

**Title:** The Digital Brain: From Memory to Memory Card

**Abstract:**

As technology becomes increasingly pervasive throughout modern society and in our daily lives, it is not hard to imagine that this technology might be affecting our cognitive processes. My proposed senior honors thesis aims to explore how the act of taking photos affects our memory for the photographed object or event — a relevant issue today considering the ease with which our personal devices allow us to snap a picture at any given moment. Funding for my project would allow me to take the lead on an empirical research project of high theoretical and real-world importance. This experience would be an ideal preparation for my educational goal of attending graduate school in the area of Neuropsychology.

**Proposal:**

With the sudden rise of personal electronic devices over the past decade or so, it is clear that our lives have become increasingly intertwined and even somewhat dependent on these devices and the functions they serve. Researchers are becoming interested in how these technologies might be affecting our cognitive processes — specifically memory, and how the various options of information-outsourcing provided by these devices is changing the way we remember information. Take, for example, the simple act of taking a photo during a scenic vacation or special occasion such as a concert or sports game. The intent in taking that picture is the hope that it will help preserve the memory of that event, however, what if it is doing just the opposite?

Henkel (2013) suggests that there exists a photo-taking-impairment effect whereby taking photos of certain objects causes people to remember less about the object's details and context, as opposed to merely observing said object. In her study, participants were taken on a museum tour and told to observe certain objects and to take pictures of others. In either case, participants were given 30 seconds with each object — 20 seconds to look at the object, and the final 10 seconds to either take a photo of the object, or continue looking at it. Participants were tested the next day about which objects they saw and what details they could remember about these objects. Photographed objects were generally remembered less by participants, as were visual details about those objects — almost as if they relied on the camera to keep that memory for them.

Given the recent nature of this topic, there isn't yet an abundance of information regarding the extent of this photo-taking-impairment effect, nor the specific conditions under which it definitively exists or is counteracted. My study aims to extend the findings of Henkel's study by manipulating different variables that could shed more light on the photo-taking-impairment effect and potential boundaries.

First, we plan to add a time delay in between the observation/photo-taking period and the testing period in order to see how well memories for photographed versus observed objects are retained after one week as opposed to one day. Second, we plan to introduce the element of choice into the study. As in Henkel (2013) all participants will go on a guided museum tour. However, participants will be randomly assigned to one of two conditions — one in which they will have a choice which object to photograph vs. observe, and one in which they will be told which objects to photograph vs. observe. Participants will be given the same amount of time with each object whether or not it is an observed or photographed object. In both conditions, participants

will be instructed not to review the photos they took after taking them, so as to control for enhanced memory retention that can take place with repeated viewing of an object. Memory retention will then be tested a week later in the second session of the study.

With the addition of both the week-long time-delay and the element of choice, we hope to more closely simulate memory in real-life situations during which we would take pictures— an approach that has not yet been explored in this up-and-coming area of psychological research. In other words, when we take pictures of objects or events in our everyday lives, we generally choose those things or moments that spark our interest. Murty, DuBrow, and Davachi (2015) found, in a combined behavioral/neuroimaging study exploring the effects of choice and perceived agency on memory, that the opportunity to choose gives people a perceived sense of agency, resulting in significant enhancements in declarative memory. So giving our participants the option to choose the objects they will photograph should indicate a heightened interest in those objects, thereby making the memories of these objects potentially more salient than observed objects. Furthermore, we often put the pictures we take in real-life right into storage, to be saved for viewing at a later date. So, in extending the time-delay in our study, we are hoping to explore the real-world implications about the way that taking pictures might affect our long- term storage for the original object in memory. While the goal of this study is of course more exploratory than it is in finding a specific outcome, we do predict a choice-enhanced memory effect, where participants in the choice condition should have better overall memory for photographed images than those of participants in the no-choice condition.

Regarding the timeline toward completion of my study, this semester will be devoted to the planning and preparation of my study in which I will conduct the literature review, finalize the study design, and ultimately submit a proposal for IRB review. I will begin data collection in January, likely continuing through February. Data analysis and the subsequent write up will likely begin in March, reaching completion by the end of April.

Funding for my project would allow me to explore this new and exciting area of psychological research in a way that more closely resembles real-world scenarios, and therefore more accurately depicts the real-life implications. Furthermore, this opportunity to lead my own independent research study will be an invaluable experience in preparation for my plan to attend graduate school for a Ph.D. in Neuropsychology.

### **Budget:**

I would like to request a sum of \$2,568 to fund subject payment, supplies, 2016 EPA conference, and poster/printing costs:

#### **Subject payment (total): \$800**

40 participants will be recruited to partake in a two-session study design, with a week in between the sessions. We expect the two sessions to span about 90 minutes in total, as the first session where participants will be taken on a tour must be time-regulated for purposes of standardization. Because of the time commitment, as well as the higher level of involvement required of participants in comparison to the usual computer-based experiment, I would like to offer each participant \$20 in compensation for their time and effort.

#### **Supplies (total): \$150**

In order to ensure that the procedure is standardized, I would like to provide digital cameras with

which participants will take photos during the tour session. The cameras will have a display, so as to simulate the conditions under which people take pictures as accurately as possible in modern-day scenarios. Participants will be led in groups of 4, necessitating 4 digital cameras and the supplies needed for each:

- Digital cameras (\$25 per camera): \$100
  - Polaroid CAA-200LC 2MP CMOS Digital Camera with 1.44-Inch LCD Display
- Memory cards (\$10 per card): \$40
  - SanDisk 8GB Class 4 SDHC Memory Card
- Triple A batteries (2 needed per camera plus replacements): \$15
  - Duracell Coppertop AAA Alkaline Batteries, 20 Count

**Eastern Psychological Association Conference 2016 (NYC): \$1,518**

While my timeline is such that I will not have completed my study by the time of this conference (Thurs, March 3 - Sat, March 5), my advisor and I believe it would still be beneficial to attend the conference for the various presentations and opportunities for professional development that this conference will provide. I have broken down the costs below:

- 4 nights at Marriott Marquis NYC (conference hotel - \$277/night): \$1,108
- Parking (March 2-6): \$250
- Meals (\$40 per day/4 days): \$160

**Poster/Printing costs: \$100**

**Total requested cost: \$2,568**