This study describes eight one-on-one interviews of UNC-Chapel Hill undergraduate students about their digital photograph collection. Analysis of the interviews explores how participants manage their personal digital photographs and the influence of social media on their collection management. The participants discussed why they post photographs to social media, why they delete photographs from their devices and social media, and how they transfer photographs between their multiple devices. They also discussed their photograph management through the lifecycle of a photograph, from capturing, editing, sharing, and storing an image on their devices. The social media sites used by the participants included Facebook, Instagram, Twitter, Google+, and Picasa.

Headings:

Personal Information Management

Personal Photograph Management

Digital collections

Social Media
PERSONAL DIGITAL PHOTOGRAPH MANAGEMENT AND THE IMPACTS OF SOCIAL MEDIA

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A Master’s paper submitted to the faculty of the School of Information and Library Science of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Science in Information Science.

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Approved by:

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Introduction

The purpose of this study is to understand how university students manage their personal digital photographs. This includes the challenge of managing photographs across multiple devices and the influence of social media websites on their personal photograph collections. The devices include: cameras, smartphones, tablets, and laptops. I conducted eight one-on-one interviews with students with their devices present with the goal to gain a better understanding of their personal photograph management techniques and strategies.

Personal photograph management is a subset of personal information management. Personal information management (PIM) is the management of information or data about me, created by me, used by me, and managed by me (Jones, 2001). In turn, this means that personal photograph management is the management of photographs about me or created by me. PIM is emerging as an important research area with multiple topics of investigation (Barreau et al., 2008; Jones, 2001). PIM of photographs can become complicated because it may include photographs managed by the user and used by the user, as well as images not created by the user or about the user. In this study, students were only asked about photographs that they appeared in or created themselves.

As digital cameras and smartphones with cameras have become widely adopted, it has become easier to create and amass large digital photograph collections (Rodden & Wood, 2003). For example, if someone takes an average of 100 pictures per month on their phone alone, over the period of a year that creates a modest collection of 1,200 pictures.
This is not considering major life events like weddings, births, vacations, and graduations, which would significantly increase the number of photographs taken that year. Digital photography transformed the photography industry by dramatically decreasing the delay in turnaround for a viewable product and made it cheaper without the need for more special equipment (Platt et al., 2003; Ott et al., 2012). The downside is that the vast quantity of photographs can render users overwhelmed when trying to manage their personal collection (Platt et al., 2003).

Previous research in the area of PIM has focused on finding and refinding, Human-Computer Interaction, and the impact of PIM on personal time management (Barreau, 1995; Gao, 2011; Jones, 2005). In this research, I seek to provide insights into the area of digital photograph management and the influences of social media. This study provides evidence of photograph management trends between multi-device users, why users delete photographs from their devices, and how social media impacts their personal photograph management. This will contribute to the understanding of the field by providing information about how young users, who grew up with the Internet and smartphones, manage their photograph collections.

Social media websites like Flickr, Twitter, Facebook, and Instagram create new avenues of exchanging and storing photographs. Just between privacy policies and the ability to tag a name to a face, a lot of information is being shared with the online community. This study provides insights about how a particular subset of people – undergraduate university students – handle posting, deleting, and sharing photographs on social media sites when managing their personal photograph collection and what determines how these students to manage their photograph collection.
Literature Review

Personal Information Management (PIM) focuses on the storage, retrieval, and sharing of files and other interactional artifacts (Lindroth & Bergquist, 2008). The term “interactional artifacts” can relate to multimedia like photographs, videos, and music. There is less attention in the field of personal photograph management and practices (Al Nasar, 2013; Ames & Naaman, 2007; Jones et al, 2009; Platt et al., 2003). This literature review includes several articles relating specifically to photograph management but primarily discusses the potential relationship of other fields of PIM research to photograph management. There are two distinct areas of study being reviewed: photograph management and social media. In this day and age, as a result of smartphones and readily available internet access, there is a strong relationship between these two areas. This study is intent on furthering our understanding of this relationship.

In the overall research of PIM, finding and refinding of information and data has been heavily studied. Concepts from that research can be applied in the context of photograph management, specifically the “distinction between finding and refinding in personal space as opposed to shared space and how to design successful interfaces for both environments” (Barreau et al., 2008). In terms of photograph management, personal space can be defined as a personal laptop or external hard drive, while shared space relates to a social media site. Social media is a virtual community in which people share, create, and manage information and ideas. The relationship between social media and
personal, digital photograph management is very strong. People use social media to express their individuality, share life experiences, and connect with others. Social media websites like Facebook, Twitter, Instagram, Flickr, and Tumblr use photographs to emphasize this relationship. On a website like Facebook or Flickr, photos are shared and exchanged. This social interaction can influence the images that are uploaded and how they are managed. A user may censor or withhold photographs from a shared space if they consider the image to be unattractive or inappropriate, which is decided during the pre-sharing, edit step in the photograph lifecycle (Kirk et al, 2006). The concept of social censorship will later be discussed in greater detail in this literature review.

The concept of finding and refinding information is applicable to photograph management because in social media your name can be tied to an image. Examples include tags on Facebook, notes on Flickr, and @accountname on Twitter. Images not created by you but about you can be put out into the social atmosphere and it becomes a social expectation for a user to find these images on their own. “Downloading a photograph is usually the first and last activity performed with a digital photograph” (Ott et al., 2012), but once we introduce the classification of personal photographs, including photos taken of you by others then shared on social media, finding or refinding these photos becomes the necessary preliminary step.

Kirk et al. (2006) also studied the lifecycle of photographs from the moment the image was captured up until the sharing phase. Within the lifecycle of a photo there are three stages: pre-download, at-download, and pre-share. They discuss how, “the shift from paper prints to digital images has sparked a number of changes in people’s practices with their personal collection” (Kirk et al, 2006). With digital photographs there is the
added feature of editing digital photographs to change or improve the image. A photographer can take one picture, then crop, zoom, and sharpen the image during the pre-download or at-download phases before it is even permanently added to their collection. Digital photographs also have an advantage of browsing at any point in the stages of the photograph lifecycle. For example, digital collections allow for much easier browsing capabilities especially if the user’s goal is not well defined (Kirk et al., 2006; Rodden & Wood, 2003). Also, this shift of print to digital provides additional options for sharing. It is not necessary to print multiple copies of a photo to share it with multiple people. The user can just send multiple people the same email with the photo attached. Although, one downside to a digital photograph can occur when the user is backing-up their images. They found that there was a decline in the performance of the laptop storing the images as the photographs filled up the hard drive, which is a long-term concern for photograph management (Kirk et al., 2006; Rodden & Wood, 2003). While it might take up a lot of space, physical photograph collections do not negatively affect the objects storing them. Since the Kirk et al. (2006) study was conducted nine years ago, some of the limitations noted by the researchers may no longer prevalent (e.g. users’ unfamiliarity with digital cameras and lack of digital collections). Rodden and Wood (2003) mentioned that during their study digital cameras were still relatively uncommon, which is in sharp contrast to the participants in the current study who grew up with digital cameras and laptops in their homes at a very young age.

The owner of the photograph collection is usually the person taking the photos in the collection (Kirk et al, 2006; Rodden & Wood, 2003). When adding photographs into their collection they are able to remember the context in which it was taken and easily
group the related photographs. When the user is attempting to refind a specific image they may be able to recount the location. If the image was taken recently, this may be easily done. But as time goes on participants review their photos less frequently and begin forget context, such as, specific dates, names of locations, and names of people (Rodden & Wood, 2003). This makes it necessary for the user to have some sort of management technique, be it folders or searchable annotations. Rodden and Wood (2003) mentioned (1) the use of thumbnail displays for large collections and (2) sorting photos in chronological order as the most important features in the digital photo management software they were studying.

It is important to remember that not everything works in practice as when it is discussed in theory. Capra (2009) conducted a survey of current personal information management practices with a focus on cross-device information. In Capra’s survey (2009) many participants mentioned “having problems emailing large files, and some describe how they used email for small files and USB drives or CD/DVDs for larger files” or “transferring files by putting them on a shared network drive or server that is accessible from the computers being transferred among.” Specifically, the formats used by these participants involved using memory cards with cameras, using USB cables with digital cameras, and emailing files from a cellphone to a computer. While this survey considered shared networks provided by university servers, my study will investigate if social media websites are used as a shared network for photograph storage and transfers.

In the area of photograph management a distinction may be drawn between personal photograph collections as compared to large image databases (Platt et al., 2003). With a personal collection, the user may be able to recall the photographs that they took
and the individual context of each image. Also, they may recall details of their folder hierarchy and storage scheme. In a perfect management system, sharing and organizing personal photographs would be as effortless and convenient as watching a movie, allowing the user to feel entertained rather than toiling through the system (Ott et al, 2012).

Platt (2003) openly remarks on the need for additional research in the area of personal photograph management and contributes to this field with an application for automatic clustering of images into a table of contents, PhotoTOC. It is a combination “overview+detail” design where the collection automatically generates a cluster of images (album) based on time of creation and color. “PhotoTOC is the first automatically organized media browser that has scored reliably higher in subjective satisfaction than browsing with the user’s own folder structure.” (Platt et al, 2003) The overall goal of PhotoTOC is to use an algorithm to identify events in a person’s collection. Platt’s argument for not always following the timestamp on a photograph was primarily how often camera clocks are inaccurate. In the last decade there has been significant improvement with that feature. All products timestamp their images differently, but in the case of smartphones, tablets, and other Wi-Fi enabled technologies, the internal clocks are regularly matched to the current time zone and universal clock. This prevents travelers who move between time zones from needing to frequently update their devices to the local time.

Additionally, these “smart” devices create their own metadata and tagging features for use on social media sites like Flickr and for improving retrievability on a laptop or desktop (Ames & Naaman, 2007). In contrast, at the time of this writing,
Facebook strips all uploaded photographs of the exif data. This can give the uploader additional privacy and control over content. Also, Jones et al. (2009) argues that users believe that, “placing images in folders gives users a sense of control that tagging does not,” which may provide additional impressions of control over personal data.

Digital organization places different values on features in comparison to physical organization. Control, browsing, and integration are the most important aspects of a digital space. A particularly notable benefit of digital organization is the ability for files to be in two places at once. Images, documents, and videos can be copied and pasted into a new folder filled with only the relevant files of that project, album, etc. Allowing a user to have more control over their files, better access to browse, and easy retrieval of relevant photographs creates an ideal system for some users. However, applying this seamless system to personal photographs becomes more complex with the addition of social media websites where social interactions influence user behavior.

In many cases our personal organization is socially constructed (Ames & Naaman, 2007; Jones et al., 2009). Social considerations are an important influence on individuals’ management of information. These are the same considerations that occur when you clean your house right before guests visit or organize a folder before sharing it with a group. Social media sites like Flickr and Facebook, which allow users to tag individual faces of people in an image, induce these social considerations in the photo uploader. It becomes the uploader’s responsibility to provide data including location, captions, and tags for the enjoyment of the potential viewers. If the uploader does not provide this data it falls to the viewers to post comments and tag themselves or others. A potential result is that the album or collection of photographs becomes highly annotated
and detailed on the social media site. In comparison, the personal camera, smartphone, or hard drive becomes “a source of guilt and foreboding” (Jones et al., 2009) because these devices have not been managed or organized.

This may also occur with private information (not socially shared or posted online) which may receive fewer annotations and less organization because the user is not socially pressured to do so (Jones et al., 2009). As the subject of one study described, “I would like to say that because I am held accountable to tell you something each week, I’m probably moving forward on this at a greater rate than I would have otherwise” (Jones et al., 2009). Jones et al. (2009) developed a term for this type of motivation and social consideration – the “tooth-brushing effect.” Essentially, we are initially motivated by the social aspect and for the sake of appearance, but in the long run we personally benefit.

Al Nasar (2014) provides a recent literature review that highlights many potential avenues of personal photograph management research. Factors affecting personal photograph management include: the role of a keeping strategy, classification and annotation benefits, and how user memory influences user behavior. My study addresses many of these factors by asking questions about storage of digital collections, social media management, and social influences on photograph collection management. These questions will include the following:

- How do people (with a focus on university students at UNC-Chapel Hill) manage their personal digital photograph collections?
- Why do they do what they do?
- Has the “tooth-brushing effect” carried over to social media and shared devices for personal photographs and their digital collections?
The overall objective of the study is to elaborate on research addressed by Ott et al. (2012), who argues the following based on their research: (1) sharing images is the primary motivation behind photograph management, (2) chronological arrangements allow for easier finding, and (3) zoomable browsers improves usability and user experience (Ott et al., 2012). In addition, my study explores management techniques for the deletion of photos, removal of photos from social media sites, and copying photos from someone else’s social media photo collection for their own personal collection.
Methodology

In order to study personal photograph management and the impacts of social media, I recruited undergraduate university students. I contacted them through the university listserv and interviewed the students with their photograph management devices present. I used inductive coding to analyze my qualitative results.

The Sample

After IRB approval, I began recruiting research subjects using the opt-in massmail university listserv for undergraduate students. I also contacted several large schools/departments within the university to recruit participants. My intended participants were students between the ages of eighteen and twenty-five, excluding graduate, professional and doctoral students, as well as faculty and staff; see Appendix A for screening questionnaire questions. This age and academic group of students is an easily accessible pool of participants, and are believed to be regular users of social media and photograph management devices. The lack of using social media or using previously unknown social media sites did not disqualify a student from participating. In fact their reasoning for not using the popular sites (e.g. Facebook, Instagram, Twitter, etc.) would have been noted and incorporated into the results.

Through email, I explained the purposes of my study, the expected time commitment, and their personal roles. Those interested in participating in the study completed a short screening questionnaire asking: age, geographic location, school year,
department, and devices used. Based on the information provided by the screening questionnaire I was able to find eight subjects willing to participate in the one-on-one interviews. Additionally, I used the screening questionnaire to track demographic information.

Data Collection

I based my methodology on semi-structured interviews, similar to those conducted by Ott et al. (2012), with a sample of participants from various academic backgrounds. The primary objective was to understand the overall strategies and techniques involved in answering the questions: what do people really do with their digital photographs and how do they do it?

To begin data collection, I coordinated private, one-on-one interview times at Manning Hall with the individual students through their university email. The day before the interview I sent an additional email prompt reminding them to bring all their photograph management devices and again explaining the purposes of my study, the expected time commitment, and their personal roles.

Before the interview, the subjects signed informed consent forms that described the study, the data collection methods, and how the data would be used (see Appendix C). Using one-on-one interviews allowed me to pursue any interesting or relevant avenues of photograph management brought up by the subject. I was able to ask for specific examples of their photograph management and the specific impacts of social media on their photograph management practices.
Data Analysis

After completing the interviews I created an outline for each interview, and highlighted the subject’s responses. I used inductive coding on each question according to their responses. For example, for the question “why do you put photographs on social media sites?” one participant responded “because I want to share photos with friends and family, because my friends post, so I feel I should too, because I have family far away who I want to share my life with, and in case something happens to my laptop I know they will be safe on Facebook.” I then analyzed this response into four codes: share with family and friends, reciprocity, distance, and backup-storage. Once all the interviews were coded I grouped the responses based on categories, such as: reciprocity, distance, convenience, and audience-based. From these categories I surmised: (1) subjects like to have photograph stored on multiple devices in case of data loss, (2) they need larger storage space on their devices to accommodate their photograph taking practices, and (3) they use social media as a form of keeping in touch with family and friends, posting photos based on who will be able to access them. Based on my analysis of the responses, I gained insight into how people manage their personal photographs and the relationships between their photograph collections and their social media profiles.
Results

Quantitative

For this study I had eight participants (seven female, one male) consisting of undergraduate students from the University of North Carolina at Chapel Hill. There was one first-year student, four sophomores, one junior, and two seniors. During the preliminary portion of my study, when participants signed up to be interviewed, I asked them to estimate, across all their devices and online accounts, approximately how many digital pictures they had. During their one-on-one interview we established actual number of photos in their digital personal photograph collection by adding up the number of photos on their phones and computers. The number of photos stored on a phone were listed in the different folders based on the application in which the photo was used. The number of photos stored on a laptop were listed in iPhoto or counted in the Window users Picture folder. I found that many of the participants dramatically underestimated the size of their personal collection.

Figure 1 shows the number of photos that participants’ self-reported (orange) in comparison to how many photos the participants actually had (blue). For example, only one participant estimated that they had more than 5,000 photos whereas three participants actually had over 5,000 photos. Also, two people self-reported the number of photos they had ranged from 100-1,000 and another two self-reported photos ranging from 1,000-
2,000, when in fact all eight participants had at least 2,000 photos. Many participants were surprised by how many photos they had on social media sites.

**Figure 1. Comparison of actual and self-reported photo quantity.**

To further establish the demographic of the participants I noted types of devices into categories: computer, phone, and other (Table 1).

**Table 1. Devices based on participant**

<table>
<thead>
<tr>
<th>Devices:</th>
<th>Computer</th>
<th>Phone</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Apple*</td>
<td>iPhone</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Lenovo</td>
<td>iPhone*</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>Apple*</td>
<td>iPhone</td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>Lenovo*</td>
<td>Android</td>
<td></td>
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<tr>
<td>P5</td>
<td>Apple*</td>
<td>iPhone</td>
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</tr>
<tr>
<td>P6</td>
<td>Apple*</td>
<td>iPhone</td>
<td>iPod</td>
</tr>
<tr>
<td>P7</td>
<td>Apple*</td>
<td>iPhone</td>
<td></td>
</tr>
<tr>
<td>P8</td>
<td>Apple</td>
<td>Android*</td>
<td></td>
</tr>
</tbody>
</table>

*Primary Location*
Also, Table 1 is marked to show which devices the users described as their primary photograph collection location – where they look first for finding photographs or the location of the majority of their photos.

When asked which social media sites they use, all eight participants stated they use Facebook, six used Instagram and Twitter, two used Google+, and one actively used Picasa. Another participant had Picasa on their computer, with photos stored inside, but that was due to the computer automatically syncing Picasa with her iPhoto. She never used it and forgot it existed until this study. Each participant counted up the number of photos they uploaded to each social media site (Figure 2).

**Figure 2. Number of Photos on Social Media**

Twitter and Instagram provided an exact number of images posted, while Facebook was counted using the “Albums” page. The number of photos in each album was clearly marked under that album title, and added together. I found that the number of photos on Facebook varied across the participants. In contrast, four out of six users of Twitter explained that they had less than 100 photos uploaded, specifically less than 10. I believe that one of the reasons Facebook has larger numbers than Instagram, which is a social
media solely focused on photographs, is the age of the accounts. Once Instagram has been used as long as Facebook, the numbers may reflect a higher photo count.

I also asked participants to separately total the number of photos stored on their devices (Figure 3).

Figure 3. Number of Photos Based on Device.

![Number of Photos on Devices](https://example.com/figure3.png)

All devices had more than 100 photos stored on them. Every device type had at least one occurrence of the number of photos range: 100-1,000. All eight of the participants in this study had photos stored on multiple devices.

**Qualitative**

**Photograph Collection Management-Primary Location:**

When asked how they manage their personal collection, I specifically asked the participants where they felt the primary location of their photograph collection was located. Primary location means the location of the majority of their photos or the first place they look when refinding a photo. Six out of eight participants described using their laptops as their primary location. Out of those six, five had Apple laptops and used iPhoto to browse and organize their collection. For example, one participant said her
laptop was for storage so she knew all of her photos were there, but her phone was used more dynamically and contained the most important and most recent photos. The one PC user that describes her laptop as the primary location of her collection, P4, used Google+ and Picasa to manage her photos. One of the Apple laptop users also used Google+ as a location to store photos but they were automatically synced from her iPhoto account, so they were considered more for backup storage than a primary location for photograph management.

Two participants said they used their phones as their primary location for photograph management. One participant used her iPhone as her primary location, but also described taking a lot of “artistic or creative” photos with a Canon camera. She stored the SD cards in physical folders, similar to the old-fashioned non-digital photograph collections, in albums based on the year the photos were taken. She clarified that she stored them in the physical folders because it was the best way she knew how to manage several physical SD cards when she started the collection. She estimated that there are 1,000-2,000 worth of photos stored on the SD cards and they followed a specific theme, “trees and stuff”, that she described as artistic and not for sharing with the public. These photos were not backed up on the computer or online. Another participant used her Android phone as her primary location because it automatically separated the photos based on date. Although, she explained that if she was looking for a photo past a certain date, she would check Facebook first.

**Photograph Collection Management-Techniques:**

In addition to asking about their storage locations for photos, I asked the participants to describe their overall management style for their photo collection. The
process began with the participant opening their preferred device and the software they use to store their photograph collection. Then, they walked through an example of adding photos to their collection, and refinding a photo from a previous session.

Two participants preferred their smartphones for managing their photograph collection and used the default settings of the phone to manage the storage of their images. Photos were stored in albums based on the application used to create the image, e.g. Camera Roll, Snapchat, Instagram, then placed in chronological order. This allowed for the participants to refind a photo easily based on the application and thumbnail browsing. These two participants stated that the only photos on their laptops were old and not regularly visited, and if they were looking for something old they would check Facebook first anyway. One participant’s laptop collection only contained photographs taken on her old smartphone, and she stored them in the same folders as the phone. For example, she had folders named “Camera Roll”, “Snapchat”, “Instagram”, and “Videos”. The other participant placed all of her photos directly in the Windows automated “Pictures” folder, located under “My PC” with “Documents”, “Music”, “Videos”, and “Desktop”, without any file names or substructure. These two participants were able to quickly present their smartphone photograph collection, but struggled with their laptop collection.

The other six participants preferred their laptops (five Apple, one PC) for managing their photographs. All of the participants with Apple laptops used iPhoto as their photograph management software. It came installed on the laptop and asked to open when an iPhone was linked with the computer. iPhoto allowed users to create albums and tag people. It also created automated folders such as, “Last Imported”, “24 Months”, and
“Places” (based on geolocation metadata). Four participants used iPhoto create their own albums. All four created albums based on events, and two of them also used dates in the album names (e.g. “10/31/2013”, “Winter 2014”). The two others used names of vacations and occasions (e.g. “Fall Break” and “Prom”) as album names. Another participant did not use albums and instead used the automated folders “Most Recent” and “24 Months” to manage her photographs. One of the four participants who created their own folders mentioned they also used the automated folders, but established personal albums for specific events and favorite photos.

The only laptop preferred-PC user, P4, had her phone automatically synced with Google+. Lacking any form of personal organization, she allowed Google to organize her photos. Because her phone was automatically synced with Google+, P4 could easily delete photos off her phone, comfortable with the knowledge that they would be recoverable online. The photographs she directly stored on her laptop were organized into folders. These folders were divided into four categories: year, event, season, and miscellaneous. The miscellaneous folders were given nondescript or “hodge podge” names, such as: crash, dk, fun, Google. She explained that these names are completely random and never had anything to do with the actual photos stored in them. There were a few photos not designated to folders which she explained have a specific purpose, like a LinkedIn profile pictures, that was uploaded as an individual photo rather than part of a series. P4 said that the purpose of the photo dictated how she managed it. For example, if she took a photo and decided to post it online, the image would stay on her phone. In comparison, if the she was going to email it to a group she would email it to herself, download it to her computer, and then email it to the group from her laptop.
Refinding:

All participants reported using some form of browsing when attempting to refind a photo. Five participants reported using their memory about when the picture was taken to help them establish where to look for the picture on their phone or laptop. They remembered the season (e.g., look for snow or flowers marking winter or spring), holidays (e.g., a series of firework pictures marking 4th of July), or events (e.g., high school graduation marks June). They then used those markers as context clues when they attempted to refind a photograph while browsing in a large collection. Two participants described using the time stamped groupings provided by iPhoto when browsing for a photo on their laptop.

One participant did not use the time stamps associated with the photos, but browsed album by album, scrolling through each group of photos until she found the photo she was looking for on her laptop. Another participant liked general browsing for refinding a photo. She would open the main photos tab in her laptop, which showed all photos stored in iPhoto, and slowly browse through all of her pictures.

When attempting to refind a photo within her collection, P4 initially went to Picasa on her laptop, mentally figured out the time period in which the photo was taken, found a folder marking that time period, and then browsed within the folder. If it could not be found in Picasa, she looked through the folders stored in her Pictures folder on her laptop, randomly clicked through the miscellaneous folders, keeping in mind where she knew it is not stored. Then, she searched Facebook on her laptop, looking through albums around the time period the photo was taken. Lastly, she browsed through Google+, on her laptop, as her “has to be there because it’s automatically backed-up,” location.
Transfer across devices:

With the desire for personal photographs to be available among multiple devices it is necessary for there to be a personal method for transferring the photos from device to device. All participants used their smartphone to take photos. It should also be noted that four of the participants used another device (three use a camera and one uses an iPod) to take additional photos. In this study seven out of the eight participants used the cord provided by the manufacturer to transfer photos from their phones to laptops. Four participants used the cord as a primary form of transferring data, while one used the wireless auto-sync option connected to their laptop with the cord as a secondary form of transferring. Only one participant did not report using any form of external device to transfer data. She used the wireless auto-sync option to connect her phone to an online photo storage service (Google+) and her laptop (Picasa). Her secondary form of transferring data was through email or uploading to a social media site to later copy the image to her laptop. Another participant used email as a secondary form of transferring, but only under special circumstances.

Why delete from device:

When a photo is deleted from a device the user must make an active effort to remove the images from the device. The participants in this study reported that they deleted their photographs for multiple reasons, chief among them loss of importance or relevance and needing the space. One reason for deleting photographs was for when the smartphone runs out of memory. In the interviews, five out of eight participants described times that they had deleted large quantities of photos from their phone to make more space available when they were low on memory.
Four out of eight participants mentioned how the importance or relevance of a photograph mattered in the lifecycle of the image. For some participants, once a photograph is considered out of date it is no longer important. For example, one participant took photos of a flyer to remind her of the date and time of an event. Once that event has passed, she planned to delete the photo. Also, some participants described how images slowly become less relevant over time, to the point that the participant decides to delete them. For example, two participants mentioned deleting old high school photos. They were saved for a few years after high school graduation, but as time went on the participants found themselves less attached to the photographs, feeling they weren’t relevant to their life anymore.

Also, quality of the image can influence whether or not the image is deleted. If the image was blurry or off-center, during the browsing stage of transfer or immediately after taking it, the image might deleted due to these factors. A few of the participants described browsing through the photos on their phone before they were transferred to make sure they weren’t moving poor quality photographs into their computer photograph collection. Also, immediately after taking a series of photos, a couple of the participants described reviewing the images to make sure they came out well and that the ones that were blurry or off-center were deleted.

Why post to social media:

After asking about all the quantitative information pertaining to their photograph collection on devices and social media, I asked the participants why they put photos on social media sites. Based on their responses I identified are six main reasons: reciprocity,
distance, approval, bragging, convenience, and audience-based. In the following paragraphs I will generally describe the six reasons.

Seven participants described using photographs on social media to share their life with friends and family (distance). One participant noted that Instagram was for creative pictures, while Facebook was for events (audience-based). Only two participants had posted more than 100 photos on Twitter, but the predomin ate subject of the photos were memes or non-personal photos (flyers, propaganda, etc.). The six users of Twitter all described the lack of control over the content on Twitter, “I can control who’s my friend on Instagram and Facebook, but millions of people could see your pictures on Twitter” (P6) (audience-based). Participants noted Twitter’s usefulness as a method to “get the word out” and that it was a good place to share political or organizational photos (convenience). Two participants also explained that the intended audience of the photo influenced which site the photo was uploaded (audience-based). The participants described the difference in audience between Facebook, Instagram, and Twitter primarily based on age and access. Four of the participants described Facebook as a social media site for families and older people. In comparison, a few participants described Instagram as for artistic pictures and catered towards the younger generation. “I would post a picture of a good grade to Facebook for my mom, but people on Instagram wouldn’t care about that” (P5) (audience-based). One participant described how her social media was her personal space that allowed her to express herself and her personal preferences. “My pictures are of what I like and what I’m doing. There are different pictures for different occasions and each place (social media site) catered to that.” (P6) (audience-based).
Two participants said that having family in other states and countries and uploading photos to Facebook allowed them to share life events over a long distance \((\text{distance})\). Other participants noted that social media was convenient, “I don’t have to tell five people the same thing individually. I just post the picture and they can all see it” (P2), and “It’s easier than texting” (P6) \((\text{convenience})\).

When asked why they want to share things with their friends four participants explained that there was a level of bragging and approval seeking. This could occur in response to photos posted by friends or family. If a friend posted photos bragging about their life in some way, the participants would feel compelled to share photos in order to brag as well \((\text{bragging})\). Also, by sharing photos with friends and family they are giving their loved ones the opportunity to write positive and approving comments \((\text{approval})\). For example, two participants described wanting to show their friends and family how great their life is, the highlights of a vacation, and “to share cute pictures of myself.” Two other participants explained that they post pictures so other people could like and comment on them \((\text{approval})\). One further explained that her photos often carried a theme, “because people like that stuff” \((\text{approval})\). I believe this kind of information sharing is not unique to social media or photographs, rather the opposite. I believe based on social expectations everyone seeks approval and wants to brag about the positive things in their life, social media just makes it easier. This resonates with Goffman’s (1959) book, which describes this as a type of idealized performance where someone is celebrated for their performance and given the approval in which they seek.

Along with bragging and approval seeking, another socially constructed expectation that influenced photograph sharing on social media was reciprocity. Two
participants talked about posting photos to in response to another friend’s photo. For example, I want to support a friend that mutually follows up” (on Instagram) (reciprocity). Another participant posted photos to Facebook because, “My friends put their photos on, and so it’s one place to keep track of everyone’s photos” (reciprocity). Many times the participants felt socially obligated to post pictures from an event because it contained photos of their friends, whom they knew would want to be personally linked (reciprocity). Jones (2007) discusses the concept of obligation management, in which involves keeping track of the tasks that you “owe” others. In this case, it could mean the participants “owe” their friend pictures from an event, especially if that friend posted pictures of the participant at similar events in the past. As will be discussed later in the paper, this type of reciprocal posting also allows people to download pictures (taken and posted by others) of themselves at events.

Two participants described using social media sites as back-up storage in case of emergencies. As mentioned earlier, P4 automatically synced photos taken on her phone with her Google + account. This allowed her to delete photos from her phone, and access them anywhere with an internet connection. Another participant mentioned uploading all of her photos onto Facebook. Although she had almost 3,000 photos uploaded to Facebook, only a few albums are actually viewable to her friends. She uploaded the photos, then made them only viewable to her. This way if anything happened to her laptop or phone, all of her photos would be saved on Facebook. Also, every couple of months she went through her public albums and made individual photos only viewable to her. This made it so that her friends could not see old photos no longer relevant to her social media persona, but maintained the online storage as a back-up.
**Copied from social media:**

The participants were also asked if and why they copy photos of themselves from the social media sites of other people to save them into their personal photograph collection. All of the participants described copying photos in which they appeared. Three described situations in which their friends took photos of an event and uploaded photos in which the participants looked attractive. Another participant described that she tagged herself using Facebook in order to link the photo to her personal account, and if she really liked the photo she would save it directly to her phone. One participant mentioned saving photos directly to her phone or taking screenshots of the photo on Instagram. Two participants described copying photos they found funny and that they might want to share within their social circles. Two others said they had copied photos including old family photos of themselves or photos of new family members (babies, pets, marriages). One participant used the copied photos for personal scrapbooking. Another participant believed that it is important when pulling photos from another persona’s social media site that they receive credit for the quality of the photo by maintaining their watermark.

**Removed photos from social media:**

I asked the participants if they ever removed or deleted photos off their personal social media sites. Five out of eight participants said they deleted photos because they were old. They mentioned middle school and high school as a specific timeframe to be considered old. For one participant, old photos also included people that are no longer in her life or photos when she looked young and naïve. Three participants mentioned they would delete photos if they personally looked unattractive. One participant would
randomly go through her Facebook photograph collection and delete entire albums at once in order to dispense with albums she didn’t like anymore. Two participants mentioned removing photos in which they were engaged in illegal activities like underage drinking. Another described taking down a selection of photos because no one liked or commented on them. If people didn’t enjoy the photo or acknowledge it in some way, she would remove it, resulting in albums where all the photos are appreciated through likes. Another participant described taking down photos she posted the night before which were, in-hindsight, inappropriate or regrettable.

**Ask to remove from social media:**

To follow up the previous question, I asked the participants if they had ever requested for someone else to remove a photo from their social media site. All of the participants automatically associated the question with Facebook. Six participants said they had never asked someone to remove a photo of them. One participant said, “I’ve disliked them, but it’s their personal space”. As an alternative, four participants explained that they untagged themselves from the photos they found undesirable. One participant described how she never asked someone to remove a photo because she enacts self-censorship when she was in situations she didn’t want her photo taken. This censorship consisted of putting her hand up to block her face in the photo or turning away from the camera.

Two participants responded that they have requested for photos to be removed. One of the participants asked from photos to be removed because it appeared they were underage drinking and family members were concerned. Another participant explained how she asked her boyfriend’s ex-girlfriend to remove old romantic photos of them.
together because it upset her. She did not want anyone looking through his old photos and think he was still with his ex-girlfriend.
Discussion

A primary goal of this study was to investigate how people manage photos across multiple devices, and the influences social media has on their photo management. While trends cannot be confirmed due to the small sample size of the interview participants, I will discuss possible themes present in the data. The eight participants of this study come from an age group that may have had social media accounts since early adolescence (12-13 years old). Many of the participants described setting up personal social media accounts in middle school. They grew up in a time where photographs can be shared and spread throughout the internet and world at the click of a button.

An initial theme found among the participant’s responses involves duplicating copies of photographs from devices and social media sites in order to preserve the photo in their personal collection. Participants copied photographs from the social media accounts of friends and family to their smartphones or laptop devices for multiple reasons, one of which was so they could ensure access to a photograph they wanted. For example, two participants described creating physical photo albums containing photos from their digital photograph collection and photos copied from Facebook. Additionally, three participants liked having the Facebook photos readily accessible on their phones.

Also, some participants would transfer photographs between devices or auto-sync their phones with software as a backup copy in case the original photo was corrupted or
deleted. When asked about iCloud and other types of cloud storage (e.g. Google+), several of the participants, especially the Apple laptop users, expressed comfort in knowing their photos were always backed up online, even if they didn’t know how to access them. I believe this feature of smartphone and laptop technology allows this generation of users to become comfortable in the belief that all of their photographs are safe and backed-up online or elsewhere.

Another theme prevalent throughout the information gathered during this study reflects a respect and belief that social media accounts are a personal space. When asked if they had ever requested for an individual to remove a photograph from their social media site, the majority of the participants said no. One participant specifically commented that it was their friend’s personal space and not ‘their place’ to ask for a photograph to be taken down. Additionally, when asked if they had ever copied an image from another person’s social media page for their own personal use, one participant believed it was important that the photographers were respected for their work and given credit for the image by maintaining a watermark. While these participants are all university students, living in a college town, I wonder if this feeling of social media as personal space will continue past this age range.

Another theme related to social media as personal space, involves personal censorship of content. Several of the participants described a few of the steps and thought processes that occur during the pre-sharing phase, before a photo is posted to social
media. They were aware of the audience they have and the access available to the overall network of social media users. They were aware how quickly information can be spread online and how the information they post can impact their lives. While they mentioned restricting certain photos from Facebook because family and church members had access to their photos, they also had to keep in mind future employers and people with malicious intent. Although some social media sites now have features to support deleting or removing content, once pictures are posted, they may always exist somewhere else. For example, people can copy them before they are taken down. This circumstance was not addressed by the participants.

**Future Works**

At the conclusion of this study I have identified several additional areas of research for personal photograph management, specifically relevant to the impact of social media. During the interviews many participants mentioned audience-based sharing, where they tailored the photographs they shared based on who was the intended viewer. A few participants felt uncomfortable with the idea of uploading photos to Twitter because there was a lack of control over the viewers and distribution of the image. There is more to be learned about the practices and privileges surrounding social media privacy and how the settings available on the various sites may influence behavior.

Additionally, the participants shared their views about what an ideal photograph management system would include. Several of the participants described a system in which their phones or camera devices would automatically sync images and videos to their laptop computers, a feature which is available for many current devices. However, six users expressed some discomfort with the idea of storing images “in the cloud”, either
because of uncertainty about how to access or manage the photos stored there, and due to recent high-profile hacking situations. Despite this, many participants still relied on cloud-based backup storage in case their phones or computers were damaged or stolen. This illustrates a tension that users face between the convenience of auto-sync cloud storage versus the potential for information to be stolen or compromised.

One of the primary desires of the participants in this study, when asked if they would change anything, was greater storage capacity on their smartphones. In a perfect photograph management world, their phones would have unlimited storage for all of their photos and they would have access to those photos from any device. A few participants mentioned facial recognition software as a tool for helping them manage their photos, but were hesitant because it has yet to be perfected.
Conclusion

Managing one’s personal photographs has many benefits and challenges. The growing uses and functions of social media sites has influenced the way people share and exchange photos. This study provides insight into connections between social media and a personal photograph collection. The participants in the study, undergraduate university students, were asked about the management practices of their photographs across multiple devices and social media.

Based on the responses of my participants, I found that people post for a variety of reasons. They described the function of the website as influencing the content they post, e.g. Instagram was described for artistic/creative photos, Facebook for accomplishments, and Twitter for political or social organization propaganda. Also, participants’ viewed each social media website as having a designated audience. Instagram was described for friends, Facebook for family and friends, and Twitter for ‘the masses’ without any restrictions on access to content. Participants described consciously posting and deleting photos based on who the other users are of the social media site. Another reason participants described posting photos to social media is convenience. With social relationships already established between family members and friends, the participants explained that social media allows them to upload photos once and share with a large group of people. This process is easier than texting and they never
have to repeat themselves. Also, it allows them to fulfill the social obligation of reciprocity. They sometimes feel compelled to respond to other photos or posts made by friends and family, but posting also allows them to brag about their lives and receive approval from their loved ones in an environment tailored towards sharing life moments. Erving Goffman (1959) expresses similar ideas, describing the role of expression is conveying impressions of self and everyone has a specific impression they wish to make in order to induce a specific response.

This study also suggests that participants delete photos from their social media sites if they are considered irrelevant or outdated. When an undesirable photo is posted by someone else and linked to the participant’s account, they may untag themselves rather than ask for it to be permanently removed. In contrast, when the participants found photos of themselves posted by friends that they liked or wanted to add to their personal collection, they tagged themselves or copied the photos onto one or many of their devices. This study also highlighted how there are different reasons behind deleting photos off social media sites and personal devices. In comparison to the reasons previously stated for deleting photos from social media, the participants describe deleting photos from their personal devices primarily to create more storage space and because the photo is no longer relevant.

All the participants had at least two storage locations for their photos: a computer and a smartphone. The smartphone stored photos taken by the device and occasionally photos copied from social media or other online accounts. Six participants used their laptop computers for their primary storage location, migrating photographs from their smartphones using a USB cord or by emailing them, thus accumulating all of their photos
onto one device. Also, three of the participants used an automatic syncing technique to insure all of their photos are copied to one location, as a backup, in case they were to accidently delete a photo from their smartphone.

The participants described their management techniques for each device. When managing the photograph collections maintained on their smartphones, all eight participants used the operating system of the phone to dictate how the photos were managed. The participants did not report downloading special software or applications to manage their smartphone photos. The phones had folders based on the application in which the photo was taken (e.g. Instagram, Snapchat, etc.) or stored in the camera in chronological order. The management techniques for the photograph collections on their laptops widely varied. Not everyone created albums to organize their photos. Many used the default software of their laptop’s operating system (e.g. Apple laptops use iPhoto) and that software’s automated folders. The participants that generated their own albums created a combination of albums named after events and dates.

The overall conclusion of this study has revealed that there is a difference between a social media photograph collection and the photograph collection stored on personal devices. Each social media site and device is managed differently based on the function and intended purpose. There was no general consensus on a perfect management system for photograph collections, but this study suggests that social media has impacted photograph sharing and handling on personal devices (computer and smartphones). This is in part because everyone has different wants and needs for their photograph management system, making a universal perfect system very difficult to design. There is
potential for future research on photograph management and social media based on privacy and syncing devices.
Bibliography


Appendix A

Screening Questionnaire:

- Are you willing to participate in a 30-45 minute interview about your personal picture management?
- What year were you born?
- What is your year in school?
- What is your major?
- What types of devices do you store digital pictures? Check all that apply:
  - MAC laptop
  - PC laptop
  - Smartphone
  - Tablet
- Across all your devices and online accounts, approximately how many digital pictures do you have?
  - less than 50
  - between 50 and 100
  - between 100 and 500
  - between 500 to 1,000
  - more than 1,000
- Best way to contact you? Email address: ____________________
Appendix B

Interview questions:

- How long have you had this device?
- Where do you store photographs
  - Phone, tablet, laptop, Cloud, external hard drive
- How do you transfer photographs across devices?
- Do you have photographs on social media sites?
  - Rank the following social media sites based on quantity of photographs stores
    on: (1=most, 6=none or N/A)
    - Facebook
    - Instagram
    - Tumblr
    - Google+
    - Twitter
    - Other (which site?)
  - For the social media sites you use, approximately how many photos do you have uploaded?
  - For the social media sites you use, how often do you post photos?
    - Daily
    - Weekly
    - Monthly
    - Every couple of months
    - Once a year
    - Never
- Why do you put photographs on social media sites?
• Have you ever copied a photo off of someone else’s social media site? Why?

• Have you ever removed a photograph off a social media site? Why?

• Have you ever asked someone to remove a photograph of you off a social media site? Why?

• How do you manage your online collection?
  o create albums/events
  o tagging
  o based on events
  o primary location

• Walk me through how you would add a handful of new photographs to your collection. Why do you do it that way?

• How would you refind a photograph? Show me.

• Why do you delete photos off your device?

• How where do you have problems managing your photograph collection?
Appendix C

Adult Consent Form:

University of North Carolina at Chapel Hill

Consent to Participate in a Research Study

Adult Participants

Consent Form Version Date: _____________

IRB Study # 14-2826

Title of Study: Personal Digital Photograph Management and the Impacts of Social Media Interviews

Principal Investigator: Becca Solomon

Principal Investigator Department: School of Information and Library Science

Principal Investigator Phone number: 919-548-5599

Principal Investigator Email Address: solomonr@live.unc.edu

Faculty Advisor: Robert Capra

Faculty Advisor Contact Information: 919-962-9978

What are some general things you should know about research studies?

You are being asked to take part in a research study. To join the study is voluntary.

You may refuse to join, or you may withdraw your consent to be in the study, for any reason, without penalty.
Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study. You will be given a copy of this consent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

**What is the purpose of this study?**

The purpose of this research study is to learn about the personal photograph management techniques of undergraduate university students and how social media impacts those management techniques.

**How many people will take part in this study?**

There will be approximately 8 people in this research study.

**How long will your part in this study last?**

You will be interviewed for a period of 30-45 minutes.

There will be no follow up to this interview.

**What will happen if you take part in the study?**

During the interview you will be asked questions about how and where you store digital
photos, and how you manage your digital photos across different devices, web sites, and social media services. Based on your response, further questions may be asked. As part of the interview, you will be asked to show the experimenter how and where you store digital photos, which may involve logging into your social media and other online accounts from your computer, smartphone, or other devices.

Specific data like number of photographs on device and length of time with device will be collected as part of the analysis.

The interview session will be audio recorded and the interviewer may take typed or written notes.

There will be no follow up interviews or questionnaires.

**What are the possible benefits from being in this study?**

Research is designed to benefit society by gaining new knowledge. You will receive a $20 gift card for taking part and completing this study.

**What are the possible risks or discomforts involved from being in this study?**

The experimenter will ask you to illustrate how you store and manage digital photographs. This may involve showing some of your personal photos to the experimenter, which could be uncomfortable or embarrassing. If you are uncomfortable at any point, you may ask to stop the interview. You can skip any questions or parts of the interview that you do not wish to answer. There may be uncommon or previously unknown risks. You should report any problems to the researcher.
What if we learn about new findings or information during the study?

You will be given any new information gained during the course of the study that might affect your willingness to continue your participation.

How will information about you be protected?

Participants will not be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.

The information recorded during the interview will be stored on a secure, password protected laptop. The interviews will be separated from any identifiable information.

What will happen if you are injured by this research?

All research involves a chance that something bad might happen to you. This may include the risk of personal injury. In spite of all safety measures, you might develop a reaction or injury from being in this study. If such problems occur, the researchers will help you get medical care, but any costs for the medical care will be billed to you and/or your insurance company. The University of North Carolina at Chapel Hill has not set
aside funds to pay you for any such reactions or injuries, or for the related medical care. You do not give up any of your legal rights by signing this form.

**What if you want to stop before your part in the study is complete?**
You can withdraw from this study at any time, without penalty. The investigators also have the right to stop your participation at any time. This could be because you have had an unexpected reaction, or have failed to follow instructions, or because the entire study has been stopped.

**Will you receive anything for being in this study?**
You will be receiving a $20 in cash for taking part and completing this study.

**Will it cost you anything to be in this study?**
It will not cost you anything to be in this study.

**What if you are a UNC student?**
You may choose not to be in the study or to stop being in the study before it is over at any time. This will not affect your class standing or grades at UNC-Chapel Hill. You will not be offered or receive any special consideration if you take part in this research.

**What if you have questions about this study?**
You have the right to ask, and have answered, any questions you may have about this research. If you have questions about the study (including payments), complaints,
concerns, or if a research-related injury occurs, you should contact the researchers listed on the first page of this form.

**What if you have questions about your rights as a research participant?**

All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

**Participant’s Agreement:**

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

________________________________________________________________________

Signature of Research Participant Date

________________________________________________________________________

Printed Name of Research Participant

________________________________________________________________________

Signature of Research Team Member Obtaining Consent Date

________________________________________________________________________

Printed Name of Research Team Member Obtaining Consent