The Ownership and Reuse of Visual Media

Catherine C. Marshall
Microsoft Research, Silicon Valley
1065 La Avenida
Mountain View, CA 94043
1-650-693-1308
cathymar@microsoft.com

Frank M. Shipman
Department of Computer Science
Texas A&M University
College Station, TX 77843-3112
1-979-862-3216
shipman@cs.tamu.edu

ABSTRACT
This paper presents the results of a study of the ownership and reuse of visual media. A survey was administered to 250 social media-savvy respondents to investigate their attitudes about saving, sharing, publishing, and removing online photos; the survey also explored participants' current photo-sharing and reuse practices, and their general expectations of photo reuse. Our probe of respondent attitudes revealed that respondents felt: (1) people should be able to save visual media, regardless of its source; (2) people have slightly less right to reuse photos than they do to save them; (3) a photo's subject has a slightly greater right than the photographer to reuse the photo in non-commercial situations; (4) removal is controversial, but trends more positive when it involves only metadata (e.g. tags); and (5) access to institutional archives of personal photos is better deferred for 50 years. Participants explained their own reuse of online photos in pragmatic terms that included the nature of the content, the aim and circumstances of reuse, their sense of the photo's original use, and their understanding of existing laws and restrictions. In the abstract, the same general question revealed a 'reuse paradox'; while respondents trust themselves to make this judgment, they do not trust the reciprocal judgment of unknown others.

Categories and Subject Descriptors
H4.3. Information Systems: Communications Applications

General Terms
Design, Experimentation, Human Factors, Legal Aspects.

Keywords
Digital photos, social media, information rights, survey, reuse.

1. INTRODUCTION
As the Internet evolves, professionally created and curated visual resources (e.g. Corbis) are being supplanted in certain practical ways by personal photos and videos, visual material created and recorded by many different people with many different purposes. Media-sharing services such as Flickr, PhotoBucket, and Image Shack each host billions of photos; social media sites—in particular, Facebook—contain tens of billions more. In fact, according to the IDC annual survey, over 70% of the material on the Internet is now generated by individuals [14].

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One important issue introduced by personal visual media on the Web is ownership; the legal status and fair use of this easily copied and transmitted material has become murky, especially where it concerns reuse and archiving. Personal visual media is reused to a great extent, both as shared content passed around freely by friends, family, and colleagues, and as a resource for finding illustrations, examples, visual surrogates, and reference material. At the same time, no-one may assume responsibility for the material's stewardship. It is just there as a resource, subject to the benign neglect of individuals and reliant on the business models of free media-sharing sites and for-pay ISPs: no guarantees are made by anyone, and if one photo disappears, there's another one to take its place.

The purpose of the study described in this paper is to investigate questions stemming from the ownership of visual material, for example the rights of the photographer versus the rights of the photographed. We are also interested in how people understand reuse and copyright, including differences between attitudes and behavior, and practical limits of reuse.

This study is one of a series of studies to examine different aspects of social media ownership among Internet users, including attitudes about saving, sharing, publishing, and removing shared media on the Web. In this survey-based study, in addition to looking at attitudes, we also focus on participants' practices and experiences sharing and reusing visual materials. Digital photos and videos are an increasingly common part of the social Web, and people have developed their own complex systems of values that impose limits and constraints on what they (and others) can and cannot do with media they don't own.

This paper first describes the details of the study—how the survey was constructed, how participants were recruited and screened, and how the data was validated—and goes on to describe the survey's respondents, their demographic characteristics and how they use the Internet. Next we discuss results from the two main segments of the survey: (1) a scenario-based probe of respondent attitudes, designed to yield quantitative data, and (2) a set of questions, some of them open-ended, designed to elicit qualitative accounts of visual media the participants have downloaded recently, as well as other aspects of their photo-sharing practices, and finally, their own formulation of what can fairly be reused. At the end of these results, we focus on apparent divergences between attitudes and practices. Finally, we summarize the study's findings, and discuss planned future work.

2. STUDY DESCRIPTION
This survey about the ownership and reuse of visual material (especially photos and videos) is the second part of a planned six-part study of social media ownership. The first survey concerned the ownership of Twitter content, and the results largely characterized respondent attitudes [12]. This survey builds on our

initial results, and greatly expands on them by supplementing the survey of attitudes with open-ended questions about the respondent's behavior. We found that respondents were willing and able to report on their own specific practices, as well as answer some abstract questions about reuse.

The 41 question survey is structured in three parts. The first part consists of 8 questions, two of them open-ended, which characterize the respondent and how the respondent uses the Internet. The second part consists of four closely related scenarios, coupled with 18 belief statements for respondents to assess on a 7 point Likert scale; three reading comprehension questions to ensure the respondent is reading the survey carefully; and three questions (one of them open-ended) to probe the respondents' understanding of ownership. Part 3 of the survey consists of 8 questions, 4 of them open-ended, that cover the respondent's own attitudes and practices. We also asked respondents whether they would be willing to participate in future studies. Because we administered the survey using Mechanical Turk, the infrastructure collected additional data such as work time and respondent ID, which allows us to track participants across surveys. The survey is described in more detail below.

We deployed the survey as a Mechanical Turk Human Intelligence Task (HIT) for two weeks, over which time we collected 250 surveys. After eliminating eight potentially suspect surveys (using the process we describe below), we were left with 242 completed surveys for our analysis.

2.1 Using Mechanical Turk

In recent years, researchers have been using Mechanical Turk in a variety of ways to reach a broad respondent pool [9]. These respondents have been found to generally reflect characteristics of US Internet users, albeit somewhat younger and lower income, with a greater proportion of females than the Internet-using population at large [7]. A well-documented set of best practices describe how to conduct such Mechanical Turk-based studies effectively, and validate participants' responses [8]. Our study adheres to these best practices for recruiting and screening participants, avoiding cheaters, and vetting the data so that any potentially suspect respondents are eliminated [4].

2.1.1 Getting good data

To qualify for the study, respondents were asked to be photo sharers located in the US who were native speakers of English. They were also required to have a 95% acceptance rate on previous Mechanical Turk HITs. We used these qualifications, coupled with two additional verification criteria (time spent on the survey and responses to reading comprehension questions) to ensure respondents took the task seriously and would furnish accurate data about their attitudes and practices. Participants were disqualified if they received more than one point (out of five possible points) when the following tests were applied:

1) Respondent is not a native speaker of English;
2) Respondent spent under 7.5 minutes doing the survey; and
3) Respondent answered any of three reading comprehension questions incorrectly (one point for each error).

We also went through our data by hand to verify the sufficiency of this formal five-point test. It is generally obvious when respondents are trying to game the system (e.g. by ignoring the screening criteria or checking off responses without reading the survey): in such cases, they tended to give minimal or nonsense answers to the open-ended questions. However, most respondents gave thorough, thoughtful answers to complicated open-ended questions (e.g., why they chose a specific method the last time they shared a photo). Even using these stringent criteria, we only needed to discard 8 surveys. Following recommended practice, all 250 respondents were paid (at a standard rate established for this type of task) even if their data was discarded.

2.1.2 Using scenarios to probe ownership attitudes

To probe respondent attitudes about the ownership of visual materials, we constructed a realistic set of related scenarios about the photo shown in Figure 1. By creating a detailed scenario, we hoped to ground the participants' responses in a situation in which they could draw on their own experiences. We gave the photo's subjects names (Janice and Jill, as labeled in Figure 1); we also created three characters visible in the photo's background (Figure 1's Beverly, Vivienne, and Kim). A photographer (Fred) took the photo in a fictitious venue, Club Midnight.

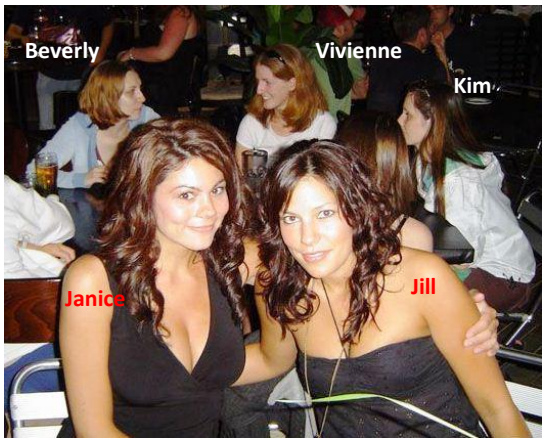

Figure 1. Scenario photo. Janice (left) and Jill (right) are in the foreground. At a background table are Beverly (left), Vivienne (center), and Vivienne's daughter, Kim (right).

Scenario 1. Fred, Jill, and Janice are at Club Midnight celebrating Janice's 25th birthday. Fred takes a series of photos, including the one shown in Figure 1. Visible at a nearby table are strangers Beverly, Vivienne, and Vivienne's 14-year-old daughter Kim. When Fred returns home, he emails the photo to Janice and Jill, and uploads it to his Flickr account, tagging it "Club Midnight."

Figure 2. Cropped photo that Vivienne has saved

Scenario 2. Fred's tag allows Vivienne to find the photo of herself at Club Midnight. She downloads the flattering photo, and uses an editor to crop out a small photo of herself (see Figure 2). Vivienne is recently divorced, and is engaged in a custody battle for her daughter, Kim. She would rather people (including her ex-husband) do not find out that Kim was with her in a nightclub.

Scenario 3. Club Midnight's management searches the Web for photos tagged with the club's name. They purchase photos they like for $10 each for use in the club's online publicity. They find the photo of Janice's birthday celebration on her Flickr account, on Fred's Flickr account, and on Vivienne's blog. Everyone looks to be having a good time, so they want to purchase the photo.

Scenario 4. The Library of Congress is acquiring the rights to the public Flickr photo collection as an important historical artifact; this would potentially give people the ability to view and reuse photos from the collection 'forever'.

Each scenario is followed by statements about actions characters take using the photo. These actions involve one of four data ownership terms, *save*, *share*, *publish*, or *remove*, which we defined at the outset of the survey to help respondents interpret them consistently. These definitions are shown in Table 1 (the statements themselves are shown in Table 5 with the results).

Table 1. Four data ownership rights used in scenarios

term	definition	example
Save	Store the content on your own storage media.	You might *save* a photo to your local hard drive or burn it to a CD.
Share	Make the content available to a limited set of friends or family members by using email or social media websites.	You might *share* a photo with your friends on Facebook.
Publish	Make the content available to the public by uploading it to a website like Flickr, Blogspot, or YouTube.	You might *publish* a story to your blog or *publish* a video to YouTube.
Remove	'Unpublish' content; to delete content from a public website.	You might *remove* a photo from Flickr if you don't want everyone to see it.

2.2 Participants

Survey participants reflect the US Mechanical Turk population, which in turn generally represents US Internet users, with the caveats mentioned in Section 2.1 [7]. The average work time on the study was 13 minutes, 21 seconds. Most respondents were in their twenties (64%) and thirties (17%); they were 71.5% female, 27.3% male, and 1.2% declined to state. Table 2 summarizes the respondents' age and gender.

Table 2. Respondents by age and gender

Year born	before 1950	1950-1959	1960-1969	1970-1979	1980-1989	after 1990	total
female	2	1	17	36	103	14	173
male	1	0	7	17	32	9	66
didn't specify	0	0	1	0	2	0	3
total	3	1	25	53	135	23	242

As in our Twitter survey, most respondents (221/242, or 91%) report completing at least some college; about one-third are currently students (82/242, or 34%). Table 3 summarizes respondents' education level.

Table 3. Participants' education level. 82 are students.

Education level	Number (%)
some high school	5 (2%)
high school diploma	16 (7%)
some college	88 (36%)*
associates degree	22 (9%)
bachelor's degree	80 (33%)
graduate degree	31 (13%)

It is interesting to compare respondents' characteristics with those of the people who completed our Twitter survey. Photo-sharers seem to be more numerous among Turkers than microbloggers are; this survey attracted more respondents over the same time period, and there were fewer potentially bogus responses. Furthermore, respondents completed a longer survey that included open-ended questions about their practices: the average work time on the Twitter survey was about 9 minutes, compared to over 13 minutes for the photo survey (for the same payment).

Although there was a small overlap in the respondent pool (which we could track by comparing Mechanical Turk unique ID numbers), we asked different questions in this survey, and it was administered several months later. The age, education, and Internet experience characteristics were very similar across the two populations, but the gender balance differed between the two surveys; 61% of the Twitter survey's respondents were female, while 71.5% of the photo-sharing survey's respondents identified as female (the US gender breakdown overall is about halfway between the two figures). We might infer that photo-sharers are more likely to be female than microbloggers are.

We gave participants a checklist of social applications (shown in Table 4) so they could report which ones they used; participants averaged between 5 and 6 social applications each. Although participants were screened on the basis of photo-sharing, not all checked the photo-sharing application, probably because they shared photos via Facebook or email, rather than via Flickr.

Table 4. Participants' online social applications

Activity	Number of respondents (% of total respondents)
Email	239 (98.8%)
Social networking	225 (93.0%)
Shopping	213 (88.0%)
Photo sharing	169 (69.8%)
IM/Chat	151 (62.4%)
Video sharing	145 (59.9%)
Twitter	84 (34.7%)
Videoconferencing	78 (32.2%)
MMOG	46 (19.0%)

In the open-ended responses that followed, many added other non-social online activities, such as working ("…I spend a lot of my internet time (about 2-5 hours a day) doing mTurk because I am a single Mom and I need the extra cash..." [R069]), doing research ("… [I] look for ideas for work (activities I can do with children at an after-school program)…" [R095]), using resources ("…I also use weight loss sites…" [R096]), participating in commerce ("…selling on eBay…" [R058;R089]), or reading ("…I'm looking at parts of the newspaper, like the obituaries…" [R118]).

Respondents also cited social activities we did not list, such as participating in online communities ("…I participate in artistic communities (like DeviantArt and Fanfiction.net)…" [R114] or virtual worlds ("…I also play in some social virtual character websites such as Gaia Online and TinierMe…" [R147]).

Lest we got the impression that respondents ever logged off, a few said things like, "Everything: Bill paying, shopping, games, tv, movies" [R076] and "Browsing random webpages, watching user-created videos and looking at user-created media, talking to friends, playing games like WoW." [R090].

An open-ended question revealed what respondents published on the Internet. Many explained the specific types of visual media they created: "My art, I'm a photographer and I put my artwork online" [R060]; "…I publish animations and graphics I do on flickr and vimeo/youtube" [R074]; "Natural and man-made disaster photos" [R192]; "My portfolio of art and some works of others that I collect..." [R231]. Some respondents reported a direct connection between photo-sharing and their work as professional photographers, artists, and in a few cases, models.

In addition to this expected category, many participants reported sharing status updates and profile-related information; for them, sharing one's age, gender, likes/dislikes, relationship status, or mood falls under the rubric of publishing. For example, R075 said, "I publish my age, sex, religion, daily musings, my city, but that's as far as I go." R062 said he published "…Status Updates, Thoughts and Frustrations." This conflation of status-sharing with publishing was noted by R086: "I share vacation photos with my friends on the internet. I don't publish anything."

This view of publication led respondents to bring up privacy concerns similar to those reported in our Twitter survey, although the known discrepancy between privacy attitudes and actions (see [1]) were reflected in responses such as, "Some of the information that I put on the [Internet] is private. I tend to put more than is probably safe" [R018]. Nonetheless, a certain level of aspirational privacy-awareness was expressed in participants' responses. For example, R222 wrote "I might publish some of my non-significant day to day activities such as 'Outside all day, good thing it's only 103 degrees' and what not. I also publish some of my interests, such as favorite music, movies, activities, etc. I try to avoid publishing anything significant or important."

Over one-quarter of the participants said they blogged or created other textual content such as fiction, reviews, forum posts, or even books. For example, R095 said, "…I have some articles published on sites such as Helium and Associated Content. These articles [are] about various topics, including college and health" and R148 said he published a blog "about our process of building a house."

Participants reported sharing funny or interesting items (e.g. R144 said "I also share humorous e-mails that are sent to me"), an indication of reuse. They also reported sharing found photos: "[I publish] nice pictures i have found from around the net." [R061]

3. RESULTS

We looked to this survey to provide two different kinds of results. First, we are probing respondents' attitudes about the ownership of visual material. Ownership conflicts are common: who can legitimately post a picture on Flickr, the photographer who took the photo, or the photo's subject? Policies and laws are not always well-aligned with the attitudes of people who share visual media. Thus the results of the attitude portion of the survey are grounded in scenarios and the specific examples they provide. Second, we are investigating practice, and the discrepancies between attitudes and practice. We also base behavioral results in specific examples, so that we can understand a range of photo-sharing practices.

3.1 Attitudes

Respondents assessed 18 scenario-based statements about saving, sharing, publishing, and removing the photos shown in Figures 1 and 2 on a 7 point Likert scale (where 7 is *agree strongly* and 1 is *disagree strongly*). Table 5 summarizes the scenarios and statements, and reports some high-level results.

Table 5. Summary of scenario-based attitudes

Statement	Mean	Mode
Fred takes a photo of Janice and Jill (with Beverly, Vivienne, and Kim in the background). Later, he emails the photo to Janice and Jill, and uploads it to his Flickr account, tagging it Club Midnight, Janice, and Jill.		
Q3. Fred should have the right to save the photo to his hard drive.	6.43	7
Q4. Janice should have the right to save the photo Fred emailed her to her PC's hard drive.	6.48	7
Q5. Fred should have the right to post the photo to his Facebook wall.	5.79	6
Q6. Janice should have the right to post the photo to her Facebook wall.	6.03	6
Q7. Fred should have the right to publish the photo to his public Flickr account.	5.33	6
Q8. Janice should have the right to publish the photo to her public Flickr account.	5.59	6
Q9. Jill thinks the photo makes her look fat. Jill should have the right to remove the photo from Fred's public Flickr account.	4.20	6
Q10. Fred thinks the photo won't be good for his photography business. Fred should have the right to remove it from Janice's Flickr account, where she has given him photographic credit.	4.17	6
Q11. Janice should have the right to email the photo to her friends from high school.	5.95	6
Q12. Someone has posted a comment "Everyone was so drunk that night!" on the photo on Fred's Facebook wall. Janice should have the right to remove the comment.	4.92	7
Vivienne, who is in the background, has found Fred's photo (although she doesn't know who Fred is). She thinks it's a flattering photo of her, so she downloads it and crops out everyone else. She is left with a small photo of herself.		
Q14. Vivienne should have the right to save the cropped version of the photo to her hard drive.	6.14	7
Q15. Vivienne should have the right to use the cropped photo as her Match.com profile photo.	6.03	7
Q16. Vivienne should have the right to publish the cropped version of the photo in a public blog post that talks about her night out at the club.	5.74	6
Q17. Vivienne worries her ex-husband may use Fred's public photo of Kim at the club against her in a custody battle. Vivienne should have the right to remove the picture from Fred's Flickr account.	3.43	2
Club Midnight's management routinely searches the Web for photos taken at the club. They purchase the photos they like for $10 apiece to use to publicize the club online. They find copies of the photo on Janice's Flickr account, on Fred's Flickr account, and on Vivienne's blog. They purchase the photo.		
Q21. Beverly (the other woman in the background) should have the right to remove the photo from Club Midnight's online collection.	3.98	2,6
The Library of Congress is acquiring the entire public Flickr collection. This will allow the LoC to maintain the collection as a historical artifact 'forever', and grant access to it—including the ability to view and copy photos—as they see fit.		
Q22. The LoC can give researchers the ability to view and copy photos from the collection.	4.65	6
Q23. The LoC can give the public the ability to view and copy photos from the collection.	4.14	6
Q24. The LoC can give the public the ability to view and copy photos from the collection after 50 years have passed.	4.93	6

3.1.1 Attitudes about saving and storing photos

Respondents generally have a liberal attitude about who can save the photo. They believe that the photographer and the subjects have roughly the same right to save the photo on their local hard drives; however, they feel slightly less strongly about the bystander's right to save the photo (compared with the subject and the photographer). The difference is statistically significant ($p<.005$, Wilcoxon Signed Rank Test). A slightly lower score is consistent with the survey's qualitative results that knowing the

photographer or subject gives one greater ownership rights to the photo (discussed in Section 3.2.1), because the scenario specifies that the bystander does not know the photographer or the subject.

Figure 3 shows graphs of these relative curves.

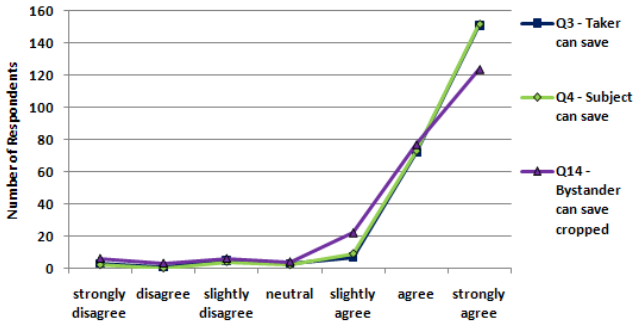

Figure 3. Responses to three statements about saving photos

3.1.2 Attitudes about sharing and publishing photos

This portion of the survey distinguishes between sharing, which implies that the person controlling the photo is disseminating it to a defined portion of his or her social network, and publishing, which implies the photo is being pushed into the public sphere. In the first two sharing cases, the photo is posted to Facebook; in the third, it is emailed to specific recipients; and in the fourth, a cropped portion of the photo is used as a Match.com dating profile, all conventional venues for sharing the photo. Publishing in all but one scenario involves posting to a public Flickr account; (the other scenario specifies a public blog post).

Figure 4 compares the seven cases of sharing and publishing.

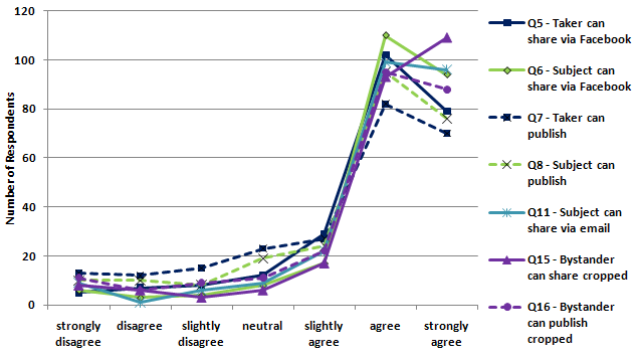

Figure 4. Responses to seven statements about sharing and publishing photos

Interestingly, they all follow similar trajectories, except the case in which Vivienne (the woman in the background) has cropped everyone else out of the photo. In this case, some respondents feel strongly that she can share the photo of herself (she is not violating anyone else's privacy), but possibly she has less right to publish it. Responses later in the survey reveal this is probably because she is neither the photo's subject, nor the photographer, nor does she know the subjects or the photographer, nor has she asked their permission to use the photo; this result is consistent with the idea that the photographer may retain commercial rights, even if person appearing in photo can share it.

Since the statements present roughly equivalent situations for the photographer and subject, it seems that respondents feel that appearing in the photo gives a person slightly more right to share or publish the photo than taking it does. Indeed, the photographer's right to publish was significantly lower than all other share/publish rights ($p<.02$ for most similar, Wilcoxon) and his rights to share the photo are significantly lower than the other sharing rights ($p<.05$ for most similar, Wilcoxon). This ordering of rights may depend on the photo's genre. In this case, privacy issues may outweigh photo's commercial potential.

3.1.3 Removing photos or photo annotations

In our Twitter survey, removing other peoples' tweets proved to be controversial, particularly if deletion removed more content than necessary [12]. The photo scenarios tested removal in a variety of situations (see Table 5, Q9, Q10, Q12, Q17, and Q21).

Figure 5 shows removal to be controversial. It is the least controversial (and the attitudes trend the most positive) if only a comment is affected ($p<.001$ for nearest, Wilcoxon). This result is consistent with the qualitative results; respondents thought they should be able to remove a tag that identifies who is in the photo. This result is also consistent with the privacy literature [2].

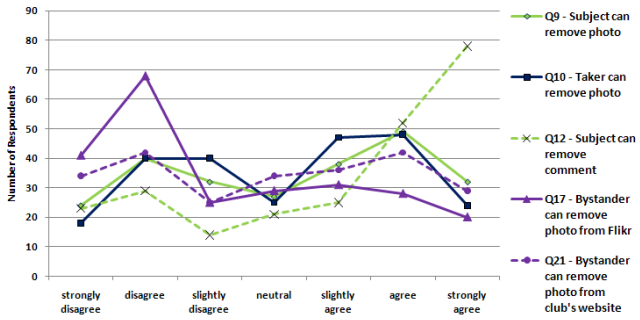

Figure 5. Responses to five statements about removing photos or comments

Three other photo-removal situations (the subject or photographer removed photos from one another's public Flickr account, or the bystander removed the photo from a commercial account) are weakly controversial; reactions are mixed and trend very mildly positive. The differences between these three situations were not statistically significant.

A bystander's ability to remove the photo from a non-commercial website is less controversial, but trends sharply negative (i.e. respondents feel she shouldn't be able to do this). Why would this response be out of step with the others? Reactions may be confounded by the sense that the photo is being removed to cover up something inappropriate or, at worst, illegal. In this case, the respondents' sympathy for the bystander's privacy interests are outweighed by what respondents may feel is the social good (note the peak at 'disagree'; it is the only dramatic peak given the roughly equivalent situations). Again, the responses in this situation are strongly statistically significant when compared to the other removal situations ($p<.001$, Wilcoxon).

3.1.4 Attitudes about institutional archiving

In our last survey, we posed three statements about a scenario in which the Library of Congress archives the public Twitter feed. In this survey, we posed three parallel statements about a scenario in which the Library of Congress archives the public Flickr photo database: (1) Everyone should have access to the Flickr archive after 50 years has passed; (2) Researchers should have access to the Flickr archive now; (3) Everyone should have access to the Flickr archive now. These are the only scenarios that are readily compared across the two surveys, since media type is the only difference. Who should have access to this archive? Does the passing of time influence the attitude toward access? The answer

varies in interesting and statistically significant ways (p<.02 for nearest, Wilcoxon). Figure 6 shows the results for photographs.

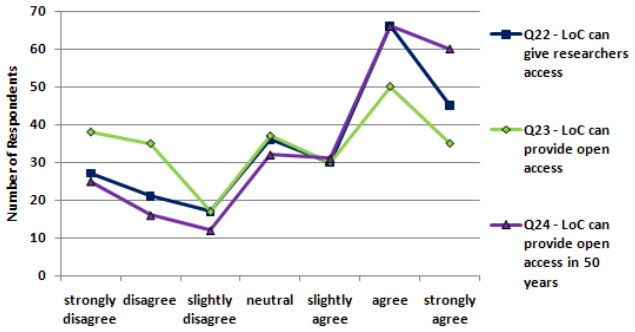

Figure 6. Comparing three ways the Library of Congress may provide access to archived Flickr content

Respondents are cautious about general public access to Flickr's photographic content. The strongest preference is to provide time-shifted access for everyone. Both researcher access and access by the general public tend to be more controversial, with the access by the general public trending slightly more negative than access that is restricted to researchers. Why do respondents prefer delaying access for 50 years? They may recognize the important role photos play in preserving cultural heritage, or they may perceive a diminished need for privacy over time.

Table 6. Comparing Flickr access with Twitter access

Brief statement	*Flickr (mean)*	*Twitter (mean)*
Access to everyone in 50 years	4.93	4.59
Access to researchers now	4.65	4.72
Access to everyone now	4.14	4.22

Table 6 compares the trends between Flickr results and Twitter results; these trends are not intended to supplant the curves, but rather to show the statements' order. In the Twitter case, restricted access was preferred over time-shifted access, and in the Flickr case, time-shifted access was preferred over restricted access. The curves for researcher access follow each other very closely; perhaps respondents envisioned similar use of the resource. Similarly, there was little difference in responses to providing immediate universal access. The difference in responses for public access delayed 50 years is significant (p<.02, Mann Whitney).

It is important to note that either limiting access or deferring it reduces the level of controversy introduced by these hypothetical institutional acquisitions. It seems inevitable that cultural heritage institutions will eventually assume a role in the stewardship of significant socially-curated digital resources.

3.2 Photo sharing and reuse practices

Photo-sharing encompasses a range of practices, from sending a friend a few cell phone photos to maintaining a professional Flickr site or posting dozens of Facebook albums. How many photos did respondents report sharing? We relied on order-of-magnitude estimates, because it is difficult for people to remember all the photos they have shared or all the sites they have used [11]. The majority of respondents report sharing hundreds of photos (as opposed to tens or thousands), which means they have substantial investment in photo-sharing. Most (64%) used Facebook the last time they shared photos.

Most respondents (64%) use three or more ways (e.g. Facebook, email, and Flickr) to share photos, depending on their overall aim. Generally, Facebook is the most popular way to share photos (88%), followed by email (72%). Respondents share photos via Facebook because it allows them to distribute the photos easily ("All my friends are on Facebook") and it sets appropriate expectations about the photos' genre; Facebook also gives them the means to manage photos, and solicit comments and labels.

Respondents tend to use email when they want to share in a more targeted and private way; it provides a greater sense of control (e.g. the photo will not be findable on the Internet, and its resolution will not change). Email is also regarded as the most universal: respondents felt that everyone uses email.

3.2.1 Reuse in practice

Respondents were asked if they reused online photos, and if so, how often. We left the definition of reuse broad, because once a photo is downloaded, it may creep into a user's general resources, and may be reused many times, its source forgotten. Almost 3/4 of the respondents reported reusing photos at least 'sometimes'; more than 1/4 reused online photos frequently. Because these are self-reported estimates, and there was some uncertainty about the legal status of reuse, the estimates are probably conservative. Figure 7 shows reuse frequency.

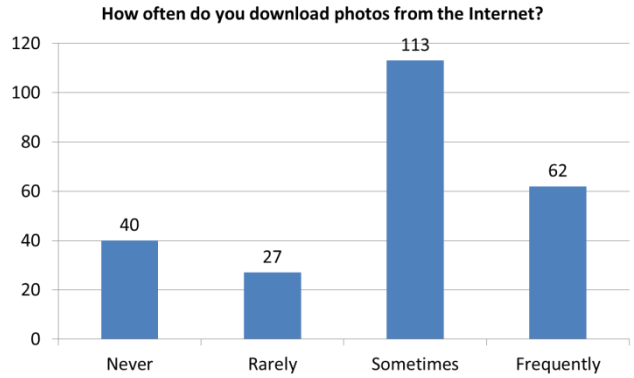

Figure 7. Respondents' self-reports of visual media reuse

We then asked respondents to describe the last time they remember downloading an online photo to use for their own purposes. Respondents not only described the photo, but also volunteered why it was okay for them to do so.

The most common reason for downloading a photo was that it was funny; at least 37 respondents explained their most recent instance of photo reuse this way. For example, R053 wrote, "I found a funny pic of a kid on ladies [sic] back while she was sunbathing and it created the optical illusion of the child was sitting up and the giant legs were his. It was funny and I had to share."

Almost as many respondents (34) explained that they had a personal connection with the photo or photographer, e.g. that they knew the subject, that they were the subject, or that they had attended the event in question. For example, R058 said, "I have a couple friends/family members on Facebook and if they have cute pics of my kids or grandkids I copy them to my home computer for use as wallpaper, or to print out for display in my home."

The third most common explanation for downloading an online photo was need (31 instances): the respondent claimed to need the photo as an illustration for a blog, presentation, or newsletter. For example, R124 said "The last time I remember [reusing a photo] was when I showed a picture of a cupcake a woman named Amanda baked. I also baked the same cupcake and included my picture as well. This was for my blog about cupcake recipes. I gave the person I got the picture from credit on my blog and linked to the original of her cupcake picture."

Nineteen responses fell under the rubric of images that portrayed public places, celebrities, or products. Respondents considered these photos to be public by virtue of their subject. For example, R159 said, "I couldn't find a photo I'd taken on a trip, which I wanted to use in a Facebook album, so I found a photo of the same landmark on someone's blog and republished it in my album." It is almost as if R159 is establishing the equivalence of these photos. However, in the more general case, these photos are used like clippings from a publication.

Nineteen respondents justified their last instance of reuse by discussing how lightweight (and therefore harmless) it was; e.g., the photo was used as a desktop image or wallpaper. R080 said, "A woman i went camping with took some group pics of me and my friends and she put them on Facebook. I downloaded the picture to use for my background on my desktop." In many cases, the reuse was not public (e.g. it was used for reference or as an inspiration): "I was looking for examples of a tattoo that I would like. I had to save it so I could email it to the tattoo artist." [R184] There were sixteen additional responses that fell under this rubric.

Other common explanations offered by respondents included knowing or having secured permission from the photographer (11 instances); using the photo for educational purposes (9 instances); changing the photo significantly for reuse (7 instances); not reusing now, but simply storing it for later (7 instances, which reflect respondents' attitudes about saving other peoples' photos). Just seven respondents claimed the photo they found online was explicitly open source or copyright-free. A few reused photos had been taken from advertising.

3.2.2 Reactions to the idea of photo reuse

After they had described their last photo reuse, respondents were asked more generally when reuse can be sanctioned, and when it cannot. Specifically, we asked, "What do you think about the reuse of photographs posted on the Web? When is it okay? When is it a bad idea?" Some participants approached the question as a general referendum on reuse; others worked from cases they thought were (or were not) permissible.

Legal scholar Lessig and others have pointed to a general relaxation of standards regarding reuse, asserting that the born-digital generation is heading squarely toward a remix culture [10],[6]. Others who have begun to investigate this question have found that artistic communities (e.g. the well-established site DeviantArt) have a developed sense of ownership and attribution that may be realized in conventions and practices [13]; reuse is not something that is taken lightly, and there are non-negotiable boundaries between acceptable reuse, and plagiarism and theft.

Our survey begins to tease out practical restrictions on reuse and explore which reuse is permissible given everyday situations and commonly understood strictures. We entered this territory with caution: peoples' attitudes may differ from their behaviors, as we have seen with questions of privacy [1]. Furthermore, privacy issues associated with personal photos are highly nuanced, and subject to different contextual factors [3]. Yet we felt people would draw on their existing experiences with reuse and how they saw others reuse media online, and would be able to articulate factors or theories that influence their reuse decisions.

Respondents justified and explained reuse along four basic dimensions: the characteristics of the material, the reuser's intent, the legal and social structures that guide and constrain reuse, and the systems used to render and store the material; some responses fell into more than one category. Each dimension can be further described as follows:

(1) The ability to reuse a photo depends on the content itself, its source, or the creator's intent and is independent of what you plan to do with it; reuse resides squarely in the material itself and the original context in which it was created and used.

(2) The ability to reuse a photo depends on your intent (as a reuser) and whether you've taken the correct steps to be able to reuse the material.

(3) The ability to reuse a photo depends on social and legal structures that have been laid out to guide fair use and protect privacy.

(4) The ability to reuse a photo depends on what the technology permits, i.e. restrictions and affordances implemented by the software. If you can reuse it (e.g. the 'copy' or 'save as' functions have not been disabled), or if the application encourages reuse (e.g. by offering a "share on Facebook" button), then it is permissible to reuse it.

Respondents also differed on whether this is even an answerable question. Can you ever be certain whether it is legal and ethical to reuse online material? Some respondents felt that there is an absolute answer. Others are reuse agnostics, convinced there is no right answer, regardless of how much is known about the media or situation; as R010 asserts, "It's difficult and complicated."

Figure 8 summarizes respondents' reuse theories and their origins. The two quadrants above the line refer to creation-related factors; the two quadrants below refer to reuse-related factors.

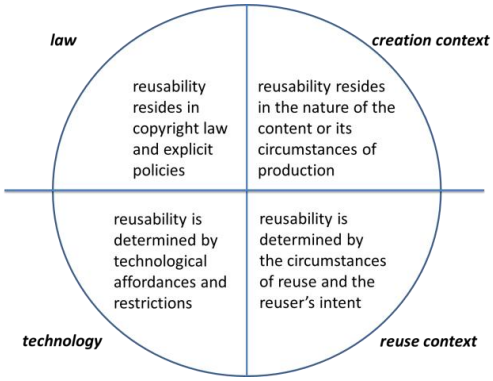

Figure 8. Four categories of respondents' reuse theories

We examine each of these four quadrants in turn.

Reuse constraints depend on the material or its source. Many respondents look to the material itself to determine whether it can be reused; their theories do not depend on how they plan to use it, its proposed legal status, or whether the software permits them to do it. There are two aspects of the material that guide reuse: the content and its original use.

Thus explanations rely on the photo's subject. Are there children in the photo? Is it a landscape or a celebrity? Is it a photo of the respondent or the respondent's friends or family? On the flip side, does it appear to be personal, and the subject is someone you don't know? Some reusability theories rely on judgments of the photo as a moral object: is the subject matter violent or offensive? Is the act it portrays illegal? If so, it is a poor candidate for reuse.

R227 offered a content-determined reuse example:

> *"Personal photos from someone's personal album should probably not be reused. Perhaps if it is picture someone takes of a flower, or a sunset, and you find it pretty and want to save it, then that's fine..." [R227]*

The context in which the material is found frequently reveals the photographer's intent or the photo's status. Respondents may infer artistic purposes—many respondents said they would not reuse a photo if they encountered it in a venue that made the respondent think that the photographer was a professional, and it was a commercial work, or that it represented an artistic effort.

> *"Personally I usually think that if it is not a [sic] artistic photograph it doesn't really matter--that if you put it online it's free to be used and abused by anyone, no matter how much you may like it. But when the photo is a protected artistic photograph of a photographer, then issues become more confusing..." [R090]*

The history and provenance of the material also matters. If you've seen the video of the guy running into the glass door a thousand times before, the photographer's or subject's ownership rights seem to be reduced. Thus, if the material has "been circulating for a while" [R227], then it is more likely to be fair game for reuse.

As a logical extension of this informal provenance principle, the photographer may even put an explicit notice on the photo (other than a copyright mark or Creative Commons designation) to clarify this intent. In this case, respondents seem to expect the owner to police reuse, and to request a reuser to stop, e.g.:

> *"…if the person specifically requests not to distribute the picture or try to make money from it, the request should be honored. If you had already been distributing the picture and the person asks you to stop, that request should also be honored." [R227]*

Reuse constraints depend on reuse circumstances. In this case, respondents' hypothetical constraints are based on how the material is to be reused. What is the reuser planning to do with the material? Will it be used in a manner other than it was originally intended, e.g. to ridicule the photo's subject or the photographer? Will reuse defraud (or fool) the viewer? Is the circulation limited (e.g., will it be posted on Facebook or on a public site)? Is it being moved from a private to a public space?

Many respondents seem to have a specific example in mind when they formulate this type of restriction. It is the flip side of 'I sent it to my friends because it was funny.' If funny crosses the line into mean or insulting (the website PeopleOfWalmart seems to come up on both sides of the argument), then it enters a taboo reuse territory for some respondents; we discuss this breakdown of reciprocity in a later section.

Here we can divide reuse into actual circumstances (will the photo be placed on a website, into email, or on Facebook), the poster's intent (will the photo become a profile picture? Will it be used to ridicule the subject or to illustrate a blog post?), and the poster's overarching purpose (commercial? personal?). Again there are intimations that it is permissible to reuse a photo if the reuse is lightweight, or if the photo plays a minor illustrative role when it is republished; unsurprisingly, the actual use is far more prominent in the rationale of the respondent's own last instance of reuse than it is in these general discussions. However, examples reveal that intent figures into the personal calculus of reuse:

> *"…If the user will be profiting from your photo or using it for personal use. If it's for personal use then it would be okay. If it's on a website that makes money but it's not money coming from your photo but your photo makes the website look better then I think that would be okay also." [R207]*

> *"It's a bad idea if the photograph is intentionally being used in a dishonest, fraudulent, or underhanded way." [R006]*

> *"its ok to me as long as theyre not insulting anyone." [R218]*

Just as a photo's content, provenance, and history are mediated by specific instructions attached to the material by its creator, so too may the reuser's intent be mediated by taking the appropriate steps (such as asking permission or crediting the photographer or both). In this example, the respondent carefully delineates the ideal steps that would be taken to soften the blow of reuse:

> *"… It's a type of unwritten etiquette: get permission if possible, always give credit to photographer, and if you couldn't get permission because you don't know the photographer then you should include a credit/byline stating that you don't know the photographer, but that if they contact you you will of course credit/remove as per their wishes." [R198]*

Reuse depends on legal notions of privacy or copyright. As we saw in earlier discussions of what respondents shared online, abstract discussions of reuse may bring in notions of privacy. As we would expect from the privacy literature, these discussions are far more perspicuous in abstract formulations of reuse guidelines than they are in explanations of real reuse. Legal language may even be used (e.g., 'a diminished expectation of privacy'). In our respondents' views, privacy rights may be violated if someone's identity is revealed, or if a minor appears in the photo. Privacy rights may be diminished if the subject is a public figure, is in a public place, or if the photos are from a public Web site.

Examples of respondents' privacy formulations are:

> *"…If the subject is a public, well known person place or thing, I believe it is within my rights to use the image in a limited sense (as my background, profile picture on a social media site, message board, etc). However, if the image is blatantly using a private, non-public figure, place or thing, I am less inclined to use or reproduce it." [R185]*

> *"…as soon as you post a photo on a photo sharing site they can be accessed by anyone that has the right to be on your site and therefor[sic] it becomes your responsibility to protect photos you do not want disseminated. It would be the same as throwing your photos in the trash. Once they are on the curb, anyone can view them." [R221]*

Respondents' understandings of copyright (or 'copywrite' in three instances in the responses) occasionally entered the discussion, revealing a weak grasp of the actual US law. They expressed three misconceptions: (1) Online photos are automatically put in the public domain; (2) The Internet is unregulated, so you can reuse whatever you find; and (3) If visual media is not labeled as copyrighted, it can be reused.

The following are examples of respondent discussions of copyright law, public domain, and fair use:

> *"the web is public domain. if you post a picture (with or without a copyright watermark), it's going to be seen and recycled by others. if you don't want your picture or face to possibly end up being seen by future bosses, kids, friends, parents whatever, then don't post it." [R153]*

> *"It is OK if it is not copyrighted or it is on a site where it is indicated that it is free use. Otherwise it is not right to take it. Especially for publications or other sites." [R079]*

Creative Commons entered some respondent discussions; a few understood it as a codified simplification of copyright that allowed content creators to place appropriate restrictions and permissions on their material. R238 offered a lengthy response, in which she made an effort to balance the practical effect of Web publishing with the mediating effect of codified strictures:

"I think that if someone, by your definition, PUBLISHES something online, it's basically fair game for the world, whether or not that's the intention. Of course, you can do things like put Creative Commons licenses on the images you publish, and I believe those licenses should be respected, but due to the nature of technology and the internet, it's impossible to ever post anything online without some chance of having someone or something save it somewhere..."

But participants also offered ambiguous explanations of Creative Commons' protections. For example, R046 said, "If the image is in the public domain or under a creative commons, [reuse] should be fine so long as copyright is not infringed. Obey the laws."

Reuse depends on technological affordances or restrictions. Technological enforcement of copy protection has long been the holy grail of publishers and some photographers and artists. Some respondents, baffled by the complexities of reuse, folded this type of technology into their discussions, asserting that as long as the technology prevented a user from downloading the content, then it was not available for reuse. Otherwise, visual media could be reused freely. Although some of these responses were abstract (e.g. "its okay to use/reuse photographs on the web as long as it is permitted by the original uploader. most sites contain that feature where pictures can be set as viewable in private or public so there's nothing to worry about." [R115]), it is likely the respondents were thinking of use restrictions such as 'save as' or 'copy' functions that were disabled by the browser.

Occasionally, respondents voiced this type of technological enforcement in positive terms, i.e. that they rely on the reuse affordances provided by the user interface (for example, the button to share content on Facebook or to tweet it on Twitter): "I only post photos that feature the 'share' button for Facebook built in to the blog." [R140]

Complete reliance on technology is uncommon and unrealistic (partly because it is difficult to prevent the rendered image from being recorded or screen-scraped). Few respondents came up with a software-enforced theory of reuse, and even fewer cited it to explain the last thing they shared (that is, even if they used these mechanisms, they by no means attributed them with any power to control or justify specific instances of reuse).

Absolutes v. no easy answers. When probed about reuse in general, some respondents took polar opposite positions: they either explained that it is never okay to reuse online material, or that the Internet is a Wild West, and anything goes. In fact, a surprising number took the "anything goes" stance. The following are examples of both ends of the absolutist position:

"It is never okay, that is a type of plaugarism [sic]." [R024]

"I think it is probably always a bad idea, and you never know when something may come back to bite you in the butt… That being said, it's easy to forget that because you think you are just sharing some harmless photos with your friends." [R196]

"I think in this age, it is fine, I have not personally had a bad experience." [R174]

"Its the wild west out there on the web, everyone does whatever." [R121]

Some respondents simply threw up their hands and said that reuse relies on so many factors that it is unknowable. These respondents may believe that they will figure out what to do when the situation arises, or they may be genuinely baffled, e.g.:

"I honestly don't know or understand the boundaries. It's difficult and complicated."[R010]

"It's really hard to say. I think parents need to protect their children somehow. We can't plagarize [sic] text from websites or articles, so why can we plagarize [sic] photos? It's a tough call." [R100]

Of course, respondents may be reacting to the constraints of the survey, saying in effect that they don't feel like coming up with an answer to this question, given a web box and a small remuneration for their efforts. However, others did come up with answers, so this type of non-answer may reflect honest bewilderment.

Differences between reuse theory and practice. Earlier we reported on respondents' answers when they were asked about the last time they downloaded an online photo, and what they did with it. A subsequent question explored their general reactions to reuse. Thus we know what they did in a concrete, memorable instance of reuse, and we know their theoretical stance. Unsurprisingly, even though the two questions were consecutive, there was a gulf between the responses. The two answers were not necessarily inconsistent; rather, the first answer emphasized the respondent's personal judgment and ability to tell good reuse from bad reuse, and the second answer revealed respondents' willingness (or unwillingness) to trust the reciprocal judgment of their peers.

In this section, we discuss the distinction between what people do in practice—their reported behavior—and their beliefs about what is permissible in the general case. Several elements of real reuse are missing from the theoretical discussions of reuse: need-and use-based justifications, and justifications that rely on the nature of the photo's source (e.g. where it came from, and whether it has circulated). These we will not discuss at length. It seems that for real reuse, practical exigencies and concerns outweigh any theoretical prohibitions if there is no apparent harm done.

More interesting are subtle contradictions in which respondents appeal to their own judgment to explain reuse, and in so doing, reveal failures of reciprocity (i.e. they defy common principles other respondents apply in theory, thereby highlighting why reuse is complex and nuanced); this type of failure was originally noted in the CSCW literature, e.g. users wanted to see without being seen [5]. Three types of photos are rife with such contradictions: (1) funny photos; (2) altered photos; (3) photos of children.

Many respondents were horrified by the abstract idea of making fun of people (e.g. "if someone is in the background of the photo and is tripping over a friend's leg or something on the ground and fall flat on their face, I don't think it's ethical or right to be able to post it." [R182]) or posting damaging material (e.g. "It's a bad idea to share it if it's showing the people in the picture in a bad light (i.e. drunk at the beach, half naked, partying too hard) because it could potentially ruin their careers if they're underage." [R136]). However, respondents frequently explained their own photo reuse by saying that a picture was funny (e.g. "i sent out an email of ugly prom pics" [R235]). This contradiction shows a clear instance of weakened reciprocity (in other words, 'people shouldn't send out material that is mean or offensive, but I can rely on my own sensibilities to identify exceptions').

This type of contradiction may also be mediated by the way the photo is reused. For example, R187 told a story: "I've saved pictures from Facebook of a high school classmate, and now a City Council man dressed as a pimp from Facebook. These just amuse me and don't seem like the best idea to post publicly."

In reporting real reuse instances, respondents discuss minor alterations, e.g., "…I downloaded a random photo that I thought was amusing and photoshopped it to make it relate to a friend of mine, and then e-mailed him the photoshopped photo" [R216]. By

contrast, in his abstract discussion of reuse, R223 said that he didn't think reuse was permissible if "[p]eople or companies could use people's [sic] photos to maliciously photo shop someone's picture to embarrass someone."

Finally, respondents express horror about the reuse of photos of children in the abstract: "I think [reuse] endangers kids…, makes kidnapping and abuse more accessible, makes life of perverts better. I don't like that anyone can look at photos of my nieces on Flickr or Fbook. I think kids' images should be especially regulated" [R082]. By contrast, R011 unselfconsciously recounted a use instance, "I downloaded a pic of a cute baby i saw online to use as my desktop background." All three inconsistencies underscore one of the most interesting features of reuse: when confronted with a desire to reuse a photo, respondents trust their own judgment—the circumstances justify reuse—and mistrust the reciprocal judgment of their peers.

Similarities between theory and practice. Which concepts appear in both theory and practice? These concepts are likely to be workable bases for policies, and may reflect aspects of fair use that have been more broadly assimilated. Respondents cite five concepts in both concrete and abstract explanations: (1) permission; (2) public v. personal images; (3) commercial v. non-commercial use; (4) the user's social distance from the photographer or subject matter; and (5) explicit copyright notices or watermarks.

These five concepts are likely to be important because they seem to have an intuitive appeal and can be applied to real situations.

4. CONCLUSIONS AND FUTURE WORK

The ownership and reuse of visual media covers complex practical and ethical terrain. The actions and attitudes of participants in our study have been shaped by pragmatic concerns and experiences, as well as varied understandings of legal policies and larger social conventions. Participants bring different aspects of a use situation to the fore when they decide whether they can reuse a photo, including:

- the photographer's intent and the context in which the picture was published (e.g., the photo's genre);
- the technological affordances that either promote sharing or restrict it (e.g. the presence of a "share" button);
- their understanding of copyright protection and social conventions (e.g., attribution and permission-seeking); and
- their own intent and the specific circumstances of reuse (e.g. reuse as a desktop background v. republication in a blog).

Taken together with our previous study of Twitter, we have found storing and saving material to be relatively unproblematic. By contrast, removal is controversial, and is where the rubber is likely to meet the road in personal archiving settings. That is, people feel they can save almost anything they want, but they are not certain whether they can remove a photo (or a tweet) from someone else's store, even if they have good reason to do. Attitudes about the reuse of visual media are by and large sensible, if not reciprocal: republication is regarded more conservatively than sharing among a circumscribed set of friends, and participants rely on their own good sense about what they can and cannot do, *but they do not apply the same standards to the actions of others*.

This lack of reciprocity (and apparent inconsistency) is evident in the responses to open-ended questions in our survey. Respondents trust their own instincts to decide whether their own needs should outweigh copyright restrictions. Yet when they discuss the application of standards to others, they tend to rely on worst-case situations, and view concepts like copyright and privacy in a more restrictive way. In other words, they trust themselves to download a cute photo of a baby, but others should be prevented from doing so lest they be potential pornographers or miscreants.

Participants find immediate public access to institutional archives of visual media (as hypothetically provided by the Library of Congress) to be controversial. They favor a scenario in which open access is deferred for 50 years; access that is limited to researchers is also preferred over immediate public access.

The two studies we have performed thus far point to a series of issues that we are planning to resolve in the next studies in our series; these issues include what constitutes context in social media and the limits of fair use. Using methods similar to those we describe in this study, we will investigate open questions using media types and genres such as reviews, massively multiplayer role playing games, and social networks.

5. REFERENCES

[1] Acquisti, A. and Grossklags, J. Privacy Attitudes and Privacy Behavior, in J. Camp and S. Lewis (Eds.) *The Economics of Information Security*, Kluwer, Boston, pp. 165-178.

[2] Besmer, A. and Lipford, H.R. Moving Beyond Untagging: Photo Privacy in a Tagged World. *Proc. CHI'10*, 1563-1572.

[3] Cunningham, S. Privacy and Trust Issues for Online Personal Photograph Collections. *JTAER 5*, 2, 2010, 26-40.

[4] Downs, J., Holbrook, M., Sheng, S., & Cranor, L. Are your participants gaming the system?: Screening Mechanical Turk workers. *Proc. CHI'10*. 2399-2402.

[5] Dourish, P. and Bly, S. Portholes: supporting awareness in a distributed work group. *Proc. CHI '92*. 541-547.

[6] Hill, B., Monroy-Hernandez, A., Olson, K. Responses to Remixing on a Social Media Website. *Proc. AAAI Conference on Weblogs and Social Media*. 2010. 74-81.

[7] Ipeirotis, P. Demographics of Mechanical Turk. http://hdl.handle.net/2451/29585, 10 March 2010.

[8] Jakobsson, M. (2009) Experimenting on Mechanical Turk: 5 How Tos. *ITWorld*, September 3, 2009.

[9] Kittur, A., Chi, E., Suh, B. Crowdsourcing User Studies with Mechanical Turk. *Proc. CHI'08*. 453-456.

[10] Lessig, L. *Remix: Making Art and Commerce Thrive in the Hybrid Economy*, Penguin, New York, 2008.

[11] Marshall, C.C. Rethinking Personal Digital Archiving, Part 1: Four Challenges from the Field. *DLib*, 14, 3/4

[12] Marshall, C.C., Shipman, F.M. "Social Media Ownership: Using Twitter as a Window onto Current Attitudes and Beliefs. To appear *Proc. CHI'11*, Vancouver, BC, May 7-12.

[13] Perkel, D. The Art of Theft: Creativity and Property on deviantART. *Material World Blog*. 2010. Retrieved from http://blogs.nyu.edu/projects/materialworld/2010/07/the_art_of_theft_creativity_an.html.

[14] Wray, R. Goodbye petabytes, hello zettabytes. *UK Guardian*, 3 May 2010.