

Intercultural Human-Photo Encounters: How Cultural Similarity Affects Perceiving and Tagging Photographs

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ABSTRACT

The increasing popularity of online photo sharing makes encountering photos from other cultures an increasingly common event online. We present an online study investigating how photos' cultural origins interact with people's cultural backgrounds to influence their feelings about and tagging of online photos. People tend to feel closer to photos from their own cultural background than to photos from other cultural backgrounds; however, they apply the same number of tags regardless of the photo's culture. This suggests that culture has different effects on emotional and cognitive processes around picture perception, and also suggests that culture is a salient factor to be accounted for in designing online photo sharing and tagging systems.

Keywords

Cultural difference, photographs, tagging, perception, reminiscence.

ACM Classification Keywords

H.5.4 [Hypertext/Hypermedia]: User Issues; H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

General Terms

Design, Experimentation, Human Factors.

INTRODUCTION

Photographs are artifacts that holistically capture and record events that people experience. These photographs often contain culturally-specific elements: people, places, ceremonies, objects, and monuments that belong primarily to one culture [10]. The ubiquity of such culture-laden photographs in both image search results and photo-centric social media such as Flickr raises questions about how people consume and perceive photos that are coherent or incoherent with their own cultural background. How would people read, feel and make sense of photos from a different culture? How do the cultural elements influence people's perceived emotional closeness and ability to tag these pictures? These are important questions to answer as social media transcend national boundaries and these intercultural people-photo encounters become more common.

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These photos are used for a number of purposes, including supporting personal memory and knowledge sharing. Differences in culture may affect how people can use these photographs. For example, a common assumption of online photo tagging systems is that people share the same understanding and interpretation of the photographs. Thus, tags assigned by one user are likely to support other users' finding and understanding of online photos. But photos with culturally specific elements challenge this universality assumption. For instance, Figure 1 shows a photograph of a wedding ceremony in India. An American who has never seen an Indian wedding ceremony would never tag this "marriage", and might not understand such a tag if it were applied. Likewise, interpretations of landmarks such as monuments and famous buildings may vary between cultures. An American seeing a photograph of the Washington Monument might think about a field trip or about patriotism, while someone from another culture might simply note its size.

In this paper we present results from a survey-based online study that investigates how people's cultural backgrounds and photos' cultural origins interact to shape people's feelings about and tagging of photographs. We found that the assumption of universality in tagging online photos did not hold. As one might expect, people feel a stronger association toward photos from their own cultural background than toward photos that do not. However, sharing the same cultural background as the photo did not affect people's tagging behavior as measured by number of tags applied. We suggest that culture is an especially salient factor when considering the emotional side of photo use that should be considered in the design of online photo sharing applications, and that further study is warranted to



Figure 1. A photograph depicting Indian marriage. This is an important moment in the ceremony, but to non-Indians, might not connote marriage at all.



Figure 2. The set of photographs shown to the participants. Monument (left panel), daily life (top right panel) and marriage (bottom right panel) categories are shown in the order of Indian, Chinese and American origin.

understand how culture affects tagging behavior in more subtle ways than just the amount of tagging [3].

BACKGROUND

Culture can be conceived as a shared system of emotions, concepts and practices among a community of people [1]. People from the same culture tend to agree upon what looks pretty, what tastes good, and what makes them happy. Our underlying hypothesis is that differences may emerge when cultures do not share these unspoken assumptions of how the content of photographs should be interpreted. This may affect common activities around photos online including sharing, reminiscence, tagging, and search.

Online Photos and Reminiscence

Sharing and reminiscing through photographs is a common and often social practice [2][9]. People share photographs with friends, family members, co-workers and even strangers both online and offline. People share photographs with family and friends to facilitate storytelling about personal experiences, travel, family and friends [9]. The same phenomenon exists in online photo sharing and reminiscence through online sharing of photographs is valued [4]. People also find meaning in photos they randomly encounter. The reason that these “anonymous” photos may support personal memory ties directly to culture—one’s memories may be triggered by photos that present objects, scenes, or meanings that are consistent with one’s construal or representation of the world [6]. That is, although a person is unlikely to have a memory of a randomly chosen wedding photo, it can trigger their memory of weddings they have seen or heard about.

Thus, online photos have great potential to support reminiscence. An open question is whether photos from different cultures would be useful tools for personal reminiscence and emotional support.

Online Photos and Tagging

Tagging photographs is a common practice in online photo sharing sites. These tags range from metadata such as date, place, people, and items in a photo, to context-specific tags that explain a particular person’s feelings or memories around the photo. These tags support many uses, including image retrieval, describing subjects in the photographs to friends and family, and increasing social presence in the image sharing community [8]. These tags are a form of

knowledge sharing, which is largely dependent on the way people perceive the photograph.

Culture affects perception of photos, which may have implications for photo interpretation and tagging. For example, when interpreting pictograms that depict human faces, Japanese focused on the outer appearance of the face, while Americans focused on the state of the mind expressed in the face [7]. Similarly, Chinese and Americans generate quite different sets of tags for the same photos, especially at the beginning of their tagging [3]. However, in these studies, the focus was mainly on the effects of people’s cultural backgrounds, not on how personal cultural backgrounds and photos’ cultural origins interact.

STUDY DESIGN

Our study investigates two main questions around the relationship between the cultural backgrounds of people and photographs.

RQ1: Do individuals’ cultural backgrounds and the cultural origins of the photos influence people’s feelings about and tagging of the photos?

RQ2: Does source of knowledge—that is, whether people interpret a photograph primarily based on personal or community experience, or based on learning about it through media—affect the way people perceive and tag photos?

Method

We designed an online survey consisting of a total of nine photos from various flickr users, three each from Indian, Chinese, and American cultures. For each culture, one photo depicted marriage, one a cultural-specific monument, and one a typical photo of daily life. Figure 2 shows the photographs shown to the participants. The survey presented each photo on a separate web page. For each photo, participants rated how attached they felt to the picture and assigned as many relevant keywords or short phrases to the picture as they could think of. The survey also asked how people came to know about the elements represented in the photos (e.g., “personal experience”, “learned from people I know”, and “learned from TV”).

Participants and Procedure

We recruited participants from Indian, Chinese, and American backgrounds by sending a recruiting message to mailing lists managed by cultural organizations at two different universities, one in the northeastern and one in the

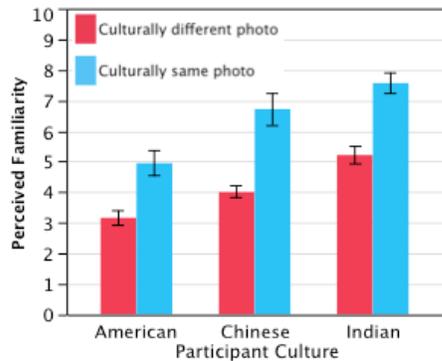


Figure 3. Perceived familiarity with photos from one’s own or a different cultural background.

southern United States. We recruited a total of thirty participants, ten from each cultural background. Backgrounds were verified with demographic questions (e.g., first language spoken, country of birth, and years living in the U.S.) All non-American participants had lived in the U.S. for less than 3 years.

Participants took the online survey remotely by visiting a website listed in the recruiting email. To reduce priming for cultural responses, we avoided any direct references to “culture” in the survey.

Measures

Perceived familiarity is measured by averaging the ratings on two survey items: “How strong are your feelings about this picture?” and “How close do you relate yourself to this photograph?” on a scale from 1 to 10 where 1 was “not close” and 10 was “very close”. The two items correlated strongly ($r=0.80$).

Number of tags is simply a count of how many tags a person provided on each photo. We considered phrases and short sentences as single tags. Some photos were tagged “None” and others had extended narratives; we counted these as having zero and one tag, respectively.

Knowledge source refers to how people came to know of the content represented in a photograph. The source is labeled as “community-based” when participants reported that the knowledge was from personal experience, family, community, or culture. The source is labeled as “media-based” when the acquisition of knowledge was mediated by technologies, such as TV, Internet or books. Sometimes people left this question blank; those responses are excluded from the analysis.

RESULTS

Cultural Differences in Familiarity and Tagging

Figure 3 shows that there was a main effect of participants’ cultural background on perceived familiarity, $F[2, 29]=10.25$, $p<.001$. Indians and Chinese gave overall higher familiarity ratings than Americans. However, this pattern may be confounded with cultural differences in the way people self-report and respond to surveys [5]. For all three cultures, people felt a higher degree of perceived

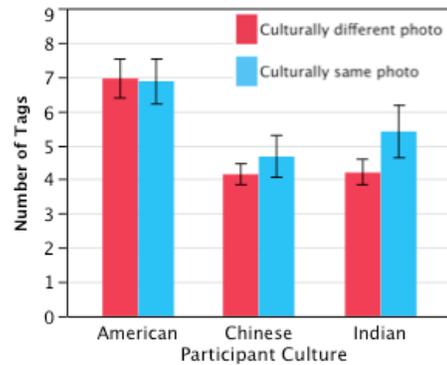


Figure 4. Number of tags assigned to photos from one’s own or a different cultural background.

familiarity to pictures from the same culture than to pictures from other cultures, $F[1, 237]=89$, $p<.0001$.

Figure 4 shows that although Americans tended to generate more tags than participants from other cultures, the difference was not significant after controlling for within-subject correlations with mixed-model ANOVA, $F[2, 27]=1.94$, *ns*. There were some differences in how many tags people assigned to photos based on whether the photo came from their own or a different culture; in particular, Indians assigned more tags to culturally similar photos than culturally different ones (by mixed-model ANOVA and contrast analyses, $F[1, 237]=7.46$, $p<.01$).

Overall, with respect to RQ1, we identified that the patterns of perceived similarity and tagging of photos do vary between cultures, and also vary depending on whether a photo comes from a person’s own cultural background. The effects seem to be much stronger in terms of perceived closeness than number of tags.

Sources of Knowledge

We now turn to whether the way people learned about a photo affects their perceived closeness to it or ability to tag it. As one might expect, the majority of cultural knowledge about photos from different cultures was mediated by technologies (62.8% from media, 28.9% from community), while people tended to learn about items from the same culture through community (13.3% from media, 85.5% from community). These breakdowns were roughly the same for Indian, Chinese, and American participants.

Figure 5 shows that people perceived themselves to be much closer to photos when the source of knowledge was community-based than when it was media-based in all three cultures, $F[1, 235]=91.79$, $p<.0001$. The difference between the means of different knowledge sources (e.g., community or media) was about 1 standard deviation (0.98 SD), which is considered as a large effect size.

As depicted in Figure 6, Indians and Chinese applied slightly more tags to photos learned from community than media (mixed-model ANOVA followed by post-hoc t-tests, for Indians, $t[223]=2.07$, $p<.05$, for Chinese, $t[223]=2.1$, $p<.05$). However, the differences between the means of

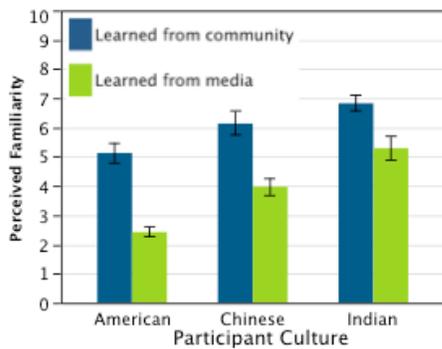


Figure 5. Perceived familiarity with photos by source of knowledge and personal cultural background.

different knowledge sources were small ones (0.30 SD for Indians and 0.18 SD for Chinese). Americans did not differ on number of tags applied between different knowledge sources, $t[223] = .58, ns$.

With respect to RQ2, sources of knowledge influence how photos are perceived, but again the effect on perceived closeness is much stronger than the number of tags.

DISCUSSION AND FUTURE WORK

The culture of the person and the culture of the photograph jointly shape how photos are perceived and tagged. It is interesting that the emotional aspect of photo use, in terms of perceived familiarity, seems to be more influenced by cultural factors than the conceptual aspect of use, as measured by amount of tagging—though [3] showed that Chinese and Americans apply different tags to the same photos, and this warrants further study.

With respect to how people learn about photos, although mediated knowledge seems to be sufficient for tagging, it did not support perceived familiarity as well as knowledge that came from one's own community. This again suggests a distinction between emotional and conceptual aspects of photo use, and merits more investigation.

One design implication is on the use of photos as a means to support reminiscence [9] and thinking activities, such as brainstorming for ideas [11]. Because cultural factors influence one's feeling about and (to some extent) tagging of photos, richer user profiling that accounts for cultural backgrounds and explicit consideration of the cultural background of photographs may be useful in designing more effective systems.

The current paper represents an early step in exploring how the cultural background of people and photos interact. We believe that this is a rich research space, important both for the theoretical aspects around understanding how culture shapes our interaction with the world, and for the design of photo sharing services and social media. Our future work includes a more qualitative look at how cultural background shapes the way people tag and tell stories around culture-laden photos, with the hope of eventually using photographs as one way to promote awareness and understanding of other cultures as well as to help develop intercultural trust and collaboration.

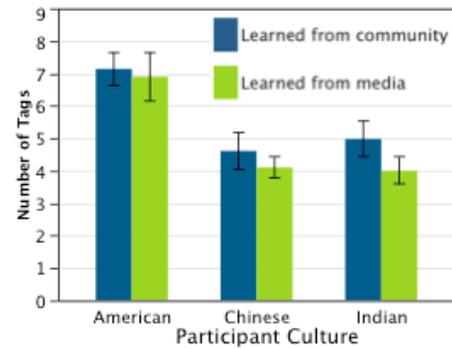


Figure 6. Number of tags by source of knowledge and personal cultural background.

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REFERENCES

1. Brumann, C. (1999). Writing for culture: Why a successful concept should not be discarded. *Curr. Anthropol.*, 40, 1–27.
2. Chalfen, R. (1987). *Snapshot versions of life*. Bowling Green State University Press.
3. Dong, W., & Fu, W.-T. (2010). Cultural difference in image tagging. In *Proc CHI 10* (pp. 981-984).
4. Frohlich, D., Kuchinsky, A., Pering, C., Don, A., & Ariss, S. (2002). Requirements for photoware. *Proc CSCW 02*.
5. Hamamura, T., Heine, S. J., & Paulhus, D. L. (2008). Cultural differences in response styles: The role of dialectical thinking. *Pers. Individ. Diff.*, 44, 932-942.
6. Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psych. Rev.*, 98, 224-253.
7. Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psych. Rev.*, 108, 291-310.
8. Nov, O. N., Naaman, M., & Ye, C. (2008). What drives content tagging: the case of photos on Flickr. *CHI 08*.
9. Peesapati, S. T., Schwanda, V., Schultz, J., Lepage, M., Jeong, S., & Cosley, D. (2010). Pensieve: supporting everyday reminiscence. *Proc CHI 10*.
10. Van House, N., Davis, M., Ames, M., Finn, M., & Viswanathan, V. (2005). The uses of personal net-worked digital imaging: an empirical study of cameraphone photos and sharing. *Ext. Abstracts CHI 05*.
11. Wang, H.-C., Cosley, D., & Fussell, S. R. (2010). Idea expander: Supporting group brainstorming with conversationally triggered visual thinking stimuli. *Proc CSCW 10*.