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Print versus Screen—Presentation Medium-Dependent Picture Consumption - Part A

This month's research summary is the second half of Print versus Screen—Presentation Medium-Dependent Picture Consumption, by Franziska Frey, Ph.D., Mariela Rodriguez Adames, Ya-fang Tsai, Frank Cost and Susan Farnand. This month, we will conclude with a summary of the research objective, methodology, and research results. ***To see the figures and tables referenced in this summary, please refer to*** *the full monograph.*

Research Objective
Companies who want to make money selling either printed or digital photo products to consumer photographers need to understand these consumers' printing behavior, presentation medium-dependent differences of picture consumption, and content management behavior.

The objective of this study was to obtain an overall picture of the state-of-the-art consumer photographer's practices, particularly of the taking, sharing, and saving of pictures by college-aged young adults. Specific research objectives and questions were:

- What are these young adults' printing behavior regarding their own images?
- What are the printing and media viewing preferences of college-aged young adults?
- What are their practices in terms of content management uses?

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Methodology

A presentation was designed with 32 photographs (student pictures and reference pictures) in landscape and portrait formats. The amount of content in the presentation was adjusted to be viewable in less than 15 minutes. The prints were 4-inch by 6-inch, in both landscape and portrait formats. A 1024 by 768 pixel resolution 13-inch MacBook displayed the presentation digitally. The sizes of the pages displayed on the monitor were the same as the size of the printed pictures. The viewer was able to view the electronic version of the presentation page by page by using the "page up" and "page down" keys on the computer.

Choice of Subjects

All subjects participating in the experiment viewed both the printed pictures and the same images on the monitor. Subjects were drawn from two Digital Asset Management classes of undergraduate students in the College of Imaging Arts & Sciences (CIAS) at Rochester Institute of Technology (RIT).

The First Experiement

The experiment was conducted over a period of two weeks. Participants signed up for an hour-long session during the two-week period to participate in the experiment. Participants were advised not to talk about the experiment with their colleagues after taking the survey.

Participants were instructed to take as much time as they needed to review the content. A timer was started when the participant began, and the interviewer pressed the stop button on the timer when the participant finished. The times and observations were recorded, with participants identified by code only so that responses were not associated with specific individuals.

In a second part of the same experiment, participants reviewed a set of reference images: images they did not take, some new, and some shown earlier in the testing. They then identified the pictures as "previously seen on-screen" or "printed." If they did not recall the picture, they were asked to state that as well.

The Second Experiment

A second experiment, based on the results of the first experiment described earlier, was developed and conducted, following the methodology described above. The topic of the questions

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About the Center

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accompanying this second experiment (listed in Table 1-2) focused on the content management behavior of the participants.

Research Results

Results of the First Experiment

A summary of results from the first experiment, along with responses to the survey questions from 39 respondents, are detailed below. First, participant demographics are explored. Responses to questions related to image viewing, selection, and identification are discussed relative to the demographic findings where possible. (See full monograph for figures and tables included in this summary)

All participants (with the exception of the first five participants) were first shown digital images, then printed images. The experimentation combined both digital and printed images to clarify the suggestion that participants tend to spend more time while in the first mode in which they observe the images.

Viewing Preferences

Out of the pool of participants, 59 percent stated that they preferred to look at printed images, 38 percent preferred images on-screen, and 3 percent equally preferred both media. (See Figure 1-5.) Statistical study results suggest that the mean preference for print or screen does not differ depending on gender, so it is likely that both genders have similar preferences. (See Appendix A.)

Survey participants were asked to discuss why they preferred one presentation medium over the other, their likes and dislikes regarding their choice, and the issues and challenges with the alternative option. Responses are summarized below, with actual responses shown in Table B-1 (see Appendix B).

Almost 18 percent of the participants said that they preferred printed images because they could see more details in the images. Thirty percent preferred prints because they were easier to look through; they valued the opportunity to flip through them, to move them around, etc. Furthermore, the majority of participants (36%) liked the prints better due to their quality and their bright, shiny, and saturated colors.

Figure 1-6 shows the results when participants were asked whether they ever printed their images, regardless of their preference. Female participants ages 19 to 21 and 22 to 24 said

that they never print in 70 percent and 67 percent of the cases, respectively. Forty-four percent of male participants in the 19 to 21 age range and 67 percent in the 22 to 24 age range also did not print.

The results show that 56 percent of the participants who print their pictures did spend more time looking at the printed images. On the other hand, 44 percent of the participants spent more time on the screen, even though they often print their images. Furthermore, the results show that 57 percent of the participants who never print their images spent more time looking at the pictures on-screen.

Table B-2 (see Appendix B) presents the reasons why participants may or may not prefer prints and why they do or do not print, along with their comments. Forty-one percent said that they do print their images. Among the top reasons for printing were to hang them up, to place them in a scrapbook, and to give them as presents. Fifty-nine percent of the participants said that they did not print, explaining as their main reason their lack of money to do so. Other reasons for not printing are mass media consumption (such as Internet media, blogs, message boards, podcasts, and video sharing) on computers, and having not much time to do so.

Figure 1-7 shows the percentage of participants who print by age range. Figure 1-8 shows the relationship between participants who print and whether their parents print. Forty-six percent of the participants in the 19 to 21 age range who print their images have 100 percent of their parents who also print. Participants in the 22 to 24 age range always print when their parents print, and when the participants do not print (67% of the cases), their parents print in 50 percent of the cases. For participants between 25 and 27 years old, their parents print 100 percent of the time, whether the participant prints (50%) or not (50%). For the last age range— 28 to 30—even though the entire population does not print, 50 percent of the parents print.

Results of Second Experiment
Summaries of results from the second experiment, along with responses to survey questions from 32 respondents, are detailed below. Responses to questions related to image viewing, selection, and identification are discussed relative to the demographic findings where possible.

Half of the participants were first shown digital images, then

printed images; the other half were first shown printed images, then digital images. For this second experiment, 5-inch by 7-inch images were used. This experiment was conducted to clarify the suggestion from the first experimentation that participants tend to spend more time with the first mode in which they observe the images.

Medium Preference: Print versus Screen
The participants were asked to carefully review the images. The times spent reviewing the images in both media were recorded, then analyzed. (See Table 1-5.) In general, when looking at the printed images, males spent approximately 13 percent more time than did females; when looking at the images on-screen, males spent approximately 11 percent more time than did females. For all participants, the total time spent looking at printed images was 39 percent higher than the time spent looking at the images on-screen.

Tables 1-6 and 1-7 show participants' choices of print or screen as the preferred medium for viewing their images in conjunction with whether they spent more or less time looking at their medium of preference. In general, participants did not spend more time looking at what they stated as their preferred presentation medium.

As illustrated in Tables 1-6 and 1-7, most of the participants spent more time looking at the images on-screen, regardless of the fact that 56 percent of them said that they preferred printed images.

Survey participants were asked to discuss why they preferred one medium over the other, their likes and dislikes regarding their choice, and the issues and challenges of the alternative option.

Twenty-two percent of the participants that preferred images on-screen said they could appreciate more details. Forty-one percent liked images on-screen better due to their quality and bright, shiny, and saturated colors. These results might be correlated to the fact that, for this experiment, larger images (5-inch by 7-inch) were used, as opposed to the 4-inch by 6-inch images used in the first experiment.
On the other hand, the majority of participants (55%) who liked the prints better stated as the main reasons the opportunity to flip through them, to be able to zoom in and out, and to move them around.

When participants were asked whether they ever printed their images, regardless of their medium preference, female participants said that they never print in 75 percent of the cases. Sixty-two percent of male participants also did not print. Sixty-two percent of the participants who print their pictures did spend more time looking at the printed images, while 39 percent of the participants spent more time viewing the images on-screen, even though they often print their pictures. Finally, 61 percent of the participants who never print their images spent more time looking at the pictures on-screen.

Overall, 25 percent said that they do print their images. Among the top reasons for printing were to hang up the images, to place them in a scrapbook, and to give them as presents. These results are very consistent with those of the first experiment. Seventy-five percent of the participants said they did not print, explaining that the main reason is a lack of money to do so. Other reasons for not printing are mass media consumption (such as Internet media, blogs, message boards, podcasts, and video sharing) on computers, and having not much time to print.

Conclusions

This research showed that males spent more time looking at the printed images than females, while both genders spent essentially the same amount of time looking at the images on-screen. In addition, the results of the experiments showed that most of the participants preferred printed images, while only one-third of the participants preferred images on-screen. In the group of participants who did print, male participants generally had a preference to print themselves, while females preferred to use print shops and online services. Among the most used printing tools were Kodak EasyShare Gallery, Shutterfly, and Flickr. In addition, Photoshop, Lightroom, and Picasa were used as editing tools, with Facebook mentioned as the main sharing tool. Ultimately, almost all of the participants wanted their printed pictures back, with the main reason given as the importance of the images in print, even though many of them did not print their photographs previously for a variety of reasons. The main reasons given for not printing their images were a lack of time and money.

What implications do these findings have? While participants might not print their images at this point in their life, they might revisit their pictures in the future and decide to share and print them then. The results of both experiments showed that

participants' parents prefer to print their images almost 100 percent of the time. Could this be a key for the photographic industry to get the message to college-aged young adults that print is another medium to share images?

In terms of image preservation, the outcome of this work illustrated how participants usually keep their pictures on their computer hard drives in folders organized by date, event, or both. Another common practice is to utilize online storage as an off-site backup system, with Flickr being the most common. Moreover, it was found that the participants make use of free images organizers like Xnview or Irfanview, although the most common ones cited were iPhoto from Apple and Picasa from Google. None of the participants had ever used metadata for their images.

In addition, the results of the research showed that a handful of tools to add metadata to photographs are usable as-is, but many of these tools need more work to become applicable in a variety of environments. Significant development from the industry is required to create a robust and well-defined set of metadata remediation services that would be attractive to users.

Participants explained that organizing their photos is a complex problem. Generally, the software that comes bundled with digital cameras provides some basic photo management functionality. Companies like Adobe and ACDSee offer robust applications that enable editing, managing, and annotating the images in digital photo albums. Flickr provides the same sort of functionality on the Web, simplifying the process of publishing photos for public consumption. On the other hand, relatively few tools are available that can work directly on the metadata records of consumer photographers. The geographic location where an image was taken is one of the key pieces of information that consumers want to capture. Until recently, location capture was often accomplished with post-creation keyword annotation. With the advent of embedded GPS, accurate location information can now be automatically inserted
into image files at creation time and merged with applications like Google Maps. Exif, IPTC-IIM, IPTC Core, IPTC Extensions, and XMP all specify metadata properties that capture, with varying degrees of accuracy, either the location of the camera or the location of the image subject.

Keywords are used across software applications today. However, keywords (also called "tags") are often not used correctly, if they

are used at all. Applications overload the tags with general-purpose information exchange, such as for workflow or task management

While all of these solutions work for today and tomorrow, they ignore a bigger, longer- term issue: How are these photos going to be shared and stored in 50 years? One thing that consumer electronics has taught us in the last twenty years is that formats change, and they change quickly. However, for digital photographs, the problem is two-fold. Not only is there the need to worry about the storage medium (whether that means hard drives, a library of CDs, or on-line), there is also the need to worry about the file formats. Most photos are stored as JPEG files. JPEG compression has been around for a while, and history teaches us that there will eventually be a new format that will replace JPEG.

So, what is a college-aged photographer to do? One answer might be to go with the most reliable, future-proof technology available to humanity at this point in time. It has a proven track record and very minimal storage requirements. It is called 'paper.' Companies need to develop easy-to-use solutions that enable the printing of products that are attractive to this age group. The other answer might be to invest in robust, easy, and automated metadata tagging and for-pay cloud storage solutions that will allow today's college-aged photographers to share their photographs with future generations. All of this will not be possible without increased consumer education and the development of easy-to-use end-to-end solutions.

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