS investigators to "inspect specific library records in justifiable situations" (p10).

Themes from this 1970 clash between the IRS and ALA reemerged in 2001 with the passage of the PATRIOT act. According to section 215 of the PATRIOT act, the FBI can apply for a court order which would give them the power to force an institution to produce "any tangible thing" that the FBI has deemed relevant to a terrorism

investigation. This means that a library may be legally coerced into producing 'tangible things' such as "library transaction records of patrons or library staff, library circulation records, computer use logs, and computer search logs" if the FBI views these as necessary to conduct a terrorism investigation (Bowers 2006, p380).

But do the wide-ranging powers given to the government by section 215 of the PATRIOT Act conflict with the ALA's *Code of Ethics* in regards to patron privacy? In response to the passage and renewal of the PATRIOT Act, the ALA has issued statements denouncing the legislation on its official website. In a section entitled, "Why does it [the PATRIOT Act] matter to libraries?" the ALA reaffirms its belief in the integral role that patron privacy plays in ensuring that the library remains a place where people can exercise intellectual freedom. According to the ALA, "Protecting patron privacy and the confidentiality of library records are deep and longstanding principles of librarianship that guide the ALA's legislative and policy activities on privacy and surveillance issues" (ALA n.d.). Because of this commitment to patron privacy the ALA believes that "certain sections of the USA PATRIOT Act endanger constitutional rights and privacy rights of library users" (ALA n.d.). In July 2005, the ALA Council passed a resolution urging Congress to allow Section 215 of the USA PATRIOT Act to expire, but to no avail. The PATRIOT Act was most recently renewed in 2015, leaving library records subject to FBI surveillance upon court order under present law (Hattem 2015).

Regardless of the ALA's lack of success in allowing section 215 of the USA PATRIOT Act to expire, their vocal opposition against this legislation, along with their extensive history resisting government invasion into patron records has firmly cemented the library profession as an institution who regards patron privacy as an ethic worth

defending. While the vast majority of librarians will not have to endure FBI interrogations like Herbert N. Foerstel had to in the 1980s, patron privacy is also a concern in the context of a field that has virtually nothing to do with national security: the field of library assessment.

Privacy Concerns Involving Library Assessment Methods

Across the methodologies of surveys/questionnaires, focus groups, library sweeps, and counting, the concept of anonymity emerges as the primary way in which libraries aim to protect their patrons' privacy in the context of library assessment. In Acocella's (2012) study that utilized focus groups, the researchers made sure to inform the participants that their answers would be anonymized. This assured researchers that their participants felt like they could speak freely and give honest answers to the moderator without future reprisal. This sentiment toward anonymity is also present in the survey distributed by Leckie and Hopkins (2002), where they inform the survey participants beforehand that their answers will remain anonymous (Leckie and Hopkins 2002). Additionally when Leckie and Hopkins performed their user interviews, they also included in their script wording to inform interviewees that their answers would remain anonymous. In research, protecting the anonymity of users not only protects user privacy, but it also ensures more genuine answers since participants don't have to worry about their answers being attached to their personal identities.

Google Analytics Privacy Concerns

It is not as clear that transaction log analysis and web analytics guarantee the anonymity of the users being tracked. Specifically, Google Analytics comes with its own unique privacy concerns for the librarian contemplating its use. In Google's 2010 Code of Conduct, they make a proclamation on privacy that has become synonymous with the Google brand: "Don't be evil" (Google Code of Conduct 2010). "Don't be evil" is essentially a declaration by Google that it expects both its employees and those who use Google products to use Google in an ethical manner.

Such a sentiment is evident in Google's privacy policies. Because of the sensitive information embedded in the mechanisms Google Analytics runs to generate reports, along with the vast array of additional information that Google collects from people who use its other services, Google maintains and updates a privacy policy multiple times each year in order to safeguard users, and mandates that those who use Google's tools agree to their terms of service. According to section 7 of Google Analytics' terms of service, "You must post a Privacy Policy and that Privacy Policy must provide notice of your use of cookies that are used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data… by displaying a prominent link to the site 'How Google uses data when you use our partners' sites or apps'" (Google Analytics 2016). When taking into account the library science field's extensive history with protecting user privacy, as evident in publications such as the ALA Code of Ethics and in historical conflicts with the federal government, using Google Analytics in accordance with the

"Don't Be Evil" concept seems to be the latest episode in librarians balancing the need for library assessment and the need to maintain user privacy.

To this end, several articles have come out with recommendations on how to balance use of Google Analytics and user privacy. The most tangible action a librarian can take to this end seems to come in the form of crafting a website privacy policy that lets users know that certain data points about them are being collected by Google Analytics. For example, Peterson (2010) gives four recommendations for librarians contemplating using web analytics on their websites for the first time:

1. Have a rock-solid privacy policy clearly linked to every page on your site.
2. Don't use tracking software you don't understand.
3. Know what tracking software you are using.
4. Have a clear answer for "how and why do you track"?
5. Be transparent if anyone asks what you're up to (p35).

Prom (2010) reports that, before even implementing Google Analytics, they developed a privacy policy in conjunction with the school's campus IT officer because "not only did state law require such a policy, but it was also good ethical and professional practice to inform users that we and Google were collecting and analyzing anonymous information concerning their visits (Prom 167).

Individual cases like Prom's are numerous, but it's not clear that academic libraries universally adopt this practice. Therefore, the planned study will examine the ways in which libraries in the UNC system of libraries are balancing user privacy with the implementation of Google Analytics. Specifically, it will address the following research questions:

1. Which libraries in the UNC system utilize Google Analytics for their library websites, and how do those libraries use Google Analytics?

2. Out of the libraries that do use Google Analytics, how did their privacy policies change, if at all, upon the implementation of Google Analytics?

Chapter 3: Methods

This chapter describes the methods used to explore how academic libraries use Google Analytics, and how they balance the implementation of Google Analytics with the privacy of their patrons. This exploratory study is set within the context of the libraries in the UNC system, and was administered in two phases. For phase one, the browser extension Ghostery (https://www.ghostery.com/) was used to track whether or not a UNC system library website was running Google Analytics. Of those that did employ Google Analytics, a sample of five libraries was selected for more in-depth investigation of their practices. In phase two, interviews were conducted with staff who worked in the sample libraries to gauge how those libraries utilize Google Analytics for their websites, and to gather information on what measures the library takes to ensure that the privacy of their users is not compromised through the use of Google Analytics. The setting and methods used in each phase are described in detail below.

Phase 1: Identifying Libraries that use Google Analytics

As described in the literature review chapter, the vast majority of studies regarding the use of Google Analytics on a library website range from specific use cases to general recommendations, but there is virtually no discussion regarding the use of

Google Analytics across a university system like the UNC system. Therefore, an exploratory study design was selected to see how Google Analytics was used across UNC system libraries, to document a use case that demonstrates how Google Analytics use varies across a particular state-wide system of academic libraries. To this end, prospective participant libraries were limited to the main library websites of each of the 17 schools that constitute the UNC system (see Appendix A). Since many schools in the UNC system also contain more than one library, and thus more than one library website, only the schools' primary library websites were considered for inclusion in the sample. Primary library websites were defined as the first website that is returned after a query of "[UNIVERSITY NAME] Library" into Google.

According to Ghostery's website (https://www.ghostery.com/our-solutions/ghostery-browser-extension), Ghostery is a browser extension that users can activate to see what their "digital footprint" is on any given website. Once Ghostery is installed on a browser, a blue 'ghost' button is added to the right of the browser's URL address field. When this blue ghost button is clicked upon, Ghostery generates a report that shows what tracking software is being run on the web page that the browser is currently displaying. A sample Ghostery report is included in Appendix E. To find out which libraries in the UNC System use Google Analytics, Ghostery was deployed on every library website homepage in the UNC System, much in the same way that Kaplan (2014) utilized Ghostery to examine which third-party e-resources in SILS ran 'dataveillance' (i.e., browser cookies) software.

Out of the 13 library websites that did run Google Analytics on their library homepage, a sample of five libraries was constructed. To ensure as diverse a sample as

possible, libraries were selected based on their Carnegie classification: three large-sized schools and two medium-sized schools were included in the sample. A university was considered 'medium-sized' if its student population was between 3,000 to 9,999 students. A university was considered 'large-sized' if their student population had at least 10,000 students (Carnegie Classifications 2016). An attempt was made to add small-sized schools to the sample, but the small-sized schools in the UNC system either did not run Google Analytics, or if they did run Google Analytics, they did not have anyone on their staff who was knowledgeable enough or willing to participate in an interview. For the final part of this phase of the study, the privacy policies of all the UNC system libraries that utilized Google Analytics were reviewed, to see if they include the provisions stipulated in Section 7 of Google Analytics' Terms of Service (see Appendix F).

Phase 2: Interviews

For phase two of the study, at least one library employee from each sample library was interviewed to see how their library employed Google Analytics, and how the library balanced the implementation of Google Analytics with the privacy of their patrons. To identify possible participants for the interviews, the faculty pages of each sample library's website were visited to look up the contact information of the library employee(s) who seemed most likely to be involved with the deployment of Google Analytics on the library website. For example, a relevant staff member in one library might have the title Systems Librarian, while in another library they might have the title Web Librarian. Once prospective study participants were identified, they were then

contacted by phone to see if they would consent to participating in the study (see Appendix C for recruitment script). Additionally, after being informed that neither their names nor the names of their institutions would appear in the final publication of this study, participants were also asked if they would consent to the interview being recorded. Once verbal consent for these stipulations was established, a time and place was then set up with the participant to schedule an interview.

The goal of the interviews was to get the participants to reveal how UNC system libraries use Google Analytics, and how they balance the use of Google Analytics with patron privacy. Based on this goal, an initial interview guide was prepared. A pilot interview was conducted with a librarian not included in the study sample, to test the interview guide's effectiveness. Once the interview guide was finalized (see Appendix B), interviews were conducted and recorded with six library employees across the sample of five UNC system libraries.

After all the interviews were conducted, interview recordings were used to create partial transcriptions. Only dialogue that pertained to a library's use of Google Analytics and how the use of Google Analytics affected their library's privacy policy was transcribed. Additionally, since the discussion of a library's privacy policy could potentially contain sensitive elements, in order to protect the identities of the interviewees and the institutions they worked for, pseudonyms were established for the relevant parties. In the transcription, and throughout this paper, interviewees were identified by letter (e.g., Participant A, Participant B, etc.). If more than one person was interviewed at an institution, a number was added to the pseudonym to distinguish between two participants that worked at the same library (e.g., Participant A1, Participant A2, etc.).

Furthermore, university libraries in the transcription were identified by the same letter as their corresponding participants for simplicity's sake. For example, 'Participant A' works at 'University Library A', 'Participant B' works at 'University Library B', etc.

After all transcriptions were complete, an inductive coding scheme was used to identify a list of key themes. If a certain passage pertained to a theme that was relevant to the research questions of this study, the theme and the passage were added to the code, or if another passage had already introduced that theme, that passage would just be added to the section of the code that already addresses that theme. Each interview transcript was assigned a color in order to delineate one interview transcription from another within the code. Once all relevant transcription passages were added to the code and delineated amongst the discovered themes, analysis was performed to see how the interviews answered the study's research questions.

Chapter 4: Results and Discussion

This chapter will report and discuss the major findings of this study. First, the use of Google Analytics among the libraries studied will be discussed, including which library employees are responsible for running Google Analytics, the reasons libraries use Google Analytics, the differences between Google Analytics workflows amongst the different libraries, and finally the benefits and challenges participants experienced while using Google Analytics. Next, findings regarding the participant libraries' privacy policies will be discussed, including which library employees are responsible for writing the privacy policy, and whether or not the privacy policies that were studied contain language pertaining to Google Analytics.

Who Uses Google Analytics in UNC System Libraries

For Phase 1 of the study, six participants were recruited across five libraries in the UNC system. University Library A, University Library B, and University Library C were located at universities that were considered 'large-sized' (at least 10,000 students). University libraries M and N were located at universities that were considered 'medium-size' (between 3,000 and 9,999 students). Despite the fact that all participants were the ones responsible for running their library's Google Analytics installation, only two participants shared the same job title. Participants included members of a libraries' 'Web

Team', a 'Web Liaison', a 'Head of User Experience', a 'Web Librarian', and a 'Public Services Librarian'.

Why Do UNC System Libraries Use Google Analytics

Each participant reported using Google Analytics to track library website traffic, and to learn more about their users. As Participant M noted, before their library used Google Analytics "we didn't really have any user data and we were about to embark on some major overhauls of both the university and the library sites. And we were trying to do more reporting in general." Once a library adopts and then activates Google Analytics, the Google Analytics reports that are generated are then used to help justify and inspire subsequent web design changes. According to Participant B, "We want to see page views, and what pages get the most hits…we track on our homepage how many people click on the catalog, the discovery service, Google Scholar. We now use it to track the click rate of databases but we mostly use it to track page views." Participant C1 shared a similar sentiment. When asked what their library used Google Analytics for, Participant C1 responded, "Traffic. There's a certain section of the website where we use customer led tracking just to track links…every single link on the home page is tracked. The databases section, the art box."

As one can see from these two responses, Google Analytics use on these library websites ranged from the general to the specific. Page tracking was a more general measurement that participants reported using Google Analytics to perform. Google Analytics' page tracking allowed participants to measure the aggregated number of times a certain web page was loaded onto users' browsers. Once participants created a Google

Analytics account, they added a JavaScript tracking snippet, ‘analytics.js’ to their website that was generally used to see how many views each page on a website yielded (see Appendix D for tracking code).

Due to the limitations of this high-level approach, tracking snippets were more frequently used to measure more specific metrics. For one, participants noted using Google Analytics not just to measure how many users visited a page, but to also see where users visited a page from. As Participant A attested, “we wanted to see a more complete story of what someone did on our site: here’s where someone started, here’s where they went, here’s what they did. Rather than just being able to say this many people went to that page.” This paradigm was utilized by the study participants to see which pages on the library website were the most findable across popular search engines (i.e., Google, Yahoo), and also to see which pages on the website were most findable from within the website itself. In this sense, UNC system employees reported using Google Analytics to perform path analysis, which is a term used to describe the different paths that users take on a website to get to certain pages on that website. Participants noted that Google Analytics’ user flow report, a visualization of the paths that users took to navigate a website, was especially useful for website redesign efforts. Participants C1 and C2 worked at a library that went through such a redesign and reported, “The cool thing is, when we were working on something like our navigation project or when we were looking at the big website redesign, you look at what the user traffic is and you look at paths when you start thinking about interaction design.” Participant B also talked about using Google Analytics to track user paths, while taking yet another metric into account, bounce-rate: “Sometimes librarians just kind of want to know page views, but sometimes

they want to know how are they getting there? You can kind of see what search engine or what web page people came from to get to where they're going...you can do path analysis, you can look at bounce rate to see if there are any pages where they bounce right back, which means it probably wasn't something they were looking for."

Getting even more granular, participants also reported using Google Analytics to track how many users clicked on certain links, especially database links. Using Google Analytics to measure and compare the click-rates of different databases that the library subscribes to and provides access to on their website is a Google Analytics use case that all participants reported. In order to achieve this, participants used a Google Analytics feature called Google Tag Manager. Essentially, once they obtained a Google Analytics account, participants created a Google Analytics *tag*. Google Analytics tags are used to track certain *events*. For example, in an e-commerce setting, a Google Analytics tag may be used to track the event of the purchase button being pressed for a particular sales item. From the interviews in this study, library employees reported using Google Tag Manager to create tags that tracked how many times a certain link to a database was clicked. Participants reported that if a database link were to yield a low click rate in a Google Analytics report, they would consider ending their subscription to that database in order to loosen their budget. As Participant N attests, "From Google Analytics, we can see if they don't click on some databases, and we have a tight budget, we may think about dropping those." Participant M similarly responded that, at their library, "we were looking for information about who was going where in terms of our spending for databases as well."

In addition to tracking database links, links to other resources were tracked as well. While also taking into account other metrics such as user paths and page views, Google Analytics' event tracking was used by UNC system library employees to measure the visibility and popularity of website content. Participant M described first using Google Analytics to see if users were still using website content that they considered to be outdated: "I implemented Google Analytics…at that point a lot of old content [was] on the site. And things like, guides for individual courses so we wanted to see if people were still clicking those." Participant C2 also mentioned using Google Analytics to confirm whether or not users interacted with older content: "So there are times when I will just…we'll be working on a project where we're reviewing certain content and you sort of stumble across links to things where you're like, 'What the hell! That's like five years old!' So that triggers us to check that content for other old content and makes us go to people and say, 'Hey, can we kill these 12 pages?'" Using Google Analytics to reevaluate old content was especially useful during University Library A's annual audit. According to Participant A, "once a year we do an annual content audit process. We go to everyone who owns a page on the library staff and say, 'Let's talk with you about, is the content up to date?, etc.' but we'll also provide them with a report of the traffic on that page for the year. And in an ideal world that then gives them some perspective of, ok, this page is going to take 36 hours to update, but 18 people used it last week, whereas this page would take me 2 hours to update and over 1000 people used it this week. So part of it is to help staff prioritize their efforts as far as what gets the most attention on the site." Likewise, Participant M reported that her library does "a bi-annual survey where I report on how many user groups on campus are using the site. Whenever you've got a dataset,

the interpretation and trying to put it together into a story that makes sense for folks who aren't really delving into it."

From there, other Google Analytics tasks varied from library to library. Some other use cases for Google Analytics on library websites included looking to see what devices visitors used to visit the website (PCs, laptops, mobile phones, tablets, etc.), running comparisons between on-campus traffic versus off-campus traffic, and to see what browsers visitors used to load the website. According to Participant C2, "we were doing a responsive redesign, so we looked a lot at what our mobile traffic was, desktop traffic. And over time we learned a lot about browser usage, which browsers we want to optimize for the website." When asked whether their library measured on-campus versus off-campus users, Participant A reported that "we know the IP ranges on campus. And so we have different views for on/off campus and all." Participants also reported that their library's use of Google Analytics changed over time. Participant B responded, "when we first started using it we didn't really set up too many customized events. We've done that more in the last couple years. We track on our homepage how many people click on the catalog, the discover service, Google Scholar." Other participants, like Participant A, reported that, at first their library wasn't really sure how to use Google Analytics, but then, over time, after a department shift, the use of Google Analytics started to become more strategic: "before the UX department existed we just had GA because we felt like we should. There wasn't a lot of strategic use on it. It was useful occasionally to tell people, 'This page has not been viewed more than 3 times in the last year. Do we really want to focus effort on it?' But it wasn't really used holistically…So once the UX department was formed, we tried to take a more proactive approach, looking at it more

strategically instead of just when people came to us." Participant M, one the other hand, reported that their library does not use Google Analytics as much as they did in the past: "Yeah we don't use it as intensively. It's one of those things that are on the back burner…But yeah it would be nice to revisit that.".

Differences in Google Analytics Workflows

Aside from Google Analytics tasks, libraries in the UNC system shared both similarities and differences when it came to their Google Analytics workflows. Participants M, N, C1, and C2 were the only people who possessed access to their libraries' Google Analytics accounts. Conversely, participants H and G were members of departments that divided Google Analytics work amongst small groups of employees. Although multiple people in Participant B's department utilized Google Analytics, all of those employees operated out of one department-wide Google Analytics account. Participant A's department had the most decentralized approach out of all the libraries that were studied. When asked whether multiple people in their department had their own Google Analytics account, Participant A responded, "When we started using GA yeah. Everyone has their own Google Analytics account(s) and to this day I've been cracking down on it some, but we still have something like 40 different accounts on the system and we manage permissions individually for each one."

Participants M and W were not only the sole managers of their libraries' Google Analytics accounts, but they were also solely responsible for their library websites' content. Meanwhile, at University Libraries H and S, librarians and other content experts

had more of a say regarding what content was put on the website. Participant C1 described their role as "the content strategist," stating that "new content areas don't get added to the website without my consent…The stakeholders are librarians, but there is less of a divide between librarians and support staff than there are in other library cultures." Participant A also expressed that their department, University Library A's User Experience Department, collaborated frequently with content experts in order to decide what content appears on the library website. According to Participant A, "we would generally work with whomever the content expert is on that page. So we know how to run the website, but I'm not an expert in American History in the same way our subject librarians are, so we'll take the data and work with them and interpret things."

The study participants also expressed differences when it came to which people in the library had input regarding which Google Analytics reports to run. Although all participants reported running generalized Google Analytics reports within their departments, there was some variability regarding whether or not participants fielded Google Analytics requests from stakeholders who worked outside of the participants' departments, such as requests from librarians, faculty, and content experts. On one end of the spectrum, such as at University Library N, Participant N and her supervisor were the only ones responsible for deciding what Google Analytics reports needed to be run. University Library C fell on the opposite end of the spectrum. Although Participants C1 and C2 reported running Google Analytics reports for themselves, they also reported that "often people come to us and ask, 'I'd like to see how this is performing. What can you tell us?' And then we sit down with them and give them a report or give them caveats. Lately we've been making dashboards for people." In this sense, part of University

Library C's Google Analytics work was reactive to external requests. University Library M fell somewhere along the middle of this spectrum, as rationales for Google Analytics reports were inspired by Participant M, but were also put before a Library Committee for approval.

Google Analytics Benefits and Challenges

Participants reported both benefits and challenges of Google Analytics use. The most frequently reported benefits from the participants revolved around being able to use Google Analytics to learn more about the users who visited their library websites. By being able to quantify how many people viewed certain web pages or clicked on certain resources, participants reported being able to obtain a clearer picture regarding which web pages and resources on their website were the most important (i.e., popular). According to Participant N, Google Analytics was beneficial for their library because, "we could see which pages were the most useful and which databases were the most useful." Participant N also found Google Analytics useful in measuring the effectiveness of certain library programs. "Sometimes after we give an information literacy class," Participant N reported, "we'll check the database numbers to see if they increased…They usually will increase." With more quantifiable knowledge regarding how users interact with their library websites, participants reported being able to make more intelligent web design choices. Participants C1 and C2 mentioned that, whenever a new web design project comes up, "data is actively used in decision making. We've seen that on projects like when we redesigned our gloval nav…use data is really what helped us trigger that

project." Participant M mentioned how Google Analytics reports were useful because they sometimes dispelled misconceptions regarding how visitors used their library website: "There were a lot of things that were surprising to us. A lot of pages that we would've thought were deeply buried and not frequently accessed that were getting a lot of use." Participant M also reported using Google Analytics reports to help justify putting a link to the library website on the university website's front page. Finally, another benefit that participants reported regarding the use of Google Analytics in libraries is that they found it fairly easy to adopt. As Participant B reported, "It's easy to use for librarians who might not know a lot about Google Analytics. For basic things like page views you just have to set up a timeframe from this time to that time, it has graphs, and it's free!"

Despite all the benefits, participants also ran into challenges during their experiences with Google Analytics. Participants C1 and C2 brought up one limitation that Google Analytics possessed that was also mentioned in other interviews: the fact that it can't measure everything. As they report, in 2014 when C1 and C2 optimized elements of their website for mobile phone users, Google Analytics reported that, after the redesign, the number of mobile visitors to the library website skyrocketed. But when Participant C1 showed those reports to their university's OIT department,

"They said, 'Actually, yes I'm not surprised by that. Because 2014 is when Android usage took off and we saw this sort of huge sea change in smart phone use on campus.' So you couldn't say, 'We made our site responsive and now millions more people are using it' or something. But administrators could have, if we just gave that data to them, they could've taken it and just said something like that: 'We made the site

responsive and doubled our mobile traffic.' Well, mobile traffic more than doubled that year everywhere, and it happened in a short period of time and they were astounded by it too, but there was really a clear sort of world shift that had nothing to do with us making our site responsive."

In this sense, Participant C1 claimed that the numbers gleaned from Google Analytics reports could be misinterpreted if they were relied upon too heavily and not used in conjunction with other metrics.

Another common challenge was concerned with the tracking of links that transported users to third-party databases. The libraries that were studied provide access to hundreds of databases. For Participant N, this was the biggest challenge. Since they were the only one's responsible for running Google Analytics reports for their library, Participant N reported that keeping track of the click rate for each one of their library's database links was very time-consuming. Even after checking all of the different database links, sometimes the click rate statistics that Google Analytics yielded could be misleading. Participant A summarized the problem: "In GA if you want to track every time someone clicks on a link that goes somewhere that's not on your site, so our e-resources or databases or whatever, by default that's not tracked…we had to put a line of JavaScript in every single link to file an event with GA when that link was clicked, which is impossible to maintain at the scale we've got. We have close to 1,000 databases." Also, since the databases they linked to were hosted on servers that did not belong to University Library A, Participant A also expressed how Google Analytics can't see what people actually use the databases for. Participant M also introduced the additional problem regarding how to track what a user actually does on a web page. According to

Participant B, “There used to be something called in-page analytics that sort of does that…but usually if people want heat maps they use other software. Normally you can incorporate these side by side with GA.”

But despite these limitations, the only reasons participants cited for not using Google Analytics were logistical as opposed to flaws inherent to Google Analytics. Participant M reported not currently using Google Analytics due to a position shift in their library that moved Google Analytics work to “the back burner”. Participants C1 and C2 reported that the reason why they didn’t use Google Analytics more regularly was because they lacked the staff to be able to fully optimize the service: “Our place is so full with everything else it’s one of those things that we know we should be more proactive about it but it just takes time to build a program around that. And we haven’t been able to build Google Analytics as a service as much as we wanted to.” Ultimately, everyone who participated in the study either actively used Google Analytics because they found it useful, or wanted to use Google Analytics more actively.

Google Analytics Use Discussion

The motivations reported by participants for using Google Analytics are consistent with motivations cited by past studies in the library science literature pertaining to the use of Google Analytics in academic libraries. Fang’s (2007) use of Google Analytics at Rutgers-Newark Law Library to quantify website traffic is a use case that all participants reported initiating. Similarly, participants also reported using Google Analytics to measure how website visitors traveled through the various pages on that

website, as described in Vecchione et al.'s (2016) study on the use of Google Analytics on Boise State University's Albertsons Library website. Just as Loftus (2012) writes about using Google Analytics data about a new *Need Help* tool that contradicted TTU Library's pre-assessment survey of the tool, participants like Participant M reported how Google Analytics reports could sometimes generate hard data that contradicted their preconceived notions regarding certain website content. Despite many of their methods appearing consistent with the methods referenced in the library science literature regarding Google Analytics, participants rarely mentioned the use of library science literature to inform how they used Google Analytics. Participants G, W, and M seemed to take a more ad hoc approach to their adoption of Google Analytics, as opposed to looking in any library science literature for past Google Analytics use cases. Participants C1 and C2 reported consulting "web sources and blogs," but only to get a general understanding of how libraries were adopting Google Analytics, as opposed to finding specific use cases. Participant A reported using resources from the library science literature to inform their library's use of Google Analytics, but he also expressed a definite need for more Google Analytics studies in library science literature.

Out of the UNC System's 17 main library websites, 13 employed Google Analytics. Based on the benefits that Google Analytics can pose to libraries, such as it's free price tag and it's ability to measure website user behavior, the fact that a majority of the libraries in the UNC system use Google Analytics is unsurprising. Despite this, the presence of Google Analytics tracking code shouldn't be conflated with the active use of Google Analytics. Since Ghostery is only capable of finding the presence of Google Analytics on a library website, all one can conclude is that someone attempted to use

Google Analytics, as opposed to concluding that they are actively applying the available data to questions and problems in their library. For example, despite the fact that the website for University Library M contained Google Analytics code, Participant M reported that they had employed Google Analytics in the past but, because of a shift in their job duties, they no longer actively use Google Analytics on a day to day basis. This seems to be the case in other libraries within the UNC System that did not participate in this study. For example, two of the libraries that were contacted to see if they would like to participate in the study responded that they could not because they didn't have anyone on the staff who was actively working with Google Analytics. For the nuances of the relationship between libraries and Google Analytics to be thoroughly known, more research is required regarding not just why libraries actively use Google Analytics, but why libraries start using Google Analytics before stopping indefinitely.

Google Analytics Presence (and Absence) in Library Website Privacy Policies

According to Section 7 of Google Analytics' Terms of Service, if a website chooses to run Google Analytics, they must disclose their use of Google Analytics within some kind of appropriate privacy policy. During the first phase of the study, once a sample of UNC system libraries that used Google Analytics was established, the privacy policies of those library websites were analyzed to see if they mentioned their use of Google Analytics, as stipulated by Google Analytics' Terms of Service agreement. Only one library contained an explicit disclosure of their website's use of Google Analytics, and that was University Library C. None of the remaining four UNC System library

websites that were studied contained any explicit privacy policy language that disclosed their library's use of Google Analytics.

Not only was the website for University Library C the only library website that contained language in their privacy policy that explicitly mentions their use of Google Analytics, but University Library C was only one of two libraries that were studied which had a privacy policy that was specific to the library website. University Library A had its own privacy policy for the library website that mentioned the library's use of web cookies, and which expressed the library's objective to collect as little Personally Identifiable Information as possible in accordance with North Carolina law, but nowhere was their library's use of Google Analytics explicitly disclosed. For the remaining three libraries, they all had privacy policies that applied university-wide, but not to the library website exclusively. This point of distinction is important because one could only access these policies from the university websites, and not from the university library websites. For example, the university that oversees University Library B has a university privacy policy that mentions the university's use of Google Analytics, but that privacy policy is only findable on the university website and not on the website for University Library B, which is located at a different domain (according to Participant B these two websites will be under the same domain in the future). The universities that oversee University Library N and University Library M have their own university-wide privacy policies, but both are accessible only through the university websites and not through the library websites.

When asked if their library's adoption of Google Analytics had any effect on their library's privacy policy or the privacy policy of the university, every participant expressed some form of doubt, including Participants C1 and C2, whose employer was

the only library studied who fully adhered to the privacy stipulations laid out in Section 7 of Google Analytics' Terms of Service. The reasons for this are two-fold. First, most of the participants reported that it was impossible for anyone to be personally identified through Google Analytics. As Participant B described,

"With GA there's really not too much to worry about in terms of privacy…I guess if you really care about privacy and didn't want to be tracked there is some javascript code you can download in your browser to hide that…but there's no way in GA to see the individual IP addresses of individual people…There's a way to filter IP addresses, but these are sort of obfuscated in GA…I can see what country they're coming from or what city they're coming from but that's generally not considered PII…since we don't collect IP addresses there isn't a big privacy issue there."

Participant A described a similar sentiment: "We look at it on the aggregate. It's rarely one person did something; it's more like 36 people did something."

Another reason participants seemed unaware of whether or not their privacy policies contained any language pertaining to Google Analytics is because they have no control over the privacy policy of their university. Participant N, Participant B, and Participant M work at universities that utilize a university-wide privacy policy, as opposed to a privacy policy that is specific to the library website. The University Libraries themselves didn't have any input regarding the language of their universities' privacy policies in these contexts. University Library A had a library-specific privacy policy, but Participant A reported having limited input to the language of that privacy policy, with most of the input coming from a Senior Leadership Team, a Library Leadership Team, and other senior administrators. Ultimately, despite being the primary

administrators of Google Analytics on their websites, none of the participants possessed the authority to add the use of Google Analytics to the language of their library's or university's privacy policy.

Privacy Policy Discussion

The fact that four out of the five libraries that were studied did not include an explicit declaration of their library's use of Google Analytics seemed to stem from two causes. As mentioned above, the first and most prominent cause was that the employees who were responsible for running Google Analytics for their library's website were not the same employees who were responsible for drafting the library's privacy policy. To reiterate, three of the five libraries lacked a library-specific privacy policy, and instead adhered to a university-wide privacy policy. This dynamic makes the requirement within Section 7 of Google Analytics' Terms of Service to include one's website's use of Google Analytics in the site's privacy policy impossible for these employees to unilaterally fulfill. Such a dynamic naturally led all of the participants, regardless of whether or not their library had its own privacy policy, to express doubt regarding whether or not their privacy policy included language that disclosed the library's use of Google Analytics.

The second cause for the majority of the libraries in the study not having language pertaining to Google Analytics in their (or their university's) privacy policy was the correct assumption that Google Analytics don't track individual users. As participants expressed, Google Analytics only allowed them to track users on an aggregate level.

They were able to track what percentage of users came from a certain range of IPs, whether they used a tablet versus a desktop machine, or how many used Google Chrome instead of Firefox, but they were not able to track the IP address, device, or browser of individual users. Because of this, it could be speculated that one reason they didn't feel like it was a priority to ensure that Google Analytics was in their website's privacy policy is because they didn't believe that use of Google Analytics infringed on their users' privacy in any way. This theory is further supported by the fact that when asked what advice they would give to other libraries who are thinking about adopting Google Analytics, not one participant mentioned re-evaluating their library's privacy policy in terms of its compliance with Google Analytics' Terms of Service, nor did they mention ensuring patron privacy as a priority in general. Regardless, this may be viewed as a more peripheral issue for further study, since this study focused on the mandatory inclusion of Google Analytics language in privacy policies, as opposed to whether or not Google Analytics actually infringes upon the privacy of the people it tracks.

Chapter 5. Conclusion

Understanding how patrons interact with library resources is a goal that librarians have held for decades. Library science literature contains a wealth of studies regarding the different tools that librarians utilize to better understand the behavior of the patrons they serve. As methods to study user behavior evolved, so too did libraries' protectionist attitudes towards patron privacy. The emergence of Google Analytics lies at an intersection of these two phenomena. In one sense, Google Analytics is yet another tool that librarians are employing to understand their users and thus better serve them. But in another sense, since Google Analytics utilizes code to track the attributes and movements of website visitors, the inherent technology of Google Analytics involves an ostensible compromise of something that libraries have been protecting for decades: the personal privacy of patrons. Although it is true that Google Analytics does not allow users of their service to track website visitors individually, the fact that their Terms of Service mandate the inclusion of explicit language in a website's privacy policy disclosing the nature and use of Google Analytics demonstrates, at the very least, a recognition on the part of Google that their analytics technology requires the capture and analysis of certain portions of people's online identity. In this sense, this section of Google Analytics' Terms of Service allows librarians to have the best of both worlds: a

technology that allows them to learn more about their users without having to worry about unduly infringing on their privacy.

This study attempted to see how academic libraries deal with this intersection between studying user behavior and conserving user privacy that lies at the heart of Google Analytics. As mentioned above, 13 out of the 17 library websites in the UNC System have used Google Analytics in the past or are actively using it. Due to time constraints, and the fact that some of the libraries who did run Google Analytics in the past are not actively using it, only five libraries in the UNC System participated in this study.

Readers of this study should come away with three major findings. First, this study provides detailed descriptions of how five libraries in the UNC system employ Google Analytics on their websites. Second, this study also found that four out of the five libraries that were studied do not include explicit language in their website's privacy policy disclosing the use of Google Analytics, as mandated by Section 7 of Google Analytics' Terms of Service. Third, this study showed that, out of these five libraries, the employee who was in charge of deploying Google Analytics did not know whether or not their website's privacy policy included a mention of the use of Google Analytics, and had little to no input regarding their library's privacy policy (if their library even had their own privacy policy).

These three findings inspire multiple areas for further study. Since only five libraries within the UNC System were featured in this study, a future study could expand the work of this study to every school in the UNC System to gauge why their libraries use Google Analytics, why they don't use Google Analytics, why they stopped using Google

Analytics, and how their employment of Google Analytics interacts with the language of their library's (or their university's) privacy policy. This model could also be applied to libraries across the country. Additionally, since the libraries in this study revealed an incongruence between the privacy mandates of Google Analytics' Terms of Service and the privacy policies of libraries, more work may need to be done regarding how reactive academic library privacy policies are to emergent technologies, and also how many academic libraries adopt their own privacy policies as opposed to simply inheriting the privacy policies of their university. Yet another study could focus on the use of Google Analytics in other contexts besides the context of academic libraries, and whether or not Google Analytics' Terms of Service are followed in general.

Ultimately, due to its small sample size, this study should be seen as an exploratory case study of how five librarians in the UNC System employed Google Analytics, and how they balanced that employment with their patrons' privacy. Further studies are required to see how well the experiences of these five libraries correspond with the experiences of other libraries in the UNC system, and other academic libraries across the country.

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Appendix A: List of UNC System Libraries

1. Appalachian State University. Belk Library website: (http://library.appstate.edu/)

2. East Carolina University. Joyner Library website: (http://www.ecu.edu/cs-lib/)

3. Elizabeth City State University. G.R. Little Library website: (http://www.ecsu.edu/library/)

4. Fayetteville State University. Charles W. Chesnutt Library website: (http://libguides.uncfsu.edu/content.php?pid=501491)

5. North Carolina A&T State University. FD Bluford Library website:(http://www.library.ncat.edu/)

6. North Carolina Central University. James E. Shepard Memorial Library website: (http://web.nccu.edu/shepardlibrary/)

7. North Carolina State University. North Carolina State University Libraries (http://www.lib.ncsu.edu/)

8. UNC Asheville. Ramsey Library website: http://library.unca.edu/

9. UNC-Chapel Hill. UNC Chapel Hill Libraries website: https://library.unc.edu/

10. UNC Charlotte. J. Murrey Atkins Library website: https://library.uncc.edu

11. UNC Greensboro. Jackson Library website: https://library.uncg.edu/

12. UNC Pembroke. Mary Libermore Library website: http://www.uncp.edu/academics/library

13. UNC Wilmington. UNCW Randall Library website: https://library.uncw.edu

14. UNC School of the Arts. Semans Library website: http://library.uncsa.edu/

15. Western Carolina University. Hunter Library website: https://www.wcu.edu/hunter-library/

16. Winston-Salem State University. CG O'Kelly Library website: https://www.wcu.edu/hunter-library/

17. NC School of Science and Mathematics. NCSSM Library website: http://www2.ncssm.edu/library/home

Appendix B: Interview Guide

1. What is your job description?
2. When did your library decide to implement Google Analytics for your library's website?
    a. Did you consider any other web analytics solutions?
3. Why did your library decide to implement Google Analytics? What were your KPIs (Key Performance Indicators)?
    a. Did your KPIs change at all over time?
4. How involved were you in the process? What were your responsibilities?
5. What were some of the benefits your library saw in implementing Google Analytics?
6. Where were some of the challenges your library faced in implementing Google Analytics?
7. Who normally gets to decide what goes on the library website?
8. Who normally is responsible for drafting your library's privacy policy?
9. Who has access to the Google account(s) used to run Google Analytics

10. If you wanted to implement new features to the library website, which library employees would have to approve the implementations of these new features?
11. In what ways did the implementation of Google Analytics affect your library's privacy policy?

Appendix C: Phone Recruitment Script

ME: Hi, my name is James Moore and I am a Masters Student at the University of North Carolina at Chapel Hill. I am doing my Master's Thesis on the effect that implementing Google Analytics has on the privacy policies on academic libraries. Would you be interested in participating in my study by doing an in-person interview? Of course, your participation in this study is completely voluntary. If you consent to the interview than your answers will be anonymized.

If the interviewee isn't interested:

ME: Not a problem. Do you know of anyone else involved in your library's use of Google Analytics who would be interested in conducting an interview?

If the interviewee consents to the interview:

ME: Great! Thank you so much for agreeing to an interview. Would you like to exchange emails and set up a time to conduct the interview? Also, do you know of anyone else involved in your library's use of Google Analytics who would be interested in conducting an interview?

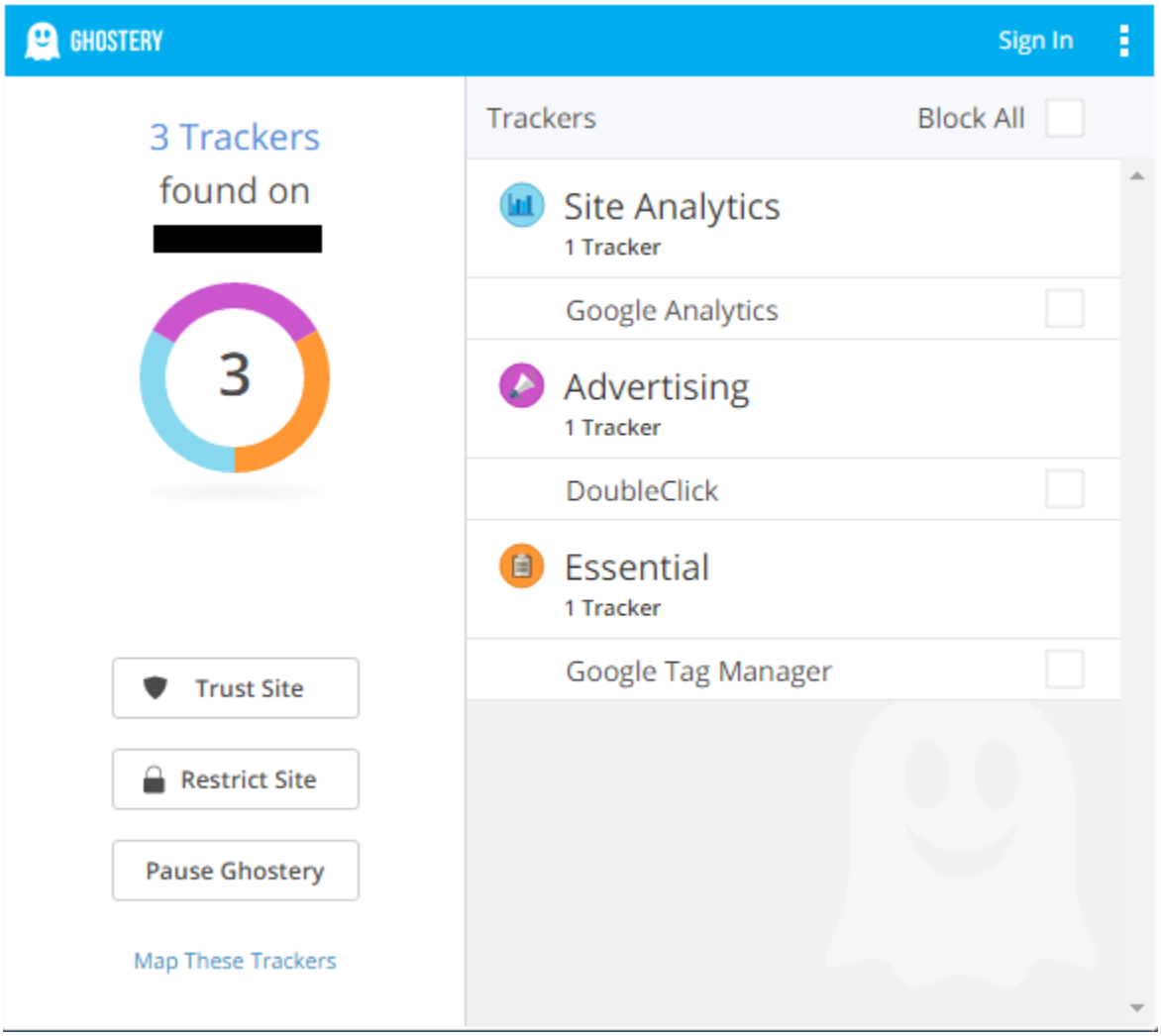
Appendix D: Google Analytics JavaScript Tracking Snippet

```
<!-- Google Analytics -->
<script>
(function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){
(i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o),
m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m)
})(window,document,'script','https://www.google-analytics.com/analytics.js','ga');

ga('create', 'UA-XXXXX-Y', 'auto');
ga('send', 'pageview');
</script>
<!-- End Google Analytics -->
```

(https://developers.google.com/analytics/devguides/collection/analyticsjs/#the_javascript_tracking_snippet)

Appendix E: Sample Ghostery Report



Appendix F: Google Analytics Terms of Service Section 7

"7. Privacy

You will not and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection of information from Visitors. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies that are used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a Visitor is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the Visitor's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features (e.g., an opt-out) that are part of the Service.

You may participate in an integrated version of Google Analytics and certain DoubleClick and Google advertising services (*"Google Analytics Advertising Features"*). If You use Google Analytics Advertising Features, You will adhere to the Google Analytics Advertising Features policy (available at support.google.com/analytics/bin/answer.py?hl=en&topic=2611283&answer=2700409) Your access to and use of any DoubleClick or Google advertising service is subject to the applicable terms between You and Google regarding that service.

If You use the GA 360 Suite Home, Your use of the GA 360 Suite Home is governed by the Google Analytics 360 Suite Home Terms of Services (or as subsequently re-named) available at https://360suite.google.com/terms (or such other URL as Google may provide) as modified from time to time (the "Suite Home Terms"), but subject to Section 2 of the Suite Home Terms, use of the Service will continue to be governed by this Agreement." (Google 2016)